Attachment A

Air Quality Technical Documents

ESA

A-1 CalEEMod Outputs

River Oaks Marketplace

Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.24	Acre	3.24	141,134.40	0
Parking Lot	109.00	Space	0.98	43,600.00	0
Fast Food Restaurant with Drive Thru	4.50	1000sqft	0.10	4,500.00	0
Fast Food Restaurant with Drive Thru	0.88	1000sqft	0.02	880.00	0
Convenience Market With Gas Pumps	4.65	1000sqft	0.11	4,650.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assume power is SMUD

Land Use - based on RFI

Construction Phase - based on RFI

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Arch coat only

Off-road Equipment -

Grading - acre graded based on entire site size

Trips and VMT - from RFI or default if unknown

Vehicle Trips - NO VMT complete because the project size is exempt from CEQA VMT analysis. Trips based on traffic memo

Construction Off-road Equipment Mitigation - No Haul trucks. BMPs require twice daily watering. Tier 4 Final ran, if applicable

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	18.00	34.00
tblConstructionPhase	NumDays	230.00	102.00
tblConstructionPhase	NumDays	5.00	48.00
tblConstructionPhase	NumDays	18.00	47.00
tblConstructionPhase	NumDays	8.00	48.00
tblConstructionPhase	PhaseEndDate	6/7/2022	6/1/2022
tblConstructionPhase	PhaseEndDate	4/18/2022	3/23/2022
tblConstructionPhase	PhaseEndDate	5/12/2021	6/21/2021
tblConstructionPhase	PhaseEndDate	5/31/2021	11/1/2021
tblConstructionPhase	PhaseEndDate	5/12/2022	4/15/2022
tblConstructionPhase	PhaseEndDate	5/19/2021	8/26/2021
tblConstructionPhase	PhaseStartDate	5/13/2022	4/15/2022
tblConstructionPhase	PhaseStartDate	6/1/2021	11/2/2021

tblConstructionPhase	PhaseStartDate	5/20/2021	8/27/2021
tblConstructionPhase	PhaseStartDate	4/19/2022	3/23/2022
tblConstructionPhase	PhaseStartDate	5/13/2021	6/22/2021
tblGrading	AcresOfGrading	24.00	5.23
tblTripsAndVMT	WorkerTripNumber	18.00	40.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	20.00	40.00
tblTripsAndVMT	WorkerTripNumber	81.00	80.00
tblVehicleTrips	ST_TR	1,448.33	914.62
tblVehicleTrips	ST_TR	722.03	727.14
tblVehicleTrips	SU_TR	1,182.08	914.62
tblVehicleTrips	SU_TR	542.72	727.14
tblVehicleTrips	WD_TR	845.60	914.62
tblVehicleTrips	WD_TR	496.12	727.14

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.2396	2.2863	1.6772	3.1500e-003	0.6189	0.1120	0.7310	0.3283	0.1035	0.4318	0.0000	277.7651	277.7651	0.0723	0.0000	279.5717
2022	0.1574	0.7233	0.7868	1.5400e-003	0.0260	0.0329	0.0589	7.0400e-003	0.0308	0.0379	0.0000	135.9149	135.9149	0.0266	0.0000	136.5804
Maximum	**0.2396**	**2.2863**	**1.6772**	**3.1500e-003**	**0.6189**	**0.1120**	**0.7310**	**0.3283**	**0.1035**	**0.4318**	**0.0000**	**277.7651**	**277.7651**	**0.0723**	**0.0000**	**279.5717**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0560	0.2402	1.7652	3.1500e-003	0.2995	4.6700e-003	0.3041	0.1534	4.6500e-003	0.1580	0.0000	277.7648	277.7648	0.0723	0.0000	279.5714
2022	0.1030	0.1780	0.8415	1.5400e-003	0.0260	2.0900e-003	0.0281	7.0400e-003	2.0700e-003	9.1100e-003	0.0000	135.9148	135.9148	0.0266	0.0000	136.5803
Maximum	**0.1030**	**0.2402**	**1.7652**	**3.1500e-003**	**0.2995**	**4.6700e-003**	**0.3041**	**0.1534**	**4.6500e-003**	**0.1580**	**0.0000**	**277.7648**	**277.7648**	**0.0723**	**0.0000**	**279.5714**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**59.95**	**86.11**	**-5.79**	**0.00**	**49.54**	**95.33**	**57.94**	**52.17**	**95.00**	**64.42**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-15-2021**	**7-14-2021**	1.3078	0.0841
2	**7-15-2021**	**10-14-2021**	0.6360	0.0623
3	**10-15-2021**	**1-14-2022**	0.6819	0.1796
4	**1-15-2022**	**4-14-2022**	0.5893	0.2189
5	**4-15-2022**	**7-14-2022**	0.1909	0.0305
		Highest	1.3078	0.2189

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0585	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003
Energy	5.2900e-003	0.0481	0.0404	2.9000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	130.9391	130.9391	4.8600e-003	1.7600e-003	131.5848
Mobile	1.7178	5.7905	11.1571	0.0231	1.6370	0.0248	1.6618	0.4389	0.0231	0.4620	0.0000	2,123.8396	2,123.8396	0.1478	0.0000	2,127.5343
Waste						0.0000	0.0000		0.0000	0.0000	15.4151	0.0000	15.4151	0.9110	0.0000	38.1903
Water						0.0000	0.0000		0.0000	0.0000	0.6996	2.9337	3.6334	2.5500e-003	1.5500e-003	4.1594
Total	**1.7816**	**5.8386**	**11.1991**	**0.0234**	**1.6370**	**0.0284**	**1.6654**	**0.4389**	**0.0268**	**0.4657**	**16.1148**	**2,257.7154**	**2,273.8302**	**1.0662**	**3.3100e-003**	**2,301.4721**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0585	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003
Energy	5.2900e-003	0.0481	0.0404	2.9000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	130.9391	130.9391	4.8600e-003	1.7600e-003	131.5848
Mobile	1.7178	5.7905	11.1571	0.0231	1.6370	0.0248	1.6618	0.4389	0.0231	0.4620	0.0000	2,123.8396	2,123.8396	0.1478	0.0000	2,127.5343
Waste						0.0000	0.0000		0.0000	0.0000	15.4151	0.0000	15.4151	0.9110	0.0000	38.1903
Water						0.0000	0.0000		0.0000	0.0000	0.6996	2.9337	3.6334	2.5500e-003	1.5500e-003	4.1594
Total	**1.7816**	**5.8386**	**11.1991**	**0.0234**	**1.6370**	**0.0284**	**1.6654**	**0.4389**	**0.0268**	**0.4657**	**16.1148**	**2,257.7154**	**2,273.8302**	**1.0662**	**3.3100e-003**	**2,301.4721**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Period 1a	Site Preparation	4/15/2021	6/21/2021	5	48	
2	Period 1b	Grading	6/22/2021	8/26/2021	5	48	
3	Period 1c	Paving	8/27/2021	11/1/2021	5	47	
4	Period 2a	Building Construction	11/2/2021	3/23/2022	5	102	
5	Period 2b	Architectural Coating	3/23/2022	4/15/2022	5	18	
6	Period 3	Paving	4/15/2022	6/1/2022	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,045; Non-Residential Outdoor: 5,015; Striped Parking Area: 11,084 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Period 3	Air Compressors	0	0.00	78	0.48
Period 2b	Cement and Mortar Mixers	0	0.00	9	0.56
Period 1a	Concrete/Industrial Saws	0		81	0.73
Period 1a	Excavators	0		158	0.38
Period 2a	Cranes	1	7.00	231	0.29
Period 2a	Forklifts	3	8.00	89	0.20
Period 1c	Excavators	0	0.00	158	0.38
Period 2b	Pavers	0	0.00	130	0.42
Period 2b	Rollers	0	0.00	80	0.38
Period 1a	Rubber Tired Dozers	3	8.00	247	0.40

Period 1c	Rubber Tired Dozers	0	0.00	247	0.40
Period 2a	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Period 2a	Generator Sets	1	8.00	84	0.74
Period 1c	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 2b	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Period 1b	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Period 1c	Graders	0	0.00	187	0.41
Period 2b	Paving Equipment	0	0.00	132	0.36
Period 1b	Rubber Tired Dozers	1	8.00	247	0.40
Period 2a	Welders	1	8.00	46	0.45
Period 2b	Air Compressors	1	6.00	78	0.48
Period 1c	Cement and Mortar Mixers	2	6.00	9	0.56
Period 3	Cement and Mortar Mixers	2	6.00	9	0.56
Period 1b	Excavators	1	8.00	158	0.38
Period 1b	Graders	1	8.00	187	0.41
Period 1c	Pavers	1	8.00	130	0.42
Period 3	Pavers	1	8.00	130	0.42
Period 1c	Paving Equipment	2	6.00	132	0.36
Period 3	Paving Equipment	2	6.00	132	0.36
Period 1c	Rollers	2	6.00	80	0.38
Period 3	Rollers	2	6.00	80	0.38
Period 3	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 1a	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Period 1a	7	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1b	6	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1c	8	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2a	9	80.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2b	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 3	8	20.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Period 1a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4336	0.0000	0.4336	0.2383	0.0000	0.2383	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0933	0.9719	0.5077	9.1000e-004		0.0491	0.0491		0.0451	0.0451	0.0000	80.2457	80.2457	0.0260	0.0000	80.8946
Total	**0.0933**	**0.9719**	**0.5077**	**9.1000e-004**	**0.4336**	**0.0491**	**0.4827**	**0.2383**	**0.0451**	**0.2835**	**0.0000**	**80.2457**	**80.2457**	**0.0260**	**0.0000**	**80.8946**

3.2 Period 1a - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3200e-003	2.1700e-003	0.0243	7.0000e-005	7.0500e-003	5.0000e-005	7.1000e-003	1.8800e-003	5.0000e-005	1.9200e-003	0.0000	6.0344	6.0344	1.6000e-004	0.0000	6.0383
Total	**3.3200e-003**	**2.1700e-003**	**0.0243**	**7.0000e-005**	**7.0500e-003**	**5.0000e-005**	**7.1000e-003**	**1.8800e-003**	**5.0000e-005**	**1.9200e-003**	**0.0000**	**6.0344**	**6.0344**	**1.6000e-004**	**0.0000**	**6.0383**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1951	0.0000	0.1951	0.1073	0.0000	0.1073	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.0484	0.5009	9.1000e-004		1.4900e-003	1.4900e-003		1.4900e-003	1.4900e-003	0.0000	80.2456	80.2456	0.0260	0.0000	80.8945
Total	**0.0112**	**0.0484**	**0.5009**	**9.1000e-004**	**0.1951**	**1.4900e-003**	**0.1966**	**0.1073**	**1.4900e-003**	**0.1087**	**0.0000**	**80.2456**	**80.2456**	**0.0260**	**0.0000**	**80.8945**

3.2 Period 1a - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3200e-003	2.1700e-003	0.0243	7.0000e-005	7.0500e-003	5.0000e-005	7.1000e-003	1.8800e-003	5.0000e-005	1.9200e-003	0.0000	6.0344	6.0344	1.6000e-004	0.0000	6.0383
Total	**3.3200e-003**	**2.1700e-003**	**0.0243**	**7.0000e-005**	**7.0500e-003**	**5.0000e-005**	**7.1000e-003**	**1.8800e-003**	**5.0000e-005**	**1.9200e-003**	**0.0000**	**6.0344**	**6.0344**	**1.6000e-004**	**0.0000**	**6.0383**

3.3 Period 1b - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1473	0.0000	0.1473	0.0797	0.0000	0.0797	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0550	0.5937	0.3806	7.1000e-004		0.0278	0.0278		0.0256	0.0256	0.0000	62.5289	62.5289	0.0202	0.0000	63.0345
Total	**0.0550**	**0.5937**	**0.3806**	**7.1000e-004**	**0.1473**	**0.0278**	**0.1751**	**0.0797**	**0.0256**	**0.1054**	**0.0000**	**62.5289**	**62.5289**	**0.0202**	**0.0000**	**63.0345**

3.3 Period 1b - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3200e-003	2.1700e-003	0.0243	7.0000e-005	7.0500e-003	5.0000e-005	7.1000e-003	1.8800e-003	5.0000e-005	1.9200e-003	0.0000	6.0344	6.0344	1.6000e-004	0.0000	6.0383
Total	**3.3200e-003**	**2.1700e-003**	**0.0243**	**7.0000e-005**	**7.0500e-003**	**5.0000e-005**	**7.1000e-003**	**1.8800e-003**	**5.0000e-005**	**1.9200e-003**	**0.0000**	**6.0344**	**6.0344**	**1.6000e-004**	**0.0000**	**6.0383**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0663	0.0000	0.0663	0.0359	0.0000	0.0359	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.7200e-003	0.0378	0.4261	7.1000e-004		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	62.5288	62.5288	0.0202	0.0000	63.0344
Total	**8.7200e-003**	**0.0378**	**0.4261**	**7.1000e-004**	**0.0663**	**1.1600e-003**	**0.0675**	**0.0359**	**1.1600e-003**	**0.0371**	**0.0000**	**62.5288**	**62.5288**	**0.0202**	**0.0000**	**63.0344**

3.3 Period 1b - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3200e-003	2.1700e-003	0.0243	7.0000e-005	7.0500e-003	5.0000e-005	7.1000e-003	1.8800e-003	5.0000e-005	1.9200e-003	0.0000	6.0344	6.0344	1.6000e-004	0.0000	6.0383
Total	**3.3200e-003**	**2.1700e-003**	**0.0243**	**7.0000e-005**	**7.0500e-003**	**5.0000e-005**	**7.1000e-003**	**1.8800e-003**	**5.0000e-005**	**1.9200e-003**	**0.0000**	**6.0344**	**6.0344**	**1.6000e-004**	**0.0000**	**6.0383**

3.4 Period 1c - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0257	0.2547	0.2881	4.4000e-004		0.0136	0.0136		0.0126	0.0126	0.0000	38.4710	38.4710	0.0121	0.0000	38.7732
Paving	5.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0312**	**0.2547**	**0.2881**	**4.4000e-004**		**0.0136**	**0.0136**		**0.0126**	**0.0126**	**0.0000**	**38.4710**	**38.4710**	**0.0121**	**0.0000**	**38.7732**

3.4 Period 1c - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2500e-003	2.1300e-003	0.0238	7.0000e-005	6.9000e-003	5.0000e-005	6.9500e-003	1.8400e-003	4.0000e-005	1.8800e-003	0.0000	5.9086	5.9086	1.6000e-004	0.0000	5.9125
Total	**3.2500e-003**	**2.1300e-003**	**0.0238**	**7.0000e-005**	**6.9000e-003**	**5.0000e-005**	**6.9500e-003**	**1.8400e-003**	**4.0000e-005**	**1.8800e-003**	**0.0000**	**5.9086**	**5.9086**	**1.6000e-004**	**0.0000**	**5.9125**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.1600e-003	0.0224	0.3180	4.4000e-004		6.9000e-004	6.9000e-004		6.9000e-004	6.9000e-004	0.0000	38.4709	38.4709	0.0121	0.0000	38.7731
Paving	5.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0107**	**0.0224**	**0.3180**	**4.4000e-004**		**6.9000e-004**	**6.9000e-004**		**6.9000e-004**	**6.9000e-004**	**0.0000**	**38.4709**	**38.4709**	**0.0121**	**0.0000**	**38.7731**

3.4 Period 1c - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2500e-003	2.1300e-003	0.0238	7.0000e-005	6.9000e-003	5.0000e-005	6.9500e-003	1.8400e-003	4.0000e-005	1.8800e-003	0.0000	5.9086	5.9086	1.6000e-004	0.0000	5.9125
Total	**3.2500e-003**	**2.1300e-003**	**0.0238**	**7.0000e-005**	**6.9000e-003**	**5.0000e-005**	**6.9500e-003**	**1.8400e-003**	**4.0000e-005**	**1.8800e-003**	**0.0000**	**5.9086**	**5.9086**	**1.6000e-004**	**0.0000**	**5.9125**

3.5 Period 2a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0418	0.3835	0.3647	5.9000e-004		0.0211	0.0211		0.0198	0.0198	0.0000	50.9602	50.9602	0.0123	0.0000	51.2676
Total	**0.0418**	**0.3835**	**0.3647**	**5.9000e-004**		**0.0211**	**0.0211**		**0.0198**	**0.0198**	**0.0000**	**50.9602**	**50.9602**	**0.0123**	**0.0000**	**51.2676**

3.5 Period 2a - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2100e-003	0.0720	0.0193	1.7000e-004	4.1200e-003	2.0000e-004	4.3100e-003	1.1900e-003	1.9000e-004	1.3800e-003	0.0000	16.5190	16.5190	9.4000e-004	0.0000	16.5426
Worker	6.0900e-003	3.9800e-003	0.0446	1.2000e-004	0.0129	9.0000e-005	0.0130	3.4400e-003	8.0000e-005	3.5200e-003	0.0000	11.0630	11.0630	2.9000e-004	0.0000	11.0703
Total	**8.3000e-003**	**0.0760**	**0.0638**	**2.9000e-004**	**0.0171**	**2.9000e-004**	**0.0173**	**4.6300e-003**	**2.7000e-004**	**4.9000e-003**	**0.0000**	**27.5820**	**27.5820**	**1.2300e-003**	**0.0000**	**27.6128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2100e-003	0.0492	0.3841	5.9000e-004		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	50.9601	50.9601	0.0123	0.0000	51.2675
Total	**7.2100e-003**	**0.0492**	**0.3841**	**5.9000e-004**		**9.0000e-004**	**9.0000e-004**		**9.0000e-004**	**9.0000e-004**	**0.0000**	**50.9601**	**50.9601**	**0.0123**	**0.0000**	**51.2675**

3.5 Period 2a - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2100e-003	0.0720	0.0193	1.7000e-004	4.1200e-003	2.0000e-004	4.3100e-003	1.1900e-003	1.9000e-004	1.3800e-003	0.0000	16.5190	16.5190	9.4000e-004	0.0000	16.5426
Worker	6.0900e-003	3.9800e-003	0.0446	1.2000e-004	0.0129	9.0000e-005	0.0130	3.4400e-003	8.0000e-005	3.5200e-003	0.0000	11.0630	11.0630	2.9000e-004	0.0000	11.0703
Total	**8.3000e-003**	**0.0760**	**0.0638**	**2.9000e-004**	**0.0171**	**2.9000e-004**	**0.0173**	**4.6300e-003**	**2.7000e-004**	**4.9000e-003**	**0.0000**	**27.5820**	**27.5820**	**1.2300e-003**	**0.0000**	**27.6128**

3.5 Period 2a - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0495	0.4529	0.4745	7.8000e-004		0.0235	0.0235		0.0221	0.0221	0.0000	67.2003	67.2003	0.0161	0.0000	67.6028
Total	**0.0495**	**0.4529**	**0.4745**	**7.8000e-004**		**0.0235**	**0.0235**		**0.0221**	**0.0221**	**0.0000**	**67.2003**	**67.2003**	**0.0161**	**0.0000**	**67.6028**

3.5 Period 2a - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7100e-003	0.0901	0.0234	2.2000e-004	5.4200e-003	2.3000e-004	5.6600e-003	1.5700e-003	2.2000e-004	1.7900e-003	0.0000	21.5836	21.5836	1.2100e-003	0.0000	21.6139
Worker	7.5100e-003	4.7200e-003	0.0540	1.6000e-004	0.0170	1.2000e-004	0.0172	4.5300e-003	1.1000e-004	4.6400e-003	0.0000	14.0607	14.0607	3.4000e-004	0.0000	14.0693
Total	**0.0102**	**0.0949**	**0.0774**	**3.8000e-004**	**0.0225**	**3.5000e-004**	**0.0228**	**6.1000e-003**	**3.3000e-004**	**6.4300e-003**	**0.0000**	**35.6443**	**35.6443**	**1.5500e-003**	**0.0000**	**35.6831**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.5100e-003	0.0648	0.5064	7.8000e-004		1.1800e-003	1.1800e-003		1.1800e-003	1.1800e-003	0.0000	67.2002	67.2002	0.0161	0.0000	67.6027
Total	**9.5100e-003**	**0.0648**	**0.5064**	**7.8000e-004**		**1.1800e-003**	**1.1800e-003**		**1.1800e-003**	**1.1800e-003**	**0.0000**	**67.2002**	**67.2002**	**0.0161**	**0.0000**	**67.6027**

3.5 Period 2a - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7100e-003	0.0901	0.0234	2.2000e-004	5.4200e-003	2.3000e-004	5.6600e-003	1.5700e-003	2.2000e-004	1.7900e-003	0.0000	21.5836	21.5836	1.2100e-003	0.0000	21.6139
Worker	7.5100e-003	4.7200e-003	0.0540	1.6000e-004	0.0170	1.2000e-004	0.0172	4.5300e-003	1.1000e-004	4.6400e-003	0.0000	14.0607	14.0607	3.4000e-004	0.0000	14.0693
Total	**0.0102**	**0.0949**	**0.0774**	**3.8000e-004**	**0.0225**	**3.5000e-004**	**0.0228**	**6.1000e-003**	**3.3000e-004**	**6.4300e-003**	**0.0000**	**35.6443**	**35.6443**	**1.5500e-003**	**0.0000**	**35.6831**

3.6 Period 2b - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0722					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8400e-003	0.0127	0.0163	3.0000e-005		7.4000e-004	7.4000e-004		7.4000e-004	7.4000e-004	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**0.0740**	**0.0127**	**0.0163**	**3.0000e-005**		**7.4000e-004**	**7.4000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 Period 2b - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.7000e-004	2.9000e-004	3.3500e-003	1.0000e-005	1.0600e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8727	0.8727	2.0000e-005	0.0000	0.8733
Total	**4.7000e-004**	**2.9000e-004**	**3.3500e-003**	**1.0000e-005**	**1.0600e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8727**	**0.8727**	**2.0000e-005**	**0.0000**	**0.8733**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0722					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	1.1600e-003	0.0165	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**0.0725**	**1.1600e-003**	**0.0165**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 Period 2b - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.7000e-004	2.9000e-004	3.3500e-003	1.0000e-005	1.0600e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8727	0.8727	2.0000e-005	0.0000	0.8733
Total	**4.7000e-004**	**2.9000e-004**	**3.3500e-003**	**1.0000e-005**	**1.0600e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8727**	**0.8727**	**2.0000e-005**	**0.0000**	**0.8733**

3.7 Period 3 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0166	0.1619	0.2073	3.2000e-004		8.2900e-003	8.2900e-003		7.6600e-003	7.6600e-003	0.0000	27.8390	27.8390	8.7500e-003	0.0000	28.0576
Paving	5.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0221**	**0.1619**	**0.2073**	**3.2000e-004**		**8.2900e-003**	**8.2900e-003**		**7.6600e-003**	**7.6600e-003**	**0.0000**	**27.8390**	**27.8390**	**8.7500e-003**	**0.0000**	**28.0576**

3.7 Period 3 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	6.9000e-004	7.9100e-003	2.0000e-005	2.5000e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0606	2.0606	5.0000e-005	0.0000	2.0619
Total	**1.1000e-003**	**6.9000e-004**	**7.9100e-003**	**2.0000e-005**	**2.5000e-003**	**2.0000e-005**	**2.5100e-003**	**6.6000e-004**	**2.0000e-005**	**6.8000e-004**	**0.0000**	**2.0606**	**2.0606**	**5.0000e-005**	**0.0000**	**2.0619**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7300e-003	0.0162	0.2301	3.2000e-004		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	27.8389	27.8389	8.7500e-003	0.0000	28.0576
Paving	5.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.2600e-003**	**0.0162**	**0.2301**	**3.2000e-004**		**5.0000e-004**	**5.0000e-004**		**5.0000e-004**	**5.0000e-004**	**0.0000**	**27.8389**	**27.8389**	**8.7500e-003**	**0.0000**	**28.0576**

3.7 Period 3 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	6.9000e-004	7.9100e-003	2.0000e-005	2.5000e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0606	2.0606	5.0000e-005	0.0000	2.0619
Total	**1.1000e-003**	**6.9000e-004**	**7.9100e-003**	**2.0000e-005**	**2.5000e-003**	**2.0000e-005**	**2.5100e-003**	**6.6000e-004**	**2.0000e-005**	**6.8000e-004**	**0.0000**	**2.0606**	**2.0606**	**5.0000e-005**	**0.0000**	**2.0619**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.7178	5.7905	11.1571	0.0231	1.6370	0.0248	1.6618	0.4389	0.0231	0.4620	0.0000	2,123.8396	2,123.8396	0.1478	0.0000	2,127.5343
Unmitigated	1.7178	5.7905	11.1571	0.0231	1.6370	0.0248	1.6618	0.4389	0.0231	0.4620	0.0000	2,123.8396	2,123.8396	0.1478	0.0000	2,127.5343

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	4,252.98	4,252.98	4252.98	1,687,510	1,687,510
Fast Food Restaurant with Drive Thru	3,272.13	3,272.13	3272.13	2,260,370	2,260,370
Fast Food Restaurant with Drive Thru	639.88	639.88	639.88	442,028	442,028
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	8,165.00	8,165.00	8,165.00	4,389,908	4,389,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	10.00	5.00	6.50	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Other Asphalt Surfaces	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Fast Food Restaurant with Drive Thru	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Other Asphalt Surfaces	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Parking Lot	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	78.5770	78.5770	3.8600e-003	8.0000e-004	78.9115
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	78.5770	78.5770	3.8600e-003	8.0000e-004	78.9115
NaturalGas Mitigated	5.2900e-003	0.0481	0.0404	2.9000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	52.3621	52.3621	1.0000e-003	9.6000e-004	52.6733
NaturalGas Unmitigated	5.2900e-003	0.0481	0.0404	2.9000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	52.3621	52.3621	1.0000e-003	9.6000e-004	52.6733

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	25203	1.4000e-004	1.2400e-003	1.0400e-003	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3449	1.3449	3.0000e-005	2.0000e-005	1.3529
Fast Food Restaurant with Drive Thru	156376	8.4000e-004	7.6700e-003	6.4400e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3448	8.3448	1.6000e-004	1.5000e-004	8.3944
Fast Food Restaurant with Drive Thru	799650	4.3100e-003	0.0392	0.0329	2.4000e-004		2.9800e-003	2.9800e-003		2.9800e-003	2.9800e-003	0.0000	42.6724	42.6724	8.2000e-004	7.8000e-004	42.9260
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.2900e-003**	**0.0481**	**0.0404**	**3.0000e-004**		**3.6500e-003**	**3.6500e-003**		**3.6500e-003**	**3.6500e-003**	**0.0000**	**52.3621**	**52.3621**	**1.0100e-003**	**9.5000e-004**	**52.6733**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	25203	1.4000e-004	1.2400e-003	1.0400e-003	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3449	1.3449	3.0000e-005	2.0000e-005	1.3529
Fast Food Restaurant with Drive Thru	799650	4.3100e-003	0.0392	0.0329	2.4000e-004		2.9800e-003	2.9800e-003		2.9800e-003	2.9800e-003	0.0000	42.6724	42.6724	8.2000e-004	7.8000e-004	42.9260
Fast Food Restaurant with Drive Thru	156376	8.4000e-004	7.6700e-003	6.4400e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3448	8.3448	1.6000e-004	1.5000e-004	8.3944
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.2900e-003**	**0.0481**	**0.0404**	**3.0000e-004**		**3.6500e-003**	**3.6500e-003**		**3.6500e-003**	**3.6500e-003**	**0.0000**	**52.3621**	**52.3621**	**1.0100e-003**	**9.5000e-004**	**52.6733**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	53800.5	14.4056	7.1000e-004	1.5000e-004	14.4670
Fast Food Restaurant with Drive Thru	187695	50.2572	2.4700e-003	5.1000e-004	50.4712
Fast Food Restaurant with Drive Thru	36704.8	9.8281	4.8000e-004	1.0000e-004	9.8699
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	15260	4.0860	2.0000e-004	4.0000e-005	4.1034
Total		**78.5770**	**3.8600e-003**	**8.0000e-004**	**78.9115**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	53800.5	14.4056	7.1000e-004	1.5000e-004	14.4670
Fast Food Restaurant with Drive Thru	187695	50.2572	2.4700e-003	5.1000e-004	50.4712
Fast Food Restaurant with Drive Thru	36704.8	9.8281	4.8000e-004	1.0000e-004	9.8699
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	15260	4.0860	2.0000e-004	4.0000e-005	4.1034
Total		**78.5770**	**3.8600e-003**	**8.0000e-004**	**78.9115**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0585	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003
Unmitigated	0.0585	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	7.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0511					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.5000e-004	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003
Total	**0.0585**	**1.0000e-005**	**1.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.0300e-003**	**3.0300e-003**	**1.0000e-005**	**0.0000**	**3.2300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	7.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0511					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.5000e-004	1.0000e-005	1.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.0300e-003	3.0300e-003	1.0000e-005	0.0000	3.2300e-003
Total	**0.0585**	**1.0000e-005**	**1.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.0300e-003**	**3.0300e-003**	**1.0000e-005**	**0.0000**	**3.2300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.6334	2.5500e-003	1.5500e-003	4.1594
Unmitigated	3.6334	2.5500e-003	1.5500e-003	4.1594

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.344437 / 0.211107	0.7792	4.5000e-004	2.7000e-004	0.8715
Fast Food Restaurant with Drive Thru	1.63301 / 0.104235	2.8541	2.1000e-003	1.2800e-003	3.2879
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.6333**	**2.5500e-003**	**1.5500e-003**	**4.1594**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.344437 / 0.211107	0.7792	4.5000e-004	2.7000e-004	0.8715
Fast Food Restaurant with Drive Thru	1.63301 / 0.104235	2.8541	2.1000e-003	1.2800e-003	3.2879
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.6333**	**2.5500e-003**	**1.5500e-003**	**4.1594**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.4151	0.9110	0.0000	38.1903
Unmitigated	15.4151	0.9110	0.0000	38.1903

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	13.97	2.8358	0.1676	0.0000	7.0255
Fast Food Restaurant with Drive Thru	61.97	12.5794	0.7434	0.0000	31.1648
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.4151**	**0.9110**	**0.0000**	**38.1903**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	13.97	2.8358	0.1676	0.0000	7.0255
Fast Food Restaurant with Drive Thru	61.97	12.5794	0.7434	0.0000	31.1648
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.4151**	**0.9110**	**0.0000**	**38.1903**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

River Oaks Marketplace

Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.24	Acre	3.24	141,134.40	0
Parking Lot	109.00	Space	0.98	43,600.00	0
Fast Food Restaurant with Drive Thru	4.50	1000sqft	0.10	4,500.00	0
Fast Food Restaurant with Drive Thru	0.88	1000sqft	0.02	880.00	0
Convenience Market With Gas Pumps	4.65	1000sqft	0.11	4,650.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assume power is SMUD

Land Use - based on RFI

Construction Phase - based on RFI

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Arch coat only

Off-road Equipment -

Grading - acre graded based on entire site size

Trips and VMT - from RFI or default if unknown

Vehicle Trips - NO VMT complete because the project size is exempt from CEQA VMT analysis. Trips based on traffic memo

Construction Off-road Equipment Mitigation - No Haul trucks. BMPs require twice daily watering. Tier 4 Final ran, if applicable

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	18.00	34.00
tblConstructionPhase	NumDays	230.00	102.00
tblConstructionPhase	NumDays	5.00	48.00
tblConstructionPhase	NumDays	18.00	47.00
tblConstructionPhase	NumDays	8.00	48.00
tblConstructionPhase	PhaseEndDate	6/7/2022	6/1/2022
tblConstructionPhase	PhaseEndDate	4/18/2022	3/23/2022
tblConstructionPhase	PhaseEndDate	5/12/2021	6/21/2021
tblConstructionPhase	PhaseEndDate	5/31/2021	11/1/2021
tblConstructionPhase	PhaseEndDate	5/12/2022	4/15/2022
tblConstructionPhase	PhaseEndDate	5/19/2021	8/26/2021
tblConstructionPhase	PhaseStartDate	5/13/2022	4/15/2022
tblConstructionPhase	PhaseStartDate	6/1/2021	11/2/2021

tblConstructionPhase	PhaseStartDate	5/20/2021	8/27/2021
tblConstructionPhase	PhaseStartDate	4/19/2022	3/23/2022
tblConstructionPhase	PhaseStartDate	5/13/2021	6/22/2021
tblGrading	AcresOfGrading	24.00	5.23
tblTripsAndVMT	WorkerTripNumber	18.00	40.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	20.00	40.00
tblTripsAndVMT	WorkerTripNumber	81.00	80.00
tblVehicleTrips	ST_TR	1,448.33	914.62
tblVehicleTrips	ST_TR	722.03	727.14
tblVehicleTrips	SU_TR	1,182.08	914.62
tblVehicleTrips	SU_TR	542.72	727.14
tblVehicleTrips	WD_TR	845.60	914.62
tblVehicleTrips	WD_TR	496.12	727.14

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.0485	40.5792	22.3509	0.0411	18.3705	2.0465	20.4171	10.0114	1.8828	11.8942	0.0000	4,003.2764	4,003.2764	1.2002	0.0000	4,022.2529
2022	10.3813	20.2570	21.5780	0.0449	0.9228	0.9033	1.8261	0.2491	0.8547	1.1038	0.0000	4,374.6437	4,374.6437	0.6923	0.0000	4,391.9507
Maximum	**10.3813**	**40.5792**	**22.3509**	**0.0449**	**18.3705**	**2.0465**	**20.4171**	**10.0114**	**1.8828**	**11.8942**	**0.0000**	**4,374.6437**	**4,374.6437**	**1.2002**	**0.0000**	**4,391.9507**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.7473	5.6129	22.0656	0.0411	8.4341	0.0641	8.4982	4.5495	0.0640	4.6135	0.0000	4,003.2764	4,003.2764	1.2002	0.0000	4,022.2529
2022	8.8280	5.5963	22.6936	0.0449	0.9228	0.0573	0.9801	0.2491	0.0566	0.3057	0.0000	4,374.6437	4,374.6437	0.6923	0.0000	4,391.9507
Maximum	**8.8280**	**5.6129**	**22.6936**	**0.0449**	**8.4341**	**0.0641**	**8.4982**	**4.5495**	**0.0640**	**4.6135**	**0.0000**	**4,374.6437**	**4,374.6437**	**1.2002**	**0.0000**	**4,391.9507**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**33.64**	**81.57**	**-1.89**	**0.00**	**51.50**	**95.88**	**57.39**	**53.23**	**95.60**	**62.15**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Energy	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
Mobile	12.6792	31.4431	60.5521	0.1361	9.3112	0.1337	9.4449	2.4891	0.1248	2.6139		13,804.4870	13,804.4870	0.8704		13,826.2459
Total	**13.0289**	**31.7068**	**60.7859**	**0.1377**	**9.3112**	**0.1537**	**9.4650**	**2.4891**	**0.1449**	**2.6340**		**14,120.7842**	**14,120.7842**	**0.8765**	**5.8000e-003**	**14,144.4243**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Energy	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
Mobile	12.6792	31.4431	60.5521	0.1361	9.3112	0.1337	9.4449	2.4891	0.1248	2.6139		13,804.4870	13,804.4870	0.8704		13,826.2459
Total	**13.0289**	**31.7068**	**60.7859**	**0.1377**	**9.3112**	**0.1537**	**9.4650**	**2.4891**	**0.1449**	**2.6340**		**14,120.7842**	**14,120.7842**	**0.8765**	**5.8000e-003**	**14,144.4243**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Period 1a	Site Preparation	4/15/2021	6/21/2021	5	48	
2	Period 1b	Grading	6/22/2021	8/26/2021	5	48	
3	Period 1c	Paving	8/27/2021	11/1/2021	5	47	
4	Period 2a	Building Construction	11/2/2021	3/23/2022	5	102	
5	Period 2b	Architectural Coating	3/23/2022	4/15/2022	5	18	
6	Period 3	Paving	4/15/2022	6/1/2022	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,045; Non-Residential Outdoor: 5,015; Striped Parking Area: 11,084 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Period 3	Air Compressors	0	0.00	78	0.48
Period 2b	Cement and Mortar Mixers	0	0.00	9	0.56
Period 1a	Concrete/Industrial Saws	0		81	0.73
Period 1a	Excavators	0		158	0.38

Period 2a	Cranes	1	7.00	231	0.29
Period 2a	Forklifts	3	8.00	89	0.20
Period 1c	Excavators	0	0.00	158	0.38
Period 2b	Pavers	0	0.00	130	0.42
Period 2b	Rollers	0	0.00	80	0.38
Period 1a	Rubber Tired Dozers	3	8.00	247	0.40
Period 1c	Rubber Tired Dozers	0	0.00	247	0.40
Period 2a	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Period 2a	Generator Sets	1	8.00	84	0.74
Period 1c	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 2b	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Period 1b	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Period 1c	Graders	0	0.00	187	0.41
Period 2b	Paving Equipment	0	0.00	132	0.36
Period 1b	Rubber Tired Dozers	1	8.00	247	0.40
Period 2a	Welders	1	8.00	46	0.45
Period 2b	Air Compressors	1	6.00	78	0.48
Period 1c	Cement and Mortar Mixers	2	6.00	9	0.56
Period 3	Cement and Mortar Mixers	2	6.00	9	0.56
Period 1b	Excavators	1	8.00	158	0.38
Period 1b	Graders	1	8.00	187	0.41
Period 1c	Pavers	1	8.00	130	0.42
Period 3	Pavers	1	8.00	130	0.42
Period 1c	Paving Equipment	2	6.00	132	0.36
Period 3	Paving Equipment	2	6.00	132	0.36
Period 1c	Rollers	2	6.00	80	0.38
Period 3	Rollers	2	6.00	80	0.38

Period 3	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 1a	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Period 1a	7	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1b	6	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1c	8	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2a	9	80.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2b	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 3	8	20.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Period 1a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.2 Period 1a - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**8.1298**	**0.0621**	**8.1919**	**4.4688**	**0.0621**	**4.5309**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.3 Period 1b - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1376	0.0000	6.1376	3.3227	0.0000	3.3227			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671		2,871.9285	2,871.9285	0.9288		2,895.1495
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**6.1376**	**1.1599**	**7.2976**	**3.3227**	**1.0671**	**4.3898**		**2,871.9285**	**2,871.9285**	**0.9288**		**2,895.1495**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.3 Period 1b - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7619	0.0000	2.7619	1.4952	0.0000	1.4952			0.0000			0.0000
Off-Road	0.3632	1.5737	17.7527	0.0296		0.0484	0.0484		0.0484	0.0484	0.0000	2,871.9285	2,871.9285	0.9288		2,895.1495
Total	**0.3632**	**1.5737**	**17.7527**	**0.0296**	**2.7619**	**0.0484**	**2.8104**	**1.4952**	**0.0484**	**1.5436**	**0.0000**	**2,871.9285**	**2,871.9285**	**0.9288**		**2,895.1495**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.4 Period 1c - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342		1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.2352					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3292**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**		**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.4 Period 1c - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2194	0.9509	13.5323	0.0189		0.0293	0.0293		0.0293	0.0293	0.0000	1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.2352					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4547**	**0.9509**	**13.5323**	**0.0189**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1603	0.0821	1.1966	3.0800e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		306.5916	306.5916	8.1600e-003		306.7956
Total	**0.1603**	**0.0821**	**1.1966**	**3.0800e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**306.5916**	**306.5916**	**8.1600e-003**		**306.7956**

3.5 Period 2a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0989	3.2141	0.8207	7.9000e-003	0.1926	8.8200e-003	0.2014	0.0554	8.4300e-003	0.0638		836.7293	836.7293	0.0457		837.8726
Worker	0.3206	0.1641	2.3932	6.1600e-003	0.6086	4.1100e-003	0.6127	0.1614	3.7900e-003	0.1652		613.1832	613.1832	0.0163		613.5911
Total	**0.4195**	**3.3782**	**3.2140**	**0.0141**	**0.8011**	**0.0129**	**0.8140**	**0.2168**	**0.0122**	**0.2291**		**1,449.9125**	**1,449.9125**	**0.0621**		**1,451.4637**

3.5 Period 2a - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0989	3.2141	0.8207	7.9000e-003	0.1926	8.8200e-003	0.2014	0.0554	8.4300e-003	0.0638		836.7293	836.7293	0.0457		837.8726
Worker	0.3206	0.1641	2.3932	6.1600e-003	0.6086	4.1100e-003	0.6127	0.1614	3.7900e-003	0.1652		613.1832	613.1832	0.0163		613.5911
Total	**0.4195**	**3.3782**	**3.2140**	**0.0141**	**0.8011**	**0.0129**	**0.8140**	**0.2168**	**0.0122**	**0.2291**		**1,449.9125**	**1,449.9125**	**0.0621**		**1,451.4637**

3.5 Period 2a - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0918	3.0557	0.7562	7.8200e-003	0.1925	7.7200e-003	0.2003	0.0554	7.3900e-003	0.0628		829.4304	829.4304	0.0444		830.5407
Worker	0.2993	0.1476	2.2040	5.9400e-003	0.6086	4.0000e-003	0.6126	0.1614	3.6900e-003	0.1651		591.1930	591.1930	0.0147		591.5597
Total	**0.3910**	**3.2033**	**2.9602**	**0.0138**	**0.8011**	**0.0117**	**0.8128**	**0.2168**	**0.0111**	**0.2279**		**1,420.6234**	**1,420.6234**	**0.0591**		**1,422.1004**

3.5 Period 2a - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0918	3.0557	0.7562	7.8200e-003	0.1925	7.7200e-003	0.2003	0.0554	7.3900e-003	0.0628		829.4304	829.4304	0.0444		830.5407
Worker	0.2993	0.1476	2.2040	5.9400e-003	0.6086	4.0000e-003	0.6126	0.1614	3.6900e-003	0.1651		591.1930	591.1930	0.0147		591.5597
Total	**0.3910**	**3.2033**	**2.9602**	**0.0138**	**0.8011**	**0.0117**	**0.8128**	**0.2168**	**0.0111**	**0.2279**		**1,420.6234**	**1,420.6234**	**0.0591**		**1,422.1004**

3.6 Period 2b - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.0196					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**8.2241**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0599	0.0295	0.4408	1.1900e-003	0.1217	8.0000e-004	0.1225	0.0323	7.4000e-004	0.0330		118.2386	118.2386	2.9300e-003		118.3119
Total	**0.0599**	**0.0295**	**0.4408**	**1.1900e-003**	**0.1217**	**8.0000e-004**	**0.1225**	**0.0323**	**7.4000e-004**	**0.0330**		**118.2386**	**118.2386**	**2.9300e-003**		**118.3119**

3.6 Period 2b - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.0196					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**8.0493**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0599	0.0295	0.4408	1.1900e-003	0.1217	8.0000e-004	0.1225	0.0323	7.4000e-004	0.0330		118.2386	118.2386	2.9300e-003		118.3119
Total	**0.0599**	**0.0295**	**0.4408**	**1.1900e-003**	**0.1217**	**8.0000e-004**	**0.1225**	**0.0323**	**7.4000e-004**	**0.0330**		**118.2386**	**118.2386**	**2.9300e-003**		**118.3119**

3.7 Period 3 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3017**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0369	0.5510	1.4800e-003	0.1521	1.0000e-003	0.1531	0.0404	9.2000e-004	0.0413		147.7983	147.7983	3.6700e-003		147.8899
Total	**0.0748**	**0.0369**	**0.5510**	**1.4800e-003**	**0.1521**	**1.0000e-003**	**0.1531**	**0.0404**	**9.2000e-004**	**0.0413**		**147.7983**	**147.7983**	**3.6700e-003**		**147.8899**

3.7 Period 3 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2194	0.9509	13.5323	0.0189		0.0293	0.0293		0.0293	0.0293	0.0000	1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5446**	**0.9509**	**13.5323**	**0.0189**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0369	0.5510	1.4800e-003	0.1521	1.0000e-003	0.1531	0.0404	9.2000e-004	0.0413		147.7983	147.7983	3.6700e-003		147.8899
Total	**0.0748**	**0.0369**	**0.5510**	**1.4800e-003**	**0.1521**	**1.0000e-003**	**0.1531**	**0.0404**	**9.2000e-004**	**0.0413**		**147.7983**	**147.7983**	**3.6700e-003**		**147.8899**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.6792	31.4431	60.5521	0.1361	9.3112	0.1337	9.4449	2.4891	0.1248	2.6139		13,804.4870	13,804.4870	0.8704		13,826.2459
Unmitigated	12.6792	31.4431	60.5521	0.1361	9.3112	0.1337	9.4449	2.4891	0.1248	2.6139		13,804.4870	13,804.4870	0.8704		13,826.2459

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	4,252.98	4,252.98	4252.98	1,687,510	1,687,510
Fast Food Restaurant with Drive Thru	3,272.13	3,272.13	3272.13	2,260,370	2,260,370
Fast Food Restaurant with Drive Thru	639.88	639.88	639.88	442,028	442,028
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	8,165.00	8,165.00	8,165.00	4,389,908	4,389,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	10.00	5.00	6.50	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Other Asphalt Surfaces	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Fast Food Restaurant with Drive Thru	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Other Asphalt Surfaces	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Parking Lot	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
NaturalGas Unmitigated	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	69.0493	7.4000e-004	6.7700e-003	5.6900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004		8.1235	8.1235	1.6000e-004	1.5000e-004	8.1717
Fast Food Restaurant with Drive Thru	2190.82	0.0236	0.2148	0.1804	1.2900e-003		0.0163	0.0163		0.0163	0.0163		257.7438	257.7438	4.9400e-003	4.7300e-003	259.2754
Fast Food Restaurant with Drive Thru	428.427	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003		50.4032	50.4032	9.7000e-004	9.2000e-004	50.7027
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0290**	**0.2636**	**0.2214**	**1.5800e-003**		**0.0200**	**0.0200**		**0.0200**	**0.0200**		**316.2704**	**316.2704**	**6.0700e-003**	**5.8000e-003**	**318.1499**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	0.0690493	7.4000e-004	6.7700e-003	5.6900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004		8.1235	8.1235	1.6000e-004	1.5000e-004	8.1717
Fast Food Restaurant with Drive Thru	0.428427	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003		50.4032	50.4032	9.7000e-004	9.2000e-004	50.7027
Fast Food Restaurant with Drive Thru	2.19082	0.0236	0.2148	0.1804	1.2900e-003		0.0163	0.0163		0.0163	0.0163		257.7438	257.7438	4.9400e-003	4.7300e-003	259.2754
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0290**	**0.2636**	**0.2214**	**1.5800e-003**		**0.0200**	**0.0200**		**0.0200**	**0.0200**		**316.2704**	**316.2704**	**6.0700e-003**	**5.8000e-003**	**318.1499**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Unmitigated	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0396					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2801					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1600e-003	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Total	**0.3208**	**1.1000e-004**	**0.0125**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0268**	**0.0268**	**7.0000e-005**		**0.0285**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0396					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2801					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1600e-003	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Total	**0.3208**	**1.1000e-004**	**0.0125**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0268**	**0.0268**	**7.0000e-005**		**0.0285**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

River Oaks Marketplace

Sacramento County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.24	Acre	3.24	141,134.40	0
Parking Lot	109.00	Space	0.98	43,600.00	0
Fast Food Restaurant with Drive Thru	4.50	1000sqft	0.10	4,500.00	0
Fast Food Restaurant with Drive Thru	0.88	1000sqft	0.02	880.00	0
Convenience Market With Gas Pumps	4.65	1000sqft	0.11	4,650.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assume power is SMUD

Land Use - based on RFI

Construction Phase - based on RFI

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Arch coat only

Off-road Equipment -

Grading - acre graded based on entire site size

Trips and VMT - from RFI or default if unknown

Vehicle Trips - NO VMT complete because the project size is exempt from CEQA VMT analysis. Trips based on traffic memo

Construction Off-road Equipment Mitigation - No Haul trucks. BMPs require twice daily watering. Tier 4 Final ran, if applicable

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	18.00	34.00
tblConstructionPhase	NumDays	230.00	102.00
tblConstructionPhase	NumDays	5.00	48.00
tblConstructionPhase	NumDays	18.00	47.00
tblConstructionPhase	NumDays	8.00	48.00
tblConstructionPhase	PhaseEndDate	6/7/2022	6/1/2022
tblConstructionPhase	PhaseEndDate	4/18/2022	3/23/2022
tblConstructionPhase	PhaseEndDate	5/12/2021	6/21/2021
tblConstructionPhase	PhaseEndDate	5/31/2021	11/1/2021
tblConstructionPhase	PhaseEndDate	5/12/2022	4/15/2022
tblConstructionPhase	PhaseEndDate	5/19/2021	8/26/2021
tblConstructionPhase	PhaseStartDate	5/13/2022	4/15/2022
tblConstructionPhase	PhaseStartDate	6/1/2021	11/2/2021

tblConstructionPhase	PhaseStartDate	5/20/2021	8/27/2021
tblConstructionPhase	PhaseStartDate	4/19/2022	3/23/2022
tblConstructionPhase	PhaseStartDate	5/13/2021	6/22/2021
tblGrading	AcresOfGrading	24.00	5.23
tblTripsAndVMT	WorkerTripNumber	18.00	40.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	20.00	40.00
tblTripsAndVMT	WorkerTripNumber	81.00	80.00
tblVehicleTrips	ST_TR	1,448.33	914.62
tblVehicleTrips	ST_TR	722.03	727.14
tblVehicleTrips	SU_TR	1,182.08	914.62
tblVehicleTrips	SU_TR	542.72	727.14
tblVehicleTrips	WD_TR	845.60	914.62
tblVehicleTrips	WD_TR	496.12	727.14

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.0358	40.5985	22.1749	0.0407	18.3705	2.0465	20.4171	10.0114	1.8828	11.8942	0.0000	3,954.9226	3,954.9226	1.1992	0.0000	3,984.9024
2022	10.3589	20.3433	21.3011	0.0438	0.9228	0.9038	1.8266	0.2491	0.8552	1.1043	0.0000	4,266.8439	4,266.8439	0.6938	0.0000	4,284.1897
Maximum	**10.3589**	**40.5985**	**22.1749**	**0.0438**	**18.3705**	**2.0465**	**20.4171**	**10.0114**	**1.8828**	**11.8942**	**0.0000**	**4,266.8439**	**4,266.8439**	**1.1992**	**0.0000**	**4,284.1897**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.7279	5.7044	21.8896	0.0407	8.4341	0.0641	8.4982	4.5495	0.0640	4.6135	0.0000	3,954.9226	3,954.9226	1.1992	0.0000	3,984.9024
2022	8.8057	5.6827	22.4168	0.0438	0.9228	0.0578	0.9806	0.2491	0.0570	0.3062	0.0000	4,266.8439	4,266.8439	0.6938	0.0000	4,284.1897
Maximum	**8.8057**	**5.7044**	**22.4168**	**0.0438**	**8.4341**	**0.0641**	**8.4982**	**4.5495**	**0.0640**	**4.6135**	**0.0000**	**4,266.8439**	**4,266.8439**	**1.1992**	**0.0000**	**4,284.1897**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**33.77**	**81.31**	**-1.91**	**0.00**	**51.50**	**95.87**	**57.39**	**53.23**	**95.58**	**62.15**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Energy	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
Mobile	8.7172	32.1067	69.2273	0.1235	9.3112	0.1396	9.4508	2.4891	0.1305	2.6196		12,511.3681	12,511.3681	0.9522		12,535.1743
Total	**9.0669**	**32.3704**	**69.4612**	**0.1251**	**9.3112**	**0.1597**	**9.4709**	**2.4891**	**0.1505**	**2.6397**		**12,827.6653**	**12,827.6653**	**0.9584**	**5.8000e-003**	**12,853.3526**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Energy	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
Mobile	8.7172	32.1067	69.2273	0.1235	9.3112	0.1396	9.4508	2.4891	0.1305	2.6196		12,511.3681	12,511.3681	0.9522		12,535.1743
Total	**9.0669**	**32.3704**	**69.4612**	**0.1251**	**9.3112**	**0.1597**	**9.4709**	**2.4891**	**0.1505**	**2.6397**		**12,827.6653**	**12,827.6653**	**0.9584**	**5.8000e-003**	**12,853.3526**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Period 1a	Site Preparation	4/15/2021	6/21/2021	5	48	
2	Period 1b	Grading	6/22/2021	8/26/2021	5	48	
3	Period 1c	Paving	8/27/2021	11/1/2021	5	47	
4	Period 2a	Building Construction	11/2/2021	3/23/2022	5	102	
5	Period 2b	Architectural Coating	3/23/2022	4/15/2022	5	18	
6	Period 3	Paving	4/15/2022	6/1/2022	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,045; Non-Residential Outdoor: 5,015; Striped Parking Area: 11,084 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Period 3	Air Compressors	0	0.00	78	0.48
Period 2b	Cement and Mortar Mixers	0	0.00	9	0.56
Period 1a	Concrete/Industrial Saws	0		81	0.73
Period 1a	Excavators	0		158	0.38

Period 2a	Cranes	1	7.00	231	0.29
Period 2a	Forklifts	3	8.00	89	0.20
Period 1c	Excavators	0	0.00	158	0.38
Period 2b	Pavers	0	0.00	130	0.42
Period 2b	Rollers	0	0.00	80	0.38
Period 1a	Rubber Tired Dozers	3	8.00	247	0.40
Period 1c	Rubber Tired Dozers	0	0.00	247	0.40
Period 2a	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Period 2a	Generator Sets	1	8.00	84	0.74
Period 1c	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 2b	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Period 1b	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Period 1c	Graders	0	0.00	187	0.41
Period 2b	Paving Equipment	0	0.00	132	0.36
Period 1b	Rubber Tired Dozers	1	8.00	247	0.40
Period 2a	Welders	1	8.00	46	0.45
Period 2b	Air Compressors	1	6.00	78	0.48
Period 1c	Cement and Mortar Mixers	2	6.00	9	0.56
Period 3	Cement and Mortar Mixers	2	6.00	9	0.56
Period 1b	Excavators	1	8.00	158	0.38
Period 1b	Graders	1	8.00	187	0.41
Period 1c	Pavers	1	8.00	130	0.42
Period 3	Pavers	1	8.00	130	0.42
Period 1c	Paving Equipment	2	6.00	132	0.36
Period 3	Paving Equipment	2	6.00	132	0.36
Period 1c	Rollers	2	6.00	80	0.38
Period 3	Rollers	2	6.00	80	0.38

Period 3	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Period 1a	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Period 1a	7	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1b	6	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 1c	8	40.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2a	9	80.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 2b	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Period 3	8	20.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Period 1a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.2 Period 1a - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**8.1298**	**0.0621**	**8.1919**	**4.4688**	**0.0621**	**4.5309**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.3 Period 1b - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1376	0.0000	6.1376	3.3227	0.0000	3.3227			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671		2,871.9285	2,871.9285	0.9288		2,895.1495
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**6.1376**	**1.1599**	**7.2976**	**3.3227**	**1.0671**	**4.3898**		**2,871.9285**	**2,871.9285**	**0.9288**		**2,895.1495**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.3 Period 1b - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7619	0.0000	2.7619	1.4952	0.0000	1.4952			0.0000			0.0000
Off-Road	0.3632	1.5737	17.7527	0.0296		0.0484	0.0484		0.0484	0.0484	0.0000	2,871.9285	2,871.9285	0.9288		2,895.1495
Total	**0.3632**	**1.5737**	**17.7527**	**0.0296**	**2.7619**	**0.0484**	**2.8104**	**1.4952**	**0.0484**	**1.5436**	**0.0000**	**2,871.9285**	**2,871.9285**	**0.9288**		**2,895.1495**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.4 Period 1c - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342		1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.2352					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3292**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**		**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.4 Period 1c - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2194	0.9509	13.5323	0.0189		0.0293	0.0293		0.0293	0.0293	0.0000	1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.2352					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4547**	**0.9509**	**13.5323**	**0.0189**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1476	0.1014	1.0207	2.7000e-003	0.3043	2.0500e-003	0.3063	0.0807	1.8900e-003	0.0826		269.2657	269.2657	7.1800e-003		269.4451
Total	**0.1476**	**0.1014**	**1.0207**	**2.7000e-003**	**0.3043**	**2.0500e-003**	**0.3063**	**0.0807**	**1.8900e-003**	**0.0826**		**269.2657**	**269.2657**	**7.1800e-003**		**269.4451**

3.5 Period 2a - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1048	3.2670	0.9519	7.7000e-003	0.1926	9.3600e-003	0.2019	0.0554	8.9600e-003	0.0644		815.2066	815.2066	0.0495		816.4447
Worker	0.2953	0.2027	2.0413	5.4100e-003	0.6086	4.1100e-003	0.6127	0.1614	3.7900e-003	0.1652		538.5314	538.5314	0.0144		538.8902
Total	**0.4000**	**3.4697**	**2.9932**	**0.0131**	**0.8011**	**0.0135**	**0.8146**	**0.2168**	**0.0128**	**0.2296**		**1,353.7380**	**1,353.7380**	**0.0639**		**1,355.3349**

3.5 Period 2a - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1048	3.2670	0.9519	7.7000e-003	0.1926	9.3600e-003	0.2019	0.0554	8.9600e-003	0.0644		815.2066	815.2066	0.0495		816.4447
Worker	0.2953	0.2027	2.0413	5.4100e-003	0.6086	4.1100e-003	0.6127	0.1614	3.7900e-003	0.1652		538.5314	538.5314	0.0144		538.8902
Total	**0.4000**	**3.4697**	**2.9932**	**0.0131**	**0.8011**	**0.0135**	**0.8146**	**0.2168**	**0.0128**	**0.2296**		**1,353.7380**	**1,353.7380**	**0.0639**		**1,355.3349**

3.5 Period 2a - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0972	3.1005	0.8779	7.6200e-003	0.1925	8.2300e-003	0.2008	0.0554	7.8700e-003	0.0633		807.9632	807.9632	0.0481		809.1661
Worker	0.2761	0.1822	1.8719	5.2100e-003	0.6086	4.0000e-003	0.6126	0.1614	3.6900e-003	0.1651		519.2493	519.2493	0.0129		519.5710
Total	**0.3734**	**3.2828**	**2.7497**	**0.0128**	**0.8011**	**0.0122**	**0.8133**	**0.2168**	**0.0116**	**0.2284**		**1,327.2124**	**1,327.2124**	**0.0610**		**1,328.7372**

3.5 Period 2a - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0972	3.1005	0.8779	7.6200e-003	0.1925	8.2300e-003	0.2008	0.0554	7.8700e-003	0.0633		807.9632	807.9632	0.0481		809.1661
Worker	0.2761	0.1822	1.8719	5.2100e-003	0.6086	4.0000e-003	0.6126	0.1614	3.6900e-003	0.1651		519.2493	519.2493	0.0129		519.5710
Total	**0.3734**	**3.2828**	**2.7497**	**0.0128**	**0.8011**	**0.0122**	**0.8133**	**0.2168**	**0.0116**	**0.2284**		**1,327.2124**	**1,327.2124**	**0.0610**		**1,328.7372**

3.6 Period 2b - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.0196					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**8.2241**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0365	0.3744	1.0400e-003	0.1217	8.0000e-004	0.1225	0.0323	7.4000e-004	0.0330		103.8499	103.8499	2.5700e-003		103.9142
Total	**0.0552**	**0.0365**	**0.3744**	**1.0400e-003**	**0.1217**	**8.0000e-004**	**0.1225**	**0.0323**	**7.4000e-004**	**0.0330**		**103.8499**	**103.8499**	**2.5700e-003**		**103.9142**

3.6 Period 2b - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.0196					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**8.0493**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0365	0.3744	1.0400e-003	0.1217	8.0000e-004	0.1225	0.0323	7.4000e-004	0.0330		103.8499	103.8499	2.5700e-003		103.9142
Total	**0.0552**	**0.0365**	**0.3744**	**1.0400e-003**	**0.1217**	**8.0000e-004**	**0.1225**	**0.0323**	**7.4000e-004**	**0.0330**		**103.8499**	**103.8499**	**2.5700e-003**		**103.9142**

3.7 Period 3 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3017**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0456	0.4680	1.3000e-003	0.1521	1.0000e-003	0.1531	0.0404	9.2000e-004	0.0413		129.8123	129.8123	3.2200e-003		129.8928
Total	**0.0690**	**0.0456**	**0.4680**	**1.3000e-003**	**0.1521**	**1.0000e-003**	**0.1531**	**0.0404**	**9.2000e-004**	**0.0413**		**129.8123**	**129.8123**	**3.2200e-003**		**129.8928**

3.7 Period 3 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2194	0.9509	13.5323	0.0189		0.0293	0.0293		0.0293	0.0293	0.0000	1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5446**	**0.9509**	**13.5323**	**0.0189**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0456	0.4680	1.3000e-003	0.1521	1.0000e-003	0.1531	0.0404	9.2000e-004	0.0413		129.8123	129.8123	3.2200e-003		129.8928
Total	**0.0690**	**0.0456**	**0.4680**	**1.3000e-003**	**0.1521**	**1.0000e-003**	**0.1531**	**0.0404**	**9.2000e-004**	**0.0413**		**129.8123**	**129.8123**	**3.2200e-003**		**129.8928**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	8.7172	32.1067	69.2273	0.1235	9.3112	0.1396	9.4508	2.4891	0.1305	2.6196		12,511.3681	12,511.3681	0.9522		12,535.1743
Unmitigated	8.7172	32.1067	69.2273	0.1235	9.3112	0.1396	9.4508	2.4891	0.1305	2.6196		12,511.3681	12,511.3681	0.9522		12,535.1743

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	4,252.98	4,252.98	4252.98	1,687,510	1,687,510
Fast Food Restaurant with Drive Thru	3,272.13	3,272.13	3272.13	2,260,370	2,260,370
Fast Food Restaurant with Drive Thru	639.88	639.88	639.88	442,028	442,028
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	8,165.00	8,165.00	8,165.00	4,389,908	4,389,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	10.00	5.00	6.50	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Fast Food Restaurant with Drive	10.00	5.00	6.50	2.20	78.80	19.00	29	21	50
Other Asphalt Surfaces	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Fast Food Restaurant with Drive Thru	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Other Asphalt Surfaces	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865
Parking Lot	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499
NaturalGas Unmitigated	0.0290	0.2636	0.2214	1.5800e-003		0.0200	0.0200		0.0200	0.0200		316.2704	316.2704	6.0600e-003	5.8000e-003	318.1499

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	69.0493	7.4000e-004	6.7700e-003	5.6900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004		8.1235	8.1235	1.6000e-004	1.5000e-004	8.1717
Fast Food Restaurant with Drive Thru	2190.82	0.0236	0.2148	0.1804	1.2900e-003		0.0163	0.0163		0.0163	0.0163		257.7438	257.7438	4.9400e-003	4.7300e-003	259.2754
Fast Food Restaurant with Drive Thru	428.427	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003		50.4032	50.4032	9.7000e-004	9.2000e-004	50.7027
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0290**	**0.2636**	**0.2214**	**1.5800e-003**		**0.0200**	**0.0200**		**0.0200**	**0.0200**		**316.2704**	**316.2704**	**6.0700e-003**	**5.8000e-003**	**318.1499**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	0.0690493	7.4000e-004	6.7700e-003	5.6900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004		8.1235	8.1235	1.6000e-004	1.5000e-004	8.1717
Fast Food Restaurant with Drive Thru	2.19082	0.0236	0.2148	0.1804	1.2900e-003		0.0163	0.0163		0.0163	0.0163		257.7438	257.7438	4.9400e-003	4.7300e-003	259.2754
Fast Food Restaurant with Drive Thru	0.428427	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003		50.4032	50.4032	9.7000e-004	9.2000e-004	50.7027
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0290**	**0.2636**	**0.2214**	**1.5800e-003**		**0.0200**	**0.0200**		**0.0200**	**0.0200**		**316.2704**	**316.2704**	**6.0700e-003**	**5.8000e-003**	**318.1499**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Unmitigated	0.3208	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0396					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2801					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1600e-003	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Total	**0.3208**	**1.1000e-004**	**0.0125**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0268**	**0.0268**	**7.0000e-005**		**0.0285**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0396					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2801					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1600e-003	1.1000e-004	0.0125	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0268	0.0268	7.0000e-005		0.0285
Total	**0.3208**	**1.1000e-004**	**0.0125**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0268**	**0.0268**	**7.0000e-005**		**0.0285**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

A-2 AERSCREEN Output

```
AERSCREEN 16216 / AERMOD 18081                                      09/25/20
                                                                    15:30:13

TITLE: RiverOaksMarketplace


----------------------------------------------------------------------------
******************************  AREA PARAMETERS  ***************************
----------------------------------------------------------------------------

SOURCE EMISSION RATE:            1.0000 g/s               7.937 lb/hr

AREA EMISSION RATE:           0.470E-04 g/(s-m2)       0.373E-03 lb/(hr-m2)
AREA HEIGHT:                       5.00 meters            16.40 feet
AREA SOURCE LONG SIDE:           190.00 meters           623.36 feet
AREA SOURCE SHORT SIDE:          112.00 meters           367.45 feet
INITIAL VERTICAL DIMENSION:        1.40 meters             4.59 feet
RURAL OR URBAN:                   RURAL

FLAGPOLE RECEPTOR HEIGHT:          1.50 meters             4.92 feet

INITIAL PROBE DISTANCE =          5000. meters           16404. feet



----------------------------------------------------------------------------
***********************  BUILDING DOWNWASH PARAMETERS  *********************
----------------------------------------------------------------------------

               BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES



----------------------------------------------------------------------------
**************************  FLOW SECTOR ANALYSIS  ***************************
                 25 meter receptor spacing: 1. meters - 5000. meters
----------------------------------------------------------------------------


   MAXIMUM  IMPACT  RECEPTOR

   Zo        SURFACE   1-HR CONC  RADIAL  DIST   TEMPORAL
   SECTOR    ROUGHNESS  (ug/m3)    (deg)   (m)    PERIOD
  -----------------------------------------------------
      1*       0.050     2640.       0   125.0     AUT
* = worst case diagonal
```

```
-----------------------------------------------------------------------------
**********************  MAKEMET METEOROLOGY PARAMETERS  *********************
-----------------------------------------------------------------------------

MIN/MAX TEMPERATURE:    250.0 / 310.0 (K)

MINIMUM WIND SPEED:       0.5 m/s

ANEMOMETER HEIGHT:     10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Cultivated Land
DOMINANT CLIMATE TYPE:    Average Moisture
DOMINANT SEASON:          Autumn

ALBEDO:                  0.18
BOWEN RATIO:             0.70
ROUGHNESS LENGTH:       0.050 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED


       METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT
       -------------------------------------------------------------

 YR MO DY JDY HR
 -- -- -- --- --
 10 01 07   7 01

    H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 -0.19  0.034 -9.000  0.020 -999.   14.     16.1 0.050   0.70   0.18    0.50

    HT  REF TA     HT
- - - - - - - - - - -
  10.0   250.0    2.0



-----------------------------------------------------------------------------
************************ AERSCREEN AUTOMATED DISTANCES **********************
                  OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE
-----------------------------------------------------------------------------
```

```
             MAXIMUM                                    MAXIMUM
   DIST     1-HR CONC                    DIST     1-HR CONC
    (m)      (ug/m3)                      (m)      (ug/m3)
---------------------               ---------------------
   1.00     1261.                  2525.00     261.0
  25.00     1565.                  2550.00     257.7
  50.00     1841.                  2575.00     254.5
  75.00     2155.                  2600.00     251.4
 100.00     2476.                  2625.00     248.4
 125.00     2640.                  2650.00     245.4
 150.00     2634.                  2675.00     242.5
 175.00     2595.                  2700.00     240.6
 200.00     2506.                  2725.00     239.0
 225.00     2420.                  2750.00     237.5
 250.00     2374.                  2775.00     236.0
 275.00     2308.                  2800.00     234.5
 300.00     2231.                  2825.00     233.1
 325.00     2148.                  2850.00     231.6
 350.00     2064.                  2875.00     230.2
 375.00     1980.                  2900.00     228.8
 400.00     1896.                  2925.00     227.5
 425.00     1818.                  2950.00     226.1
 450.00     1741.                  2975.00     224.8
 475.00     1668.                  3000.00     223.5
 500.00     1599.                  3025.00     222.2
 525.00     1535.                  3050.00     220.9
 550.00     1473.                  3075.00     219.6
 575.00     1415.                  3100.00     218.4
 600.00     1360.                  3125.00     217.2
 625.00     1310.                  3150.00     215.9
 650.00     1261.                  3174.99     214.8
 675.00     1215.                  3200.00     213.6
 700.00     1171.                  3225.00     212.4
 725.00     1131.                  3250.00     211.3
 750.00     1093.                  3275.00     210.1
 775.00     1056.                  3300.00     209.0
 800.00     1021.                  3325.00     207.9
 825.00     988.6                  3350.00     206.8
 850.00     957.4                  3375.00     205.8
 875.00     928.0                  3400.00     204.7
 900.00     900.1                  3425.00     203.6
 925.00     873.6                  3450.00     202.6
 950.00     848.1                  3475.00     201.6
 975.00     823.8                  3500.00     200.6
1000.00     800.8                  3525.00     199.6
1025.00     778.9                  3550.00     198.6
1050.00     758.1                  3575.00     197.6
1075.00     738.1                  3600.00     196.7
```

1100.00	718.9	3625.00	195.7
1125.00	700.6	3650.00	194.8
1150.00	683.1	3675.00	193.8
1175.00	666.4	3700.00	192.9
1200.00	650.1	3725.00	192.0
1225.00	634.5	3750.00	191.1
1250.00	619.6	3775.00	190.2
1275.00	605.3	3800.00	189.4
1300.00	591.7	3825.00	188.5
1325.00	578.4	3850.00	187.6
1350.00	565.7	3875.00	186.8
1375.00	553.5	3900.00	185.9
1400.00	541.8	3925.00	185.1
1425.00	530.5	3950.00	184.3
1450.00	519.6	3975.00	183.5
1475.00	509.1	4000.00	182.7
1500.00	498.9	4025.00	181.9
1525.00	489.1	4050.00	181.1
1550.00	479.5	4075.00	180.3
1575.00	470.3	4100.00	179.5
1600.00	461.4	4125.00	178.8
1625.00	452.7	4150.00	178.0
1650.00	444.2	4175.00	177.3
1675.00	436.1	4200.00	176.5
1700.00	428.2	4225.00	175.8
1725.00	420.5	4250.00	175.1
1750.00	413.1	4275.00	174.4
1775.00	406.0	4300.00	173.6
1800.00	399.0	4325.00	172.9
1825.00	392.2	4350.00	172.2
1850.00	385.7	4375.00	171.6
1875.01	379.3	4400.00	170.9
1900.00	373.1	4425.00	170.2
1924.99	367.1	4450.00	169.5
1950.00	361.3	4475.00	168.9
1975.00	355.6	4500.00	168.2
2000.00	350.0	4525.00	167.6
2025.00	344.6	4550.00	166.9
2050.00	339.4	4575.00	166.3
2075.00	334.3	4600.00	165.6
2100.00	329.3	4625.00	165.0
2125.00	324.5	4650.00	164.4
2150.00	319.8	4675.00	163.8
2175.00	315.2	4700.00	163.2
2200.00	310.7	4725.00	162.6
2225.00	306.4	4750.00	162.0
2250.00	302.1	4775.00	161.4
2275.00	297.9	4800.00	160.8

```
         2300.00     293.9                   4825.00     160.2
         2325.00     289.9                   4850.00     159.6
         2350.00     286.0                   4875.00     159.0
         2375.00     282.2                   4899.99     158.5
         2400.00     278.4                   4925.00     157.9
         2425.00     274.8                   4950.00     157.3
         2450.00     271.2                   4975.00     156.8
         2475.00     267.7                   5000.00     156.2
         2500.00     264.3


-----------------------------------------------------------------------------
**********************  AERSCREEN MAXIMUM IMPACT SUMMARY  *********************
-----------------------------------------------------------------------------

3-hour, 8-hour, and 24-hour scaled
concentrations are equal to the 1-hour concentration as referenced in
SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY
IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)
Report number EPA-454/R-92-019
http://www.epa.gov/scram001/guidance_permit.htm
under Screening Guidance

                     MAXIMUM     SCALED      SCALED      SCALED      SCALED
                      1-HOUR      3-HOUR      8-HOUR     24-HOUR      ANNUAL
  CALCULATION          CONC        CONC        CONC        CONC        CONC
   PROCEDURE         (ug/m3)     (ug/m3)     (ug/m3)     (ug/m3)     (ug/m3)
---------------    ----------  ----------  ----------  ----------  ----------
FLAT TERRAIN        2656.       2656.       2656.       2656.         N/A

DISTANCE FROM SOURCE        136.00 meters



IMPACT AT THE
AMBIENT BOUNDARY    1261.       1261.       1261.       1261.         N/A

DISTANCE FROM SOURCE          1.00 meters
```

A-3 Health Risk Assessment Calculations

River Oaks Marketplace - Construction HRA

For Nearby Resident

MEISR

	Distance from Source Center		AERSCREEN OUT [ug/m^3]/[g/s]	
	(ft)	(m)	max	annual
Resident	376	115	2656.0	265.6

	PM_{10} Exhaust (tons)		Start Date	End Date	Duration
	Unmitigated	Mitigated			Days
Construction	0.1441	0.0060	4/15/2021	6/1/2022	412

	DPM Exhaust (g/s)	
	Unmitigated	Mitigated
Construction	0.0037	0.0002

Cancer Risk = Dose inhalation × Inhalation CPF × ASF × ED/AT × FAH **(Equation 8.2.4 A)**

Where:

Cancer Risk = residential inhalation cancer risk

Dose inhalation (mg/kg-day) = C_{AIR} × DBR × A × EF × 10^{-6} **(Equation 5.4.1.1)**

Inhalation CPF = inhalation cancer potency factor ([mg/kg/day]$^{-1}$)

ASF = age sensitivity factor for a specified age group (unitless)

ED = exposure duration for a specified age group (years)

AT = averaging time period over which exposure is averaged in days (years)

FAH = fraction of time at home (unitless)

Where:

C_{AIR} = concentration of compound in air in micrograms per cubic meter (μg/m^3)

DBR = daily breathing rate in liter per kilogram of body weight per day (L/kg-body weight/day)

A = inhalation absorption factor (1 for DPM, unitless)

EF = exposure frequency in days per year (unitless, days/365 days)

10^{-6} = micrograms to milligrams conversion, liters to cubic meters conversion

Hazard Quotient = C_{air} / REL **(Section 8.3.1)**

Where:

Hazard Quotient = chronic non-cancer hazard

C_{AIR} = concentration of compound in air in micrograms per cubic meter (μg/m^3)

REL = Chronic non-cancer Reference Exposure Level for substance (μg/m^3)

Dose Inhalation Inputs

			Unmitigated	Mitigated			
Receptor Type	**Exposure Scenario**	**Receptor Group Age**	**C_{AIR} (μg/m^3)**		**DBR (L/kg-day)**	**A (unitless)**	**EF (days/year)**
Off-Site Child Resident	Construction	3rd Trimester	9.76E-01	4.03E-02	361	1	0.96
		Age 0<2	9.76E-01	4.03E-02	1090	1	0.96

Dose Inhalation Outputs

			Unmitigated	Mitigated
Receptor Type	**Exposure Scenario**	**Receptor Group Age**	**Dose inhalation (mg/kg-day)**	
Off-Site Child Resident	Construction	3rd Trimester	3.38E-04	1.40E-05
		Age 0<2	1.02E-03	4.22E-05

Risk Inputs

Receptor Type	**Exposure Scenario**	**Receptor Group Age**	**CPF (mg/kg-day^{-1})**	**ASF (unitless)**	**ED (years)**	**AT (years)**	**FAH (unitless)**	**MAF (unitless)**
Off-Site Child Resident	Construction	3rd Trimester	1.1	10	0.25	70.00	1	1
		Age 0<2	1.1	10	0.88	70.00	1	1

Risk Outputs

			Unmitigated	Mitigated	Unmitigated	Mitigated
Receptor Type	**Exposure Scenario**	**Receptor Group Age**	**Cancer Risk**		**Hazard Risk**	
Off-Site Child Resident	Construction	3rd Trimester	1.33E-05	5.49E-07	0.20	0.01
		Age 0<2	1.41E-04	5.83E-06		
Total Cancer Risk (per million)			154.24	6.38		

SOURCE: Office of Environmental Health Hazard Assessment, 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments* .
Daily breathing rate for school receptor is based on the OEHHA 95th percentile 8-hour moderate intensity breathing rates (Table 5.8).
Fraction of time at home is set to 1 for residential since the nearest school unmitigated cancer risk is >1 per million, per OEHHA Table 8.4.
Inhalation cancer potency factor from Table 7.1

Attachment B

Biological Resources

CALIFORNIA DEPARTMENT OF
FISH and WILDLIFE **RareFind**

Query Summary:
Quad IS (Grays Bend (3812166) OR Taylor Monument (3812165) OR Rio Linda (3812164) OR Davis (3812156) OR Sacramento East (3812154) OR Sacramento West (3812155) OR Saxon (3812146) OR Clarksburg (3812145) OR Florin (3812144))

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter cooperii	Cooper's hawk	Birds	ABNKC12040	118	3	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	955	22	None	Threatened	G2G3	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Ammodramus savannarum	grasshopper sparrow	Birds	ABPBXA0020	27	2	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Valley & foothill grassland
Antrozous pallidus	pallid bat	Mammals	AMACC10010	420	1	None	None	G5	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub, Upper montane coniferous forest, Valley & foothill grassland
Archoplites interruptus	Sacramento perch	Fish	AFCQB07010	5	1	None	None	G2G3	S1	null	AFS_TH-Threatened, CDFW_SSC-Species of Special Concern	Aquatic, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters
Ardea alba	great egret	Birds	ABNGA04040	43	6	None	None	G5	S4	null	CDF_S-Sensitive, IUCN_LC-Least Concern	Brackish marsh, Estuary, Freshwater marsh, Marsh & swamp, Riparian forest, Wetland
Ardea herodias	great blue heron	Birds	ABNGA04010	156	7	None	None	G5	S4	null	CDF_S-Sensitive, IUCN_LC-Least Concern	Brackish marsh, Estuary, Freshwater marsh, Marsh & swamp, Riparian forest, Wetland
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Dicots	PDFAB0F8R3	18	4	None	None	G2T1	S1	1B.1	null	Meadow & seep, Valley & foothill grassland, Wetland
Astragalus tener var. tener	alkali milk-vetch	Dicots	PDFAB0F8R1	65	10	None	None	G2T1	S1	1B.2	null	Alkali playa, Valley & foothill grassland, Vernal pool, Wetland
	burrowing owl	Birds	ABNSB10010	1989	87	None	None	G4	S3	null		

Athene cunicularia											BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex cordulata var. cordulata	heartscale	Dicots	PDCHE040B0	66	1	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland
Atriplex depressa	brittlescale	Dicots	PDCHE042L0	60	5	None	None	G2	S2	1B.2	null	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	276	1	None	Candidate Endangered	G3G4	S1S2	null	null	null
Bombus occidentalis	western bumble bee	Insects	IIHYM24250	281	1	None	Candidate Endangered	G2G3	S1	null	USFS_S-Sensitive	null
Branchinecta conservatio	Conservancy fairy shrimp	Crustaceans	ICBRA03010	47	1	Endangered	None	G2	S2	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	791	39	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta mesovallensis	midvalley fairy shrimp	Crustaceans	ICBRA03150	144	8	None	None	G2	S2S3	null	null	Vernal pool, Wetland
Buteo regalis	ferruginous hawk	Birds	ABNKC19120	107	2	None	None	G4	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Great Basin scrub, Pinon & juniper woodlands, Valley & foothill grassland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2535	313	None	Threatened	G5	S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland
Carex comosa	bristly sedge	Monocots	PMCYP032Y0	29	1	None	None	G5	S2	2B.1	null	Coastal prairie, Freshwater marsh, Marsh & swamp, Valley & foothill grassland, Wetland
Centromadia parryi ssp. parryi	pappose tarplant	Dicots	PDAST4R0P2	39	2	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Chaparral, Coastal prairie, Marsh & swamp, Meadow & seep, Valley & foothill grassland
Charadrius alexandrinus nivosus	western snowy plover	Birds	ABNNB03031	138	2	Threatened	None	G3T3	S2S3	null	CDFW_SSC-Species of Special Concern, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters, Sand shore, Wetland
Charadrius montanus	mountain plover	Birds	ABNNB03100	90	4	None	None	G3	S2S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Chenopod scrub, Valley & foothill grassland
Chloropyron palmatum		Dicots	PDSCR0J0J0	25	3	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho	Chenopod scrub, Meadow

	palmate-bracted bird's-beak										Santa Ana Botanic Garden	& seep, Valley & foothill grassland, Wetland
Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	Insects	IICOL02106	6	2	None	None	G5TH	SH	null	null	Sand shore
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	ABNRB02022	165	2	Threatened	Endangered	G5T2T3	S1	null	BLM_S-Sensitive, NABCI_RWL-Red Watch List, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Riparian forest
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Dicots	PDCUS01111	6	1	None	None	G5T4?	SH	2B.2	null	Marsh & swamp, Wetland
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Insects	IICOL48011	271	24	Threatened	None	G3T2	S2	null	null	Riparian scrub
Downingia pusilla	dwarf downingia	Dicots	PDCAM060C0	132	6	None	None	GU	S2	2B.2	null	Valley & foothill grassland, Vernal pool, Wetland
Egretta thula	snowy egret	Birds	ABNGA06030	20	1	None	None	G5	S4	null	IUCN_LC-Least Concern	Marsh & swamp, Meadow & seep, Riparian forest, Riparian woodland, Wetland
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	180	18	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
Elderberry Savanna	Elderberry Savanna	Riparian	CTT63440CA	4	3	None	None	G2	S2.1	null	null	Riparian scrub
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1398	7	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Eryngium jepsonii	Jepson's coyote-thistle	Dicots	PDAPI0Z130	19	2	None	None	G2	S2	1B.2	null	Valley & foothill grassland, Vernal pool
Extriplex joaquinana	San Joaquin spearscale	Dicots	PDCHE041F3	127	9	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland
Falco columbarius	merlin	Birds	ABNKD06030	37	6	None	None	G5	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Estuary, Great Basin grassland, Valley & foothill grassland
Fritillaria agrestis	stinkbells	Monocots	PMLIL0V010	32	2	None	None	G3	S3	4.2	null	Chaparral, Cismontane woodland, Pinon & juniper woodlands, Ultramafic, Valley & foothill grassland
Gonidea angulata	western ridged mussel	Mollusks	IMBIV19010	143	1	None	None	G3	S1S2	null	null	Aquatic

Gratiola heterosepala	Boggs Lake hedge-hyssop	Dicots	PDSCR0R060	99	1	None	Endangered	G2	S2	1B.2	BLM_S-Sensitive	Freshwater marsh, Marsh & swamp, Vernal pool, Wetland
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Riparian	CTT61410CA	56	1	None	None	G2	S2.1	null	null	Riparian forest
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Dicots	PDMAL0H0R3	173	10	None	None	G5T3	S3	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Freshwater marsh, Marsh & swamp, Wetland
Lasionycteris noctivagans	silver-haired bat	Mammals	AMACC02010	139	1	None	None	G5	S3S4	null	IUCN_LC-Least Concern, WBWG_M-Medium Priority	Lower montane coniferous forest, Oldgrowth, Riparian forest
Lasiurus cinereus	hoary bat	Mammals	AMACC05030	238	2	None	None	G5	S4	null	IUCN_LC-Least Concern, WBWG_M-Medium Priority	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest
Lasthenia chrysantha	alkali-sink goldfields	Dicots	PDAST5L030	55	1	None	None	G2	S2	1B.1	null	Vernal pool
Laterallus jamaicensis coturniculus	California black rail	Birds	ABNME03041	303	1	None	Threatened	G3G4T1	S1	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_NT-Near Threatened, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Legenere limosa	legenere	Dicots	PDCAM0C010	83	7	None	None	G2	S2	1B.1	BLM_S-Sensitive, SB_UCBG-UC Botanical Garden at Berkeley	Vernal pool, Wetland
Lepidium latipes var. heckardii	Heckard's pepper-grass	Dicots	PDBRA1M0K1	14	7	None	None	G4T1	S1	1B.2	null	Valley & foothill grassland, Vernal pool
Lepidurus packardi	vernal pool tadpole shrimp	Crustaceans	ICBRA10010	324	26	Endangered	None	G4	S3S4	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Lilaeopsis masonii	Mason's lilaeopsis	Dicots	PDAPI19030	198	1	None	Rare	G2	S2	1B.1	null	Freshwater marsh, Marsh & swamp, Riparian scrub, Wetland
Linderiella occidentalis	California linderiella	Crustaceans	ICBRA06010	508	42	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
Melospiza melodia	song sparrow ("Modesto" population)	Birds	ABPBXA3010	92	10	None	None	G5	S3?	null	CDFW_SSC-Species of Special Concern	null
Myrmosula pacifica	Antioch multilid wasp	Insects	IIHYM15010	3	1	None	None	GH	SH	null	null	Interior dunes
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Dicots	PDPLM0C0E1	64	2	None	None	G4T2	S2	1B.1	null	Cismontane woodland, Lower montane coniferous forest, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
Neostapfia colusana	Colusa grass	Monocots	PMPOA4C010	66	3	Threatened	Endangered	G1	S1	1B.1	null	Vernal pool, Wetland
Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	Herbaceous	CTT44120CA	21	1	None	None	G1	S1.1	null	null	Vernal pool, Wetland
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	Herbaceous	CTT44110CA	126	8	None	None	G3	S3.1	null	null	Vernal pool, Wetland
Nycticorax nycticorax		Birds	ABNGA11010	37	4	None	None	G5	S4	null	IUCN_LC-Least Concern	Marsh & swamp, Riparian forest,

	black-crowned night heron											Riparian woodland, Wetland
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Fish	AFCHA0209K	31	5	Threatened	None	G5T2Q	S2	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Oncorhynchus tshawytscha pop. 6	chinook salmon - Central Valley spring-run ESU	Fish	AFCHA0205A	13	1	Threatened	Threatened	G5	S2	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Oncorhynchus tshawytscha pop. 7	chinook salmon - Sacramento River winter-run ESU	Fish	AFCHA0205B	2	1	Endangered	Endangered	G5	S1	null	AFS_EN-Endangered	Aquatic, Sacramento/San Joaquin flowing waters
Phalacrocorax auritus	double-crested cormorant	Birds	ABNFD01020	39	3	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Riparian forest, Riparian scrub, Riparian woodland
Plagiobothrys hystriculus	bearded popcornflower	Dicots	PDBOR0V0H0	15	1	None	None	G2	S2	1B.1	null	Valley & foothill grassland, Vernal pool, Wetland
Plegadis chihi	white-faced ibis	Birds	ABNGE02020	20	1	None	None	G5	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marsh & swamp, Wetland
Pogonichthys macrolepidotus	Sacramento splittail	Fish	AFCJB34020	15	1	None	None	GNR	S3	null	AFS_VU-Vulnerable, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered	Aquatic, Estuary, Freshwater marsh, Sacramento/San Joaquin flowing waters
Progne subis	purple martin	Birds	ABPAU01010	71	10	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Broadleaved upland forest, Lower montane coniferous forest
Puccinellia simplex	California alkali grass	Monocots	PMPOA53110	80	8	None	None	G3	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool
Riparia riparia	bank swallow	Birds	ABPAU08010	298	1	None	Threatened	G5	S2	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Riparian scrub, Riparian woodland
Sagittaria sanfordii	Sanford's arrowhead	Monocots	PMALI040Q0	126	25	None	None	G3	S3	1B.2	BLM_S-Sensitive	Marsh & swamp, Wetland
Sidalcea keckii	Keck's checkerbloom	Dicots	PDMAL110D0	50	2	Endangered	None	G2	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Cismontane woodland, Ultramafic, Valley & foothill grassland
Spirinchus thaleichthys	longfin smelt	Fish	AFCHB03010	46	1	Candidate	Threatened	G5	S1	null	null	Aquatic, Estuary
Symphyotrichum lentum	Suisun Marsh aster	Dicots	PDASTE8470	175	1	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_USDA-US Dept of Agriculture	Brackish marsh, Freshwater marsh, Marsh & swamp, Wetland
Taxidea taxus	American badger	Mammals	AMAJF04010	594	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes,

												Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Thamnophis gigas	giant gartersnake	Reptiles	ARADB36150	366	87	Threatened	Threatened	G2	S2	null	IUCN_VU-Vulnerable	Marsh & swamp, Riparian scrub, Wetland
Trifolium hydrophilum	saline clover	Dicots	PDFAB400R5	56	8	None	None	G2	S2	1B.2	null	Marsh & swamp, Valley & foothill grassland, Vernal pool, Wetland
Tuctoria mucronata	Crampton's tuctoria or Solano grass	Monocots	PMPOA6N020	4	2	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Valley & foothill grassland, Vernal pool, Wetland
Vireo bellii pusillus	least Bell's vireo	Birds	ABPBW01114	503	2	Endangered	Endangered	G5T2	S2	null	IUCN_NT-Near Threatened, NABCI_YWL-Yellow Watch List	Riparian forest, Riparian scrub, Riparian woodland
Xanthocephalus xanthocephalus	yellow-headed blackbird	Birds	ABPBXB3010	13	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Marsh & swamp, Wetland

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

31 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3812166, 3812165, 3812164, 3812156, 3812155, 3812154, 3812146 3812145 and 3812144;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	4.2	S3	G5T3
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	2B.1	S2	G5
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb	May-Nov	1B.2	S2	G3T2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	2B.2	SH	G5T4?
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eryngium jepsonii	Jepson's coyote thistle	Apiaceae	perennial herb	Apr-Aug	1B.2	S2?	G2?
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	S3	G3
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2	S2	G2
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3

Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Juglans hindsii	Northern California black walnut	Juglandaceae	perennial deciduous tree	Apr-May	1B.1	S1	G1
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1	S2	G2
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1	G4T1
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	1B.1	S2	G2
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Plagiobothrys hystriculus	bearded popcornflower	Boraginaceae	annual herb	Apr-May	1B.1	S2	G2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
Tuctoria mucronata	Crampton's tuctoria or Solano grass	Poaceae	annual herb	Apr-Aug	1B.1	S1	G1

Suggested Citation

California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 23 September 2020].

Search the Inventory

- Simple Search
- Advanced Search
- Glossary

Information

- About the Inventory
- About the Rare Plant Program
- CNPS Home Page
- About CNPS
- Join CNPS

Contributors

- The Calflora Database
- The California Lichen Society
- California Natural Diversity Database
- The Jepson Flora Project
- The Consortium of California Herbaria
- CalPhotos

Questions and Comments

rareplants@cnps.org

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: September 23, 2020
Consultation Code: 08ESMF00-2020-SLI-2957
Event Code: 08ESMF00-2020-E-09157
Project Name: River Oaks Marketplace

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code:	08ESMF00-2020-SLI-2957
Event Code:	08ESMF00-2020-E-09157
Project Name:	River Oaks Marketplace
Project Type:	DEVELOPMENT
Project Description:	Development

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.61581420214891N121.53180859451444W

Counties: Sacramento, CA

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Attachment C

Transportation Analysis

RIVER OAKS MARKETPLACE

CIRCULATION AND ACCESS ANALYSIS

DRAFT REPORT

AUGUST 27, 2020

PREPARED FOR:

CITY OF SACRAMENTO

DKS

8950 CAL CENTER DRIVE, SUITE 340, SACRAMENTO, CA 95826 • 916.368.2000 • DKSASSOCIATES.COM

SHAPING A SMARTER TRANSPORTATION EXPERIENCE™

AN EMPLOYEE-OWNED COMPANY

TABLE OF CONTENTS

INTRODUCTION 5

PROJECT DESCRIPTION 5

ENVIRONMENTAL SETTING 5

ROADWAY SYSTEM 5
EXISTING PEDESTRIAN SYSTEM 8
EXISTING BICYCLE SYSTEM 9
TRANSIT SYSTEM 11
STUDY AREA 11
EXISTING INTERSECTION GEOMETRY 11
DATA COLLECTION 11

REGULATORY SETTING 16

CITY OF SACRAMENTO 16
LEVEL OF SERVICE AND QUEUE LENGTH ANALYSIS AND METHODOLOGY 19
RESULTS OF EXISTING CONDITION ANALYSIS 19

BASELINE PROJECTS 20

BASELINE PROJECT TRIP GENERATION 20
BASELINE INTERSECTION GEOMETRY 20
BASELINE TRAFFIC VOLUMES 21
RESULTS OF BASELINE CONDITION ANALYSIS 23

PROJECT TRAVEL CHARACTERISTICS 24

TRIP GENERATION 24
7-ELEVEN 25
MCDONALDS 26
DUTCH BROTHERS 26
CAR WASH 26
INTERNAL TRIPS 26
PASS-BY TRIPS 27
VEHICULAR TRIP GENERATION ESTIMATES 27
TRIP DISTRIBUTION 27

THRESHOLDS OF SIGNIFICANCE 30

INTERSECTIONS – CITY OF SACRAMENTO 30
TRANSIT 30
BICYCLE FACILITIES 30

PEDESTRIAN CIRCULATION 30
CONSTRUCTION-RELATED TRAFFIC IMPACTS 30

BASELINE PLUS PROJECT TRAFFIC CONDITIONS 31

BASELINE PLUS PROJECT INTERSECTION GEOMETRY 31
BASELINE PLUS PROJECT TRAFFIC VOLUMES 31
RESULTS OF BASELINE PLUS PROJECT CONDITION ANALYSIS 34
IMPACTS AND MITIGATION MEASURES 34

ON-SITE OPERATIONS REVIEW AND QUEUING 36

INTERSECTION AND DRIVEWAY SPACING 36
INTERSECTION 9 – WEST EL CAMINO AVENUE AND DRIVE 1 37
INTERSECTION 10 – DRIVE 2 AND ORCHARD LANE 37
INTERSECTION 11 – ORCHARD COURT AND DRIVE 1 38
CUL-DE-SAC – ORCHARD COURT AND DRIVE 3 38
DRIVEWAY THROAT LENGTHS 38
INTERSECTION 9 – WEST EL CAMINO AVENUE and DRIVE 1 38
INTERSECTION 11 – ORCHARD COURT AND DRIVE 1 38
CUL-DE-SAC – ORCHARD COURT AND DRIVE 3 38
DRIVE-THRU QUEUEING ANALYSIS 38
MCDONALDS 38
DUTCH BROTHERS 39
CAR WASH 39
VEHICULAR CIRCULATION PATTERNS 39
BICYCLE ACCESS 39
PEDESTRIAN ACCESS 39
PROJECT SITE 39
ORCHARD DRIVE PEDESTRIAN CROSSINGS 40
ON-SITE TRUCK CIRCULATION PLAN 40
ACCESS TO THE VACANT PARCEL TO THE WEST 40
SUMMARY OF RECOMMENDATIONS 40

BASELINE PLUS PROJECT WITH RECOMMENDATIONS TRAFFIC CONDITIONS 42

BASELINE PLUS PROJECT WITH RECOMMENDATIONS TRIP DISTRIBUTION 42
BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION GEOMETRY 42
BASELINE PLUS PROJECT TRAFFIC VOLUMES 42
RESULTS OF BASELINE PLUS PROJECT WITH RECOMMENDATIONS CONDITION ANALYSIS 46

VMT ANALYSIS 46

VMT IMPACT CRITERIA – SB 743 46
RETAIL CENTER CHARACTERISTICS 47
PROJECT ENVIRONS AND CHARACTERISTICS 47
NEARBY LAND USES 48
PROJECT COMPONENTS 48

PROJECT TRAVEL PATTERNS 48
SUMMARY 48

LIST OF FIGURES

FIGURE 1. STUDY AREA 6
FIGURE 2. SITE PLAN 7
FIGURE 3. BIKEWAYS 10
FIGURE 4. REGIONAL TRANSIT MAP 12
FIGURE 5. EXISTING INTERSECTION LANE CONFIGURATION 13
FIGURE 6. EXISTING 2020 AM AND PM PEAK HOUR VOLUMES 15
FIGURE 7. VEHICLE LEVEL OF SERVICE EXCEPTION AREAS 17
FIGURE 8. BASELINE INTERSECTION LANE CONFIGURATION 22
FIGURE 9. BASELINE 2020 AM AND PM PEAK HOUR VOLUMES 23
FIGURE 10. STUDY AREA TRIP DISTRIBUTION 28
FIGURE 11. PROJECT DRIVEWAY TRIP DISTRIBUTION 29
FIGURE 12. BASELINE PLUS PROJECT INTERSECTION LANE CONFIGURATION 32
FIGURE 13. BASELINE PLUS PROJECT 2020 AM AND PM PEAK HOUR VOLUMES 33
FIGURE 14. SITE CIRCULATION RECOMMENDATIONS 41
FIGURE 15. PROJECT DRIVEWAY TRIP DISTRIBUTION WITH RECOMMENDATIONS 43
FIGURE 16. BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION LANE CONFIGURATION 44
FIGURE 17. BASELINE PLUS PROJECT WITH RECOMMENDATIONS 2020 AM AND PM PEAK HOUR VOLUMES 45

LIST OF TABLES

TABLE 1. INTERSECTION LEVEL OF SERVICE 19
TABLE 2. EXISTING INTERSECTION OPERATION ANALYSIS 20
TABLE 3. BASELINE PROJECT COMPONENTS AND ASSOCIATED ITE LAND USE CATEGORIES 21
TABLE 4. BASELINE PROJECT TRIP GENERATION 21
TABLE 5. BASELINE INTERSECTION OPERATION ANALYSIS 24
TABLE 6. PROJECT COMPONENTS AND ASSOCIATED ITE LAND USE CATEGORIES 25
TABLE 7. SINGLE USE TRIP GENERATION 25
TABLE 8. VEHICULAR TRIP GENERATION ESTIMATES 27
TABLE 9. BASELINE PLUS PROJECT INTERSECTION OPERATION ANALYSIS 34
TABLE 10. BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION OPERATION ANALYSIS 46

INTRODUCTION

This transportation analysis addresses circulation and access conditions associated with the proposed River Oaks Marketplace in the City of Sacramento. The analysis focuses on the project's relationship to the City street system, including nearby intersections, the proposed access points, and on-site circulation. The analysis includes consideration of motorized vehicle traffic, transit service, bicyclists, and pedestrians. Quantitative transportation analyses have been conducted for the following scenarios:

- Existing Conditions (2020)
- Baseline Conditions
- Baseline Plus Project Conditions

PROJECT DESCRIPTION

As illustrated in Figure 1, the 5.23-acre project site is located on the northwest corner of West El Camino Avenue and Orchard Lane in the City of Sacramento. The River Oaks Marketplace project consists of 13,657 square feet of commercial space. The project plan shows uses that include a 7-Eleven (comprised of a Community Market, Restaurant, and Fuel Station), a McDonald's Restaurant with Drive-Through, a Dutch Brothers Coffee Shop with Drive-Through, and a Car Wash. Adjacent properties include The Cove residential development across Orchard Lane to the east (currently under construction and partially occupied), The Core Natomas apartments under construction to the north across Orchard Court, and a vacant parcel to the west.

Figure 2 shows the project site plan. Access is proposed to West El Camino Avenue (right-in / right-out), Orchard Lane (full access), and Orchard Court at two locations (full access).

ENVIRONMENTAL SETTING

The roadway, transit, bicycle, and pedestrian transportation systems within the study area are described below.

ROADWAY SYSTEM

The roadway system near the proposed project is described below.

El Camino Avenue is an east-west arterial roadway, extending from El Centro Road to the west to Fair Oaks Boulevard to the east. It accommodates two to four through lanes. In the project vicinity, it is known as West El Camino Avenue and has two through lanes in each direction. To the west, it provides access to I-80 via a full interchange immediately west of the site. To the east, it provides access to I-5 via a partial interchange (northbound exit, southbound entrance) about 1.0 miles east of the site. West El Camino Avenue has signalized intersections with the I-80 ramps, Orchard Lane, West River Drive / North Cove Drive, and Gateway Oaks Drive.

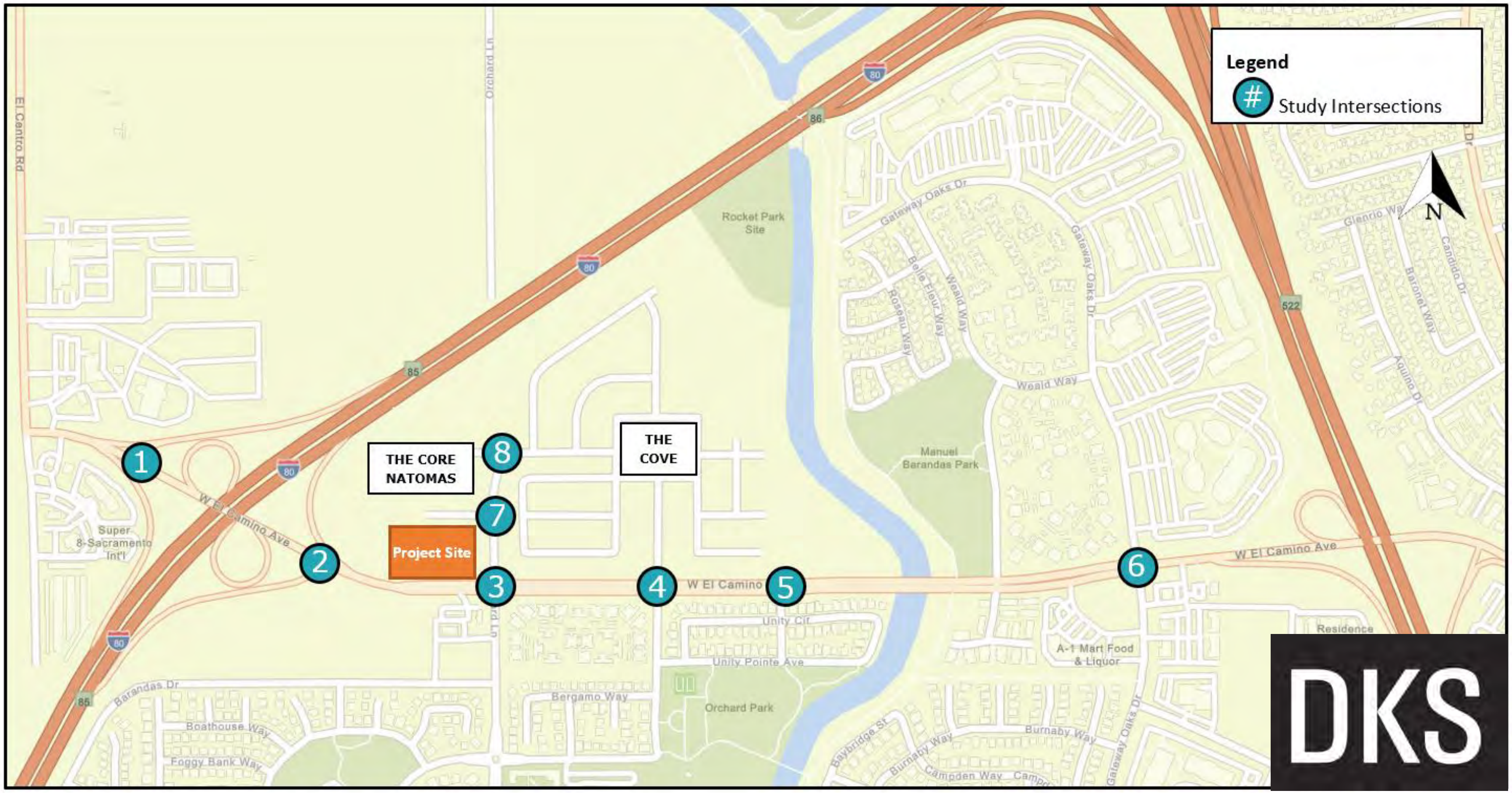


FIGURE 1. STUDY AREA

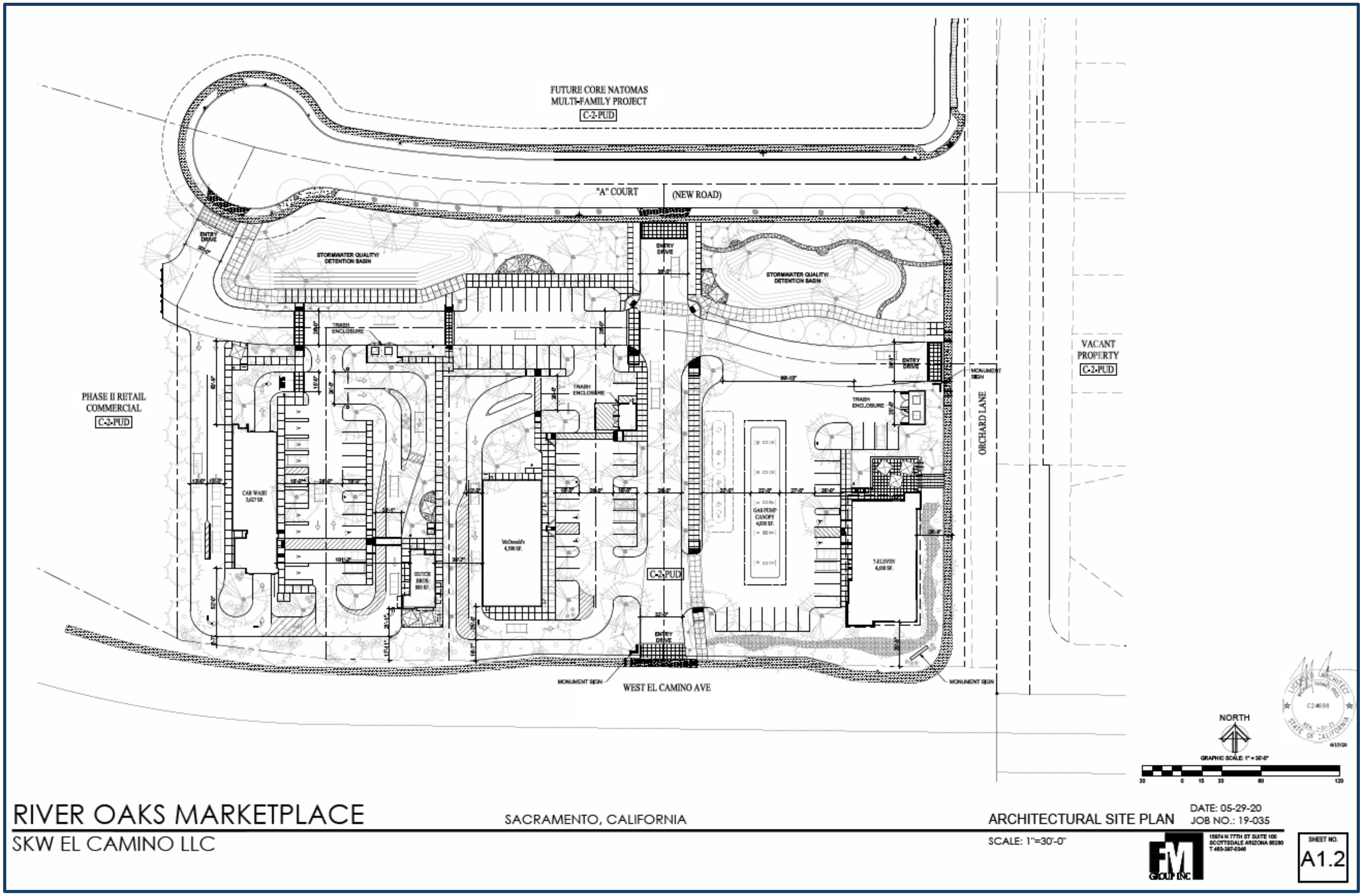


FIGURE 2. SITE PLAN

El Centro Road is a two- to four-lane north-south arterial roadway at the western terminus of West El Camino Avenue. To the south, it terminates at a cul-de-sac at I-80. To the north, it extends north of Del Paso Road, and becomes Bayou Way as it curves to the west to parallel I-5. The intersection of El Centro Road and West El Camino Avenue is controlled by stop-signs on the westbound and northbound approaches.

Orchard Lane is a two-lane north-south minor collector that begins at Garden Highway to the south. As part of ongoing construction associated with adjacent development projects, it has recently been completed to a roundabout approximately 700 feet north of West El Camino Avenue. Orchard Lane intersects with Lone Silo Avenue and a driveway to The Core project.

Orchard Court is a local street under construction extending approximately 570 feet west from Orchard Lane to a cul-de-sac.

Lone Silo Avenue is a local residential street that extends easterly from the roundabout at Orchard Lane for about 600 feet to a T-intersection at Bathford Street.

West River Drive is a two-lane local street that begins at West El Camino Avenue. It proceeds southerly for about 0.2 miles, and then turns westerly and crosses Orchard Lane. West River Drive continues westerly through a residential area to its terminus at Wheelhouse Avenue.

North of West El Camino Avenue, West River Drive becomes North Cove Drive, a local residential street that extends northerly for about 600 feet to a T-intersection with Endsley Avenue. As part of The Cove development, a traffic signal was recently installed at the intersection of West El Camino Avenue, West River Drive, and North Cove Drive.

Unity Park Street is a two-lane local street that begins at West El Camino Avenue. It proceeds southerly for about 0.1 miles to its terminus at Unity Pointe Avenue. At West El Camino Avenue, turning movements are limited to right-in / right-out at a stop-sign controlled intersection.

North of West El Camino Avenue, Unity Park Street will extend northerly as a future street into The Cove. It is referred to as **“P” Street** in this analysis. At West El Camino Avenue, turning movements will be limited to right-in / right-out at a stop-sign controlled intersection.

Gateway Oaks Drive is a north-south minor collector located about 0.7 miles east of the site. The roadway generally has one travel lane in each direction north of its signalized intersection with West El Camino Avenue, and two travel lanes in each direction to the south. Gateway Oaks Drive serves residential development on its west side and office development on its east side. To the south, it extends to Garden Highway. To the north, it extends to the Natomas Main Drainage Canal.

EXISTING PEDESTRIAN SYSTEM

The pedestrian system in the site vicinity consists of sidewalks on some, but not all, sides of the study area street system.

Adjacent to the site, sidewalks are provided along the north side of West El Camino Avenue. These sidewalks extend through the I-80 interchange to El Centro Road to the west, and beyond the I-5 interchange to the east. On the south side of West El Camino Avenue, sidewalks begin about 250 feet west of Orchard Lane (along the Arco / AM-PM store) and continue to the east. Marked crosswalks are provided on all legs of the signalized West El Camino Avenue / Orchard Lane intersection.

Sidewalks have recently been constructed along the east side of Orchard Lane north of West El Camino Avenue. Sidewalks along the west side of Orchard Lane north of West El Camino Avenue will be constructed as adjacent development occurs. Similarly, sidewalks will be constructed on both sides of Orchard Court.

Continuous sidewalks are provided on both sides of West River Drive, Gateway Oaks Drive and Unity Park Street. Continuous sidewalks are provided on Orchard Lane south of West El Camino Avenue. On El Centro Road in the site vicinity, sidewalks are provided on the east side of the roadway from the I-80 cul-de-sac to about 600 feet north of West El Camino Avenue.

EXISTING BICYCLE SYSTEM

Figure 3 illustrates the existing bicycle system in the site vicinity. On-street bikeways currently exist on:

- West El Camino Avenue from El Centro Road to the I-5 interchange.
- Orchard Lane from Lone Silo Avenue to Garden Highway (recently constructed north of West El Camino Avenue.
- Gateway Oaks Drive from the Natomas Main Drainage Canal to Garden Highway.
- Garden Highway from Orchard Lane to Gateway Oaks Drive.
- Barandas Drive from Orchard Lane to West River Drive.
- West River Drive from Orchard Lane to west of Barandas Drive.

Off-street bikeways currently include:

- An east-west path from Orchard Lane to West River Drive, extending approximately from Barandas Drive to West River Drive.
- A north-south path on the east side of the Natomas Main Drainage Canal. To the south, it continues to Garden Highway and Natomas Oaks Park. To the north, it crosses I-80 into North Natomas.

FIGURE 3. BIKEWAYS

Source: City of Sacramento Bikeway User Map, Bicycle master Plan amended on Aug 14, 2018.

TRANSIT SYSTEM

Regional Transit (RT) service in the site vicinity is illustrated in Figure 4. The closest bus route is Route 88 (West El Camino), which operates along West El Camino Avenue, Gateway Oaks Drive, and Garden Highway. To the east Route 88 extends along West El Camino Avenue to the Arden / Del Paso light rail station. To the south Route 88 extends along Gateway Oaks Drive, Garden Highway, and I-5 to Downtown Sacramento. Route 88 provides weekday, Saturday, and Sunday service.

STUDY AREA

The following intersections are included in the study area and shown in Figure 1:

1. West El Camino Avenue & I-80 Westbound Ramps
2. West El Camino Avenue & I-80 Eastbound Ramps
3. West El Camino Avenue & Orchard Lane
4. West El Camino Avenue & West River Drive / North Cove Drive
5. West El Camino Avenue & Unity Park Street / "P" Street
6. West El Camino Avenue & Gateway Oaks Drive
7. Orchard Court & Orchard Lane (under construction)
8. Lone Silo Avenue & Orchard Lane (under construction)

EXISTING INTERSECTION GEOMETRY

Existing intersection geometry (number of approach lanes and traffic control) is illustrated in Figure 5.

DATA COLLECTION

Peak period intersection turning movement counts were conducted for the AM weekday peak period (7:00 to 9:00 AM) and the PM weekday peak period (4:00 to 6:00 PM) on Thursday, February 6, 2020 at intersections 1 and 2 (freeway ramps). These counts were conducted on behalf of the City as part of the interchange monitoring program.

Due to the economic and travel disruptions of the COVID-19 pandemic, it was not feasible to conduct traffic counts at the other intersections. Earlier counts for intersections 1 through 6 conducted on Thursday, November 16, 2017, were available.

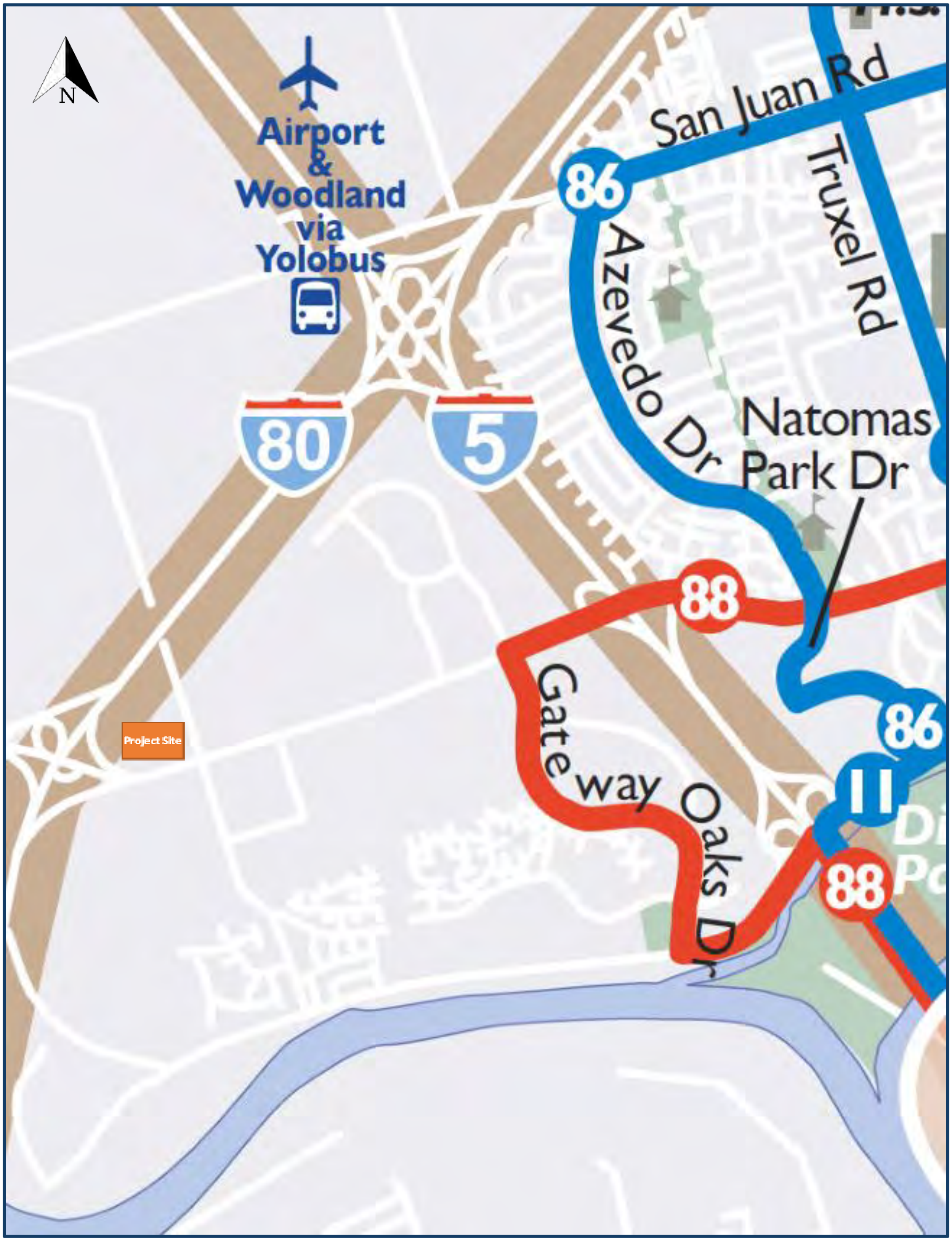


FIGURE 4. REGIONAL TRANSIT MAP

Source: Sacramento Regional Transit Bus & Light Rail System Map

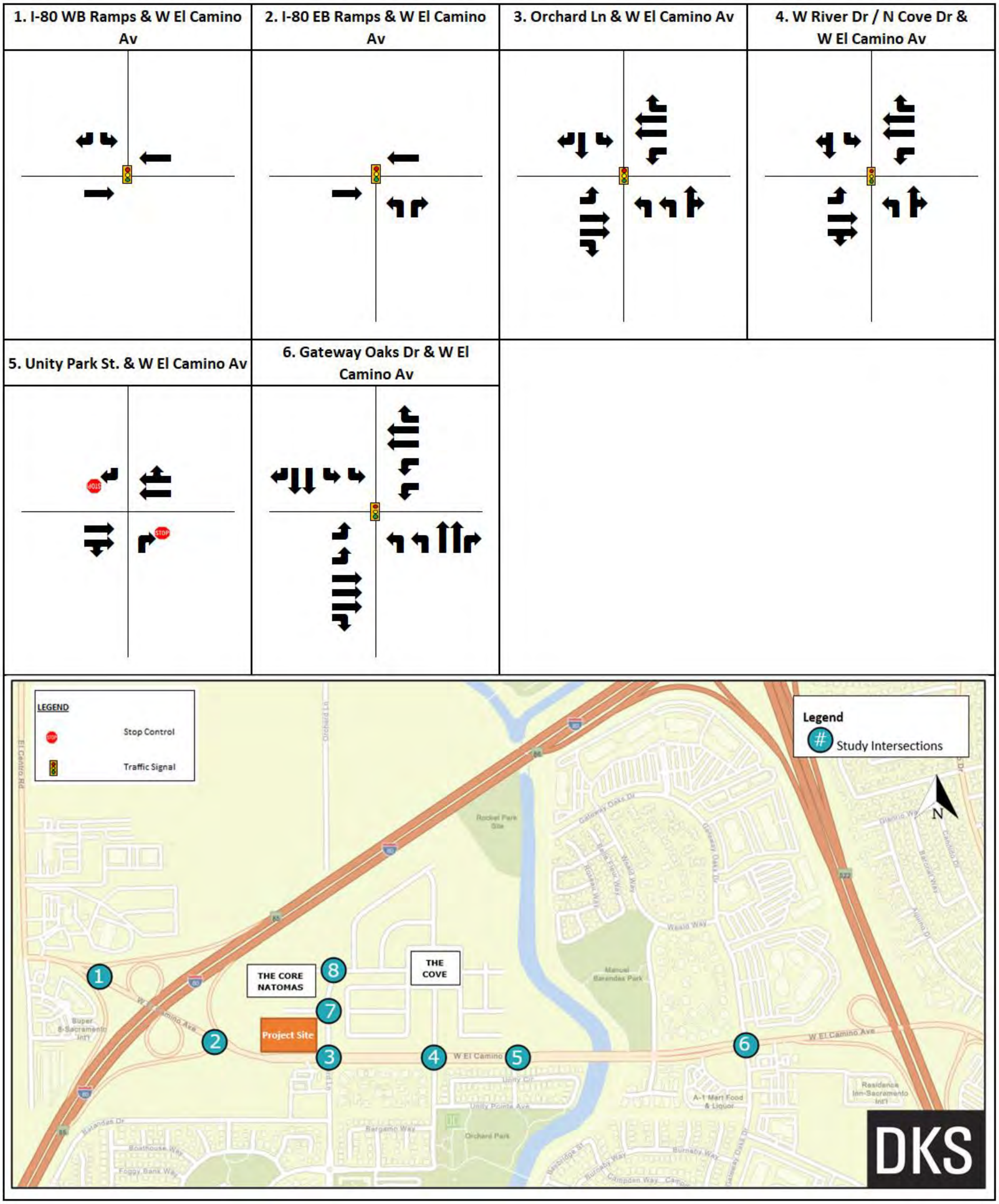


FIGURE 5. EXISTING INTERSECTION LANE CONFIGURATION

Estimates of intersection turning movement traffic volumes on Tuesday through Thursday February 2020 weekdays were obtained from StreetLight for intersections 1 through 6. StreetLight uses anonymous cell phone traveler data and proprietary algorithms to estimate hourly traffic volumes.

The 2017 counts, 2020 counts, and StreetLight estimates were evaluated and compared:

- At intersections 1 and 2, the AM peak hour counts from 2020 were 2 to 8 percent higher than 2017. They were 0 to 2 percent higher in the PM peak hour.
- The StreetLight estimates included volumes on the north legs of intersections 3 and 4 associated with Cove residents and construction traffic.
- Compared to 2017 data, the StreetLight estimates were generally lower, except at the freeway interchange.

Based upon this comparison, estimated 2020 "existing" traffic volumes were computed as follows:

- At intersections 1 and 2, the 2020 counts were utilized.
- At intersections 3 through 6, the 2017 counts were utilized, and adjusted as follows:
    - At intersections 3 and 4, traffic volumes entering and exiting the north legs were derived from the StreetLight estimates.
    - At intersections 3 through 6, eastbound and westbound volumes were increased based upon the difference between 2017 and 2020 counts west of Orchard Lane. These differences were 108 and 131 vehicles per hour eastbound and westbound, respectively in the AM peak hour. During the PM peak hour, the differences were 9 and 0 vehicles per hour eastbound and westbound, respectively.

Figure 6 illustrates the existing 2020 peak hour traffic volumes used in the analysis. Detailed traffic count data are included in the appendix.

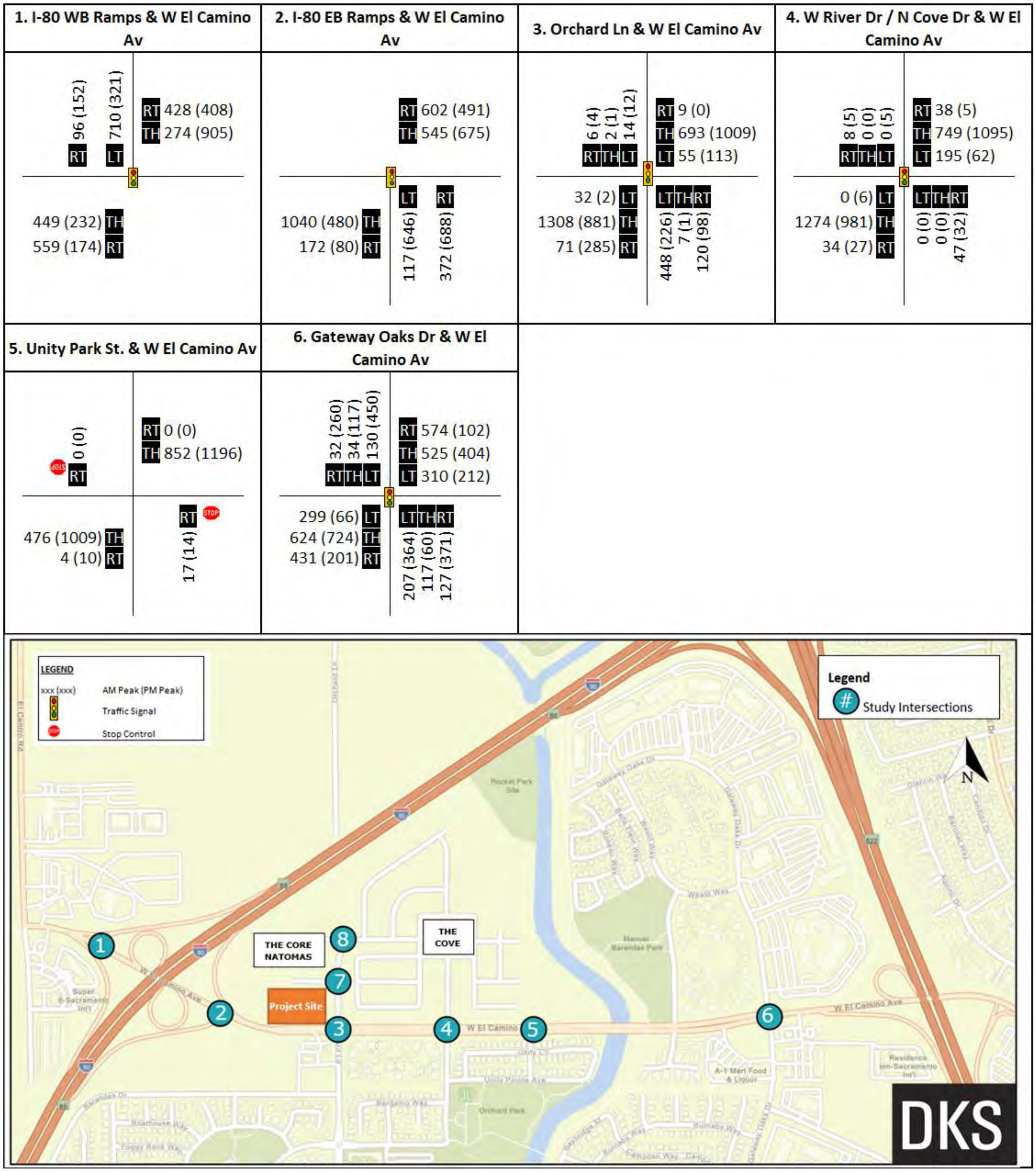


FIGURE 6. EXISTING 2020 AM AND PM PEAK HOUR VOLUMES

REGULATORY SETTING

The site of the project, along with the site of the Core Natomas apartments and the vacant property to the west, were previously reviewed as part of the Park El Camino PUD (adopted by City Council on September 13, 2005). Accordingly, this circulation and access analysis reviews both LOS and VMT. The prior LOS review specified the installation of traffic signals at intersections 1 and 2 (freeway ramps) under baseline plus project conditions. These traffic signals have been installed.

CITY OF SACRAMENTO

The Mobility Element of the Sacramento 2035 General Plan outlines goals and policies that coordinate the transportation and circulation system with planned land uses. The following level of service policy has been used in this study, as amended on January 23, 2018:

> Policy M 1.2.2 Level of Service (LOS) Standard. The City shall implement a flexible context sensitive Level of Service (LOS) standard, and will measure traffic operations against the vehicle LOS thresholds established in this policy. The City will measure Vehicle LOS based on the methodology contained in the latest version of the Highway Capacity Manual (HCM) published by the Transportation Research Board. The City's specific vehicle LOS thresholds have been defined based on community values with respect to modal priorities, land use context, economic development, and environmental resources and constraints. As such, the City has established variable LOS thresholds appropriate for the unique characteristics of the City's diverse neighborhoods and communities. The City will strive to operate the roadway network at LOS D or better for vehicles during typical weekday conditions, including AM and PM peak hour with the following exceptions described below and mapped on Figure M-1 (Figure 7):
>
> A. Core Area (Central City Community Plan Area) - LOS F allowed
>
> B. Priority Investment Areas – LOS F allowed
>
> C. LOS E Roadways - LOS E is allowed for the following roadways because expansion of the roadways would cause undesirable impacts or conflict with other community values.
>
> - 65th Street: Elvas Avenue to 14th Avenue
> - Arden Way: Royal Oaks Drive to I-80 Business
> - Broadway: Stockton Boulevard to 65th Street
> - College Town Drive: Hornet Drive to La Rivera Drive
> - El Camino Avenue: I-80 Business to Howe Avenue
> - Elder Creek Road: Stockton Boulevard to Florin Perkins Road
> - Elder Creek Road: South Watt Avenue to Hedge Avenue
> - Fruitridge Road: Franklin Boulevard to SR 99
> - Fruitridge Road: SR 99 to 44th Street

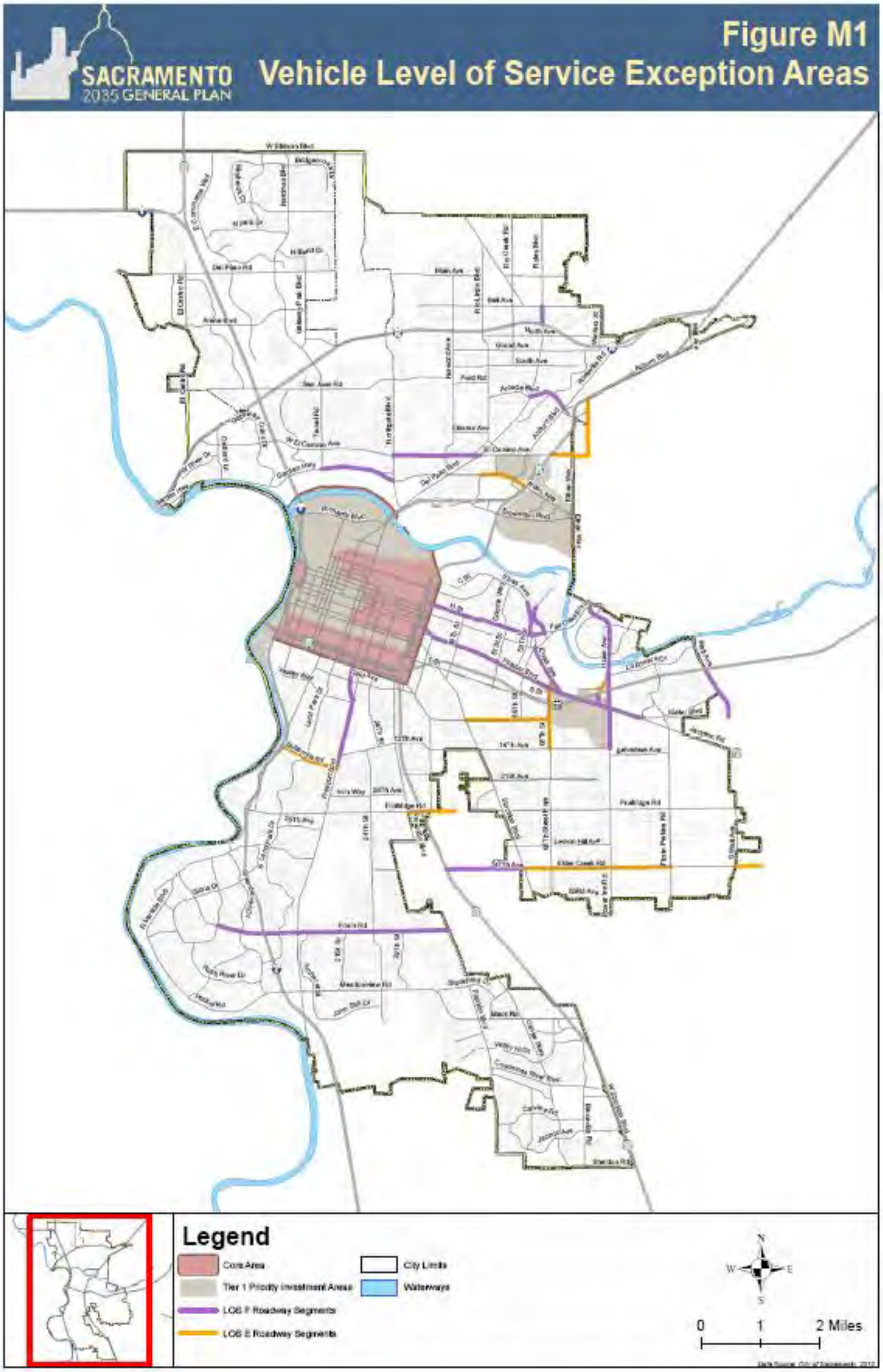


FIGURE 7. VEHICLE LEVEL OF SERVICE EXCEPTION AREAS

- Howe Avenue: El Camino Avenue to Auburn Boulevard
- Sutterville Road: Riverside Boulevard to Freeport Boulevard

LOS E is also allowed on all roadway segments and associated intersections located within ½ mile walking distance of light rail stations.

D. Other LOS F Roadways - LOS F is allowed for the following roadways because expansion of the roadways would cause undesirable impacts or conflict with other community values.

- 47th Avenue: State Route 99 to Stockton Boulevard
- Arcade Boulevard: Marysville Boulevard to Roseville Road
- Carlson Drive: Moddison Avenue to H Street
- Duckhorn Drive: Arena Boulevard to San Juan Road
- El Camino Avenue: Grove Avenue to Del Paso Boulevard
- Elvas Avenue: J Street to Folsom Boulevard
- Elvas Avenue/56th Street: 52nd Street to H Street
- Florin Road: Havenside Drive to Interstate 5
- Florin Road: Freeport Boulevard to Franklin Boulevard
- Florin Road: Interstate 5 to Freeport Boulevard
- Folsom Boulevard: 47th Street to 65th Street
- Folsom Boulevard: Howe Avenue to Jackson Highway
- Folsom Boulevard: US 50 to Howe Avenue
- Freeport Boulevard: Sutterville Road (North) to Sutterville Road (South)
- Freeport Boulevard: 21st Street to Sutterville Road (North)
- Freeport Boulevard: Broadway to 21st Street
- Garden Highway: Truxel Road to Northgate Boulevard
- H Street: Alhambra Boulevard to 45th Street
- H Street 45th: Street to Carlson Drive
- Hornet Drive: US 50 Westbound On-ramp to Folsom Boulevard
- Howe Avenue: US 50 to Fair Oaks Boulevard
- Howe Avenue: US 50 to 14th Avenue
- Raley Boulevard: Bell Avenue to Interstate 80
- San Juan Road: Duckhorn Drive to Truxel Road
- South Watt Avenue: US 50 to Kiefer Boulevard
- West El Camino Avenue: Northgate Boulevard to Grove Avenue

E. If maintaining the above LOS standards would, in the City's judgment be infeasible and/or conflict with the achievement of other goals, LOS E or F conditions may be accepted provided that provisions are made to improve the overall system, promote non vehicular transportation, and/or implement vehicle trip reduction measures as part of a development project or a city-initiated project. Additionally, the City shall not expand the physical capacity of the planned roadway network to accommodate a project beyond that identified in Figure M4 and M4a (2035 General Plan Roadway Classification and Lanes).

LEVEL OF SERVICE AND QUEUE LENGTH ANALYSIS AND METHODOLOGY

Intersection analyses were conducted using a methodology outlined in the Transportation Research Board's Special Report 209, Highway Capacity Manual 6th Edition (HCM 6). The methodology utilized is known as "operational analysis." This procedure calculates an average control delay per vehicle at an intersection and assigns a level of service designation based upon the delay. Table 1 presents the level of service criteria for intersections in accordance with the HCM 6 methodology. In accordance with City of Sacramento policy, at unsignalized intersection, the intersection average delay / LOS is used to determine conformity with City policies.

TABLE 1. INTERSECTION LEVEL OF SERVICE

INTERSECTION LEVEL OF SERVICE CRITERIA		
LEVEL OF SERVICE (LOS)	TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: Highway Capacity Manual 6th Edition, Transportation Research Board.

Queue lengths at intersections and driveways have been estimated based upon the 95th percentile queue. HCM 6 computes the queue length for unsignalized intersections and roundabouts. For signalized intersections, Synchro 10 methodology has been utilized.

RESULTS OF EXISTING CONDITION ANALYSIS

Existing condition intersection analysis results are summarized in Table 2. All the intersections operate at an acceptable LOS D or better.

TABLE 2. EXISTING INTERSECTION OPERATION ANALYSIS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. W. El Camino Ave. & I-80 Westbound Ramps	21.2	C	12.9	B
2. W. El Camino Ave. & I-80 Eastbound Ramps	39.1	D	35.0	D
3. W. El Camino Ave. & Orchard Lane	52.4	D	40.9	D
4. W. El Camino Ave. & W. River Dr. / N. Cove Dr.	37.2	D	39.7	D
5. W. El Camino Ave. & Unity Park St. (avg)	0.1	A	0.1	A
- Northbound	*15.5*	*C*	*12.3*	*B*
6. W. El Camino Ave. & Gateway Oaks Dr.	37.5	D	32.1	C

Source: DKS Associates, 2020.

BASELINE PROJECTS

Immediately adjacent to the project, the following land uses affect circulation and access planning:

- The Cove is a residential development east of Orchard Lane that is currently under construction and partially occupied. At buildout, it will consist of 435 single-family and 156 townhouse dwelling units. The Cove has access via intersections 4, 5, and 8.
- The Core Natomas is a 300-dwelling unit apartment complex north of Orchard Court. It is currently under construction. It will have access via intersection 8 and the cul-de-sac at the west end of Orchard Court.
- A vacant parcel is located west of the Marketplace project. It will have shared access with the Marketplace at Drive 3, and potentially via the cul-de-sac. A 120-room hotel has been assumed as future development on this parcel.

BASELINE PROJECT TRIP GENERATION

Vehicular trip generation of the baseline projects has been estimated using ITE Trip Generation, Tenth Edition. Table 3 summarizes the baseline project components and associated ITE land use codes.

Table 4 summarizes the baseline project trip generation for daily, AM peak hour, and PM peak hour.

BASELINE INTERSECTION GEOMETRY

Baseline intersection geometry (number of approach lanes and traffic control) is illustrated in Figure 8.

TABLE 3. BASELINE PROJECT COMPONENTS AND ASSOCIATED ITE LAND USE CATEGORIES

PROPERTY	COMPONENT	SIZE	ITE LAND USE CODE(S)	ITE USE(S)
THE CORE NATOMAS	Apartments	300 DU	220	Multifamily Housing (Low-Rise)
THE COVE	Single-Family	435 DU	210	Single Family Detached Housing
	Townhouses	156 DU	220	Multifamily Housing (Low-Rise)
VACANT PROPERTY	Hotel[a]	120 Rooms[a]	310	Hotel

[a] Assumed land use for analysis purposes.

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

TABLE 4. BASELINE PROJECT TRIP GENERATION

PROPERTY	COMPONENT	DAILY	AM PEAK HOUR			PM PEAK HOUR		
			ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
THE CORE NATOMAS	Apartments	2,227	31	104	135	99	58	157
THE COVE	Single-Family	4,021	79	235	314	263	154	417
	Townhouses	1,139	17	56	73	55	33	88
	Total	5,160	96	291	387	318	187	505
VACANT PROPERTY	Hotel	1,468	46	34	80	43	44	87

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

BASELINE TRAFFIC VOLUMES

Baseline traffic volumes were calculated by adding the trips associated with the baseline projects (The Cove, The Core Natomas, and hotel) to existing traffic volumes. To address the construction traffic and partial occupancy of the Cove in the existing traffic counts, all traffic entering and exiting the north legs of intersections 3 and 4 was removed from the study area intersections before adding the trips of the baseline projects.

Figure 9 illustrates the baseline peak hour traffic volumes used in the analysis.

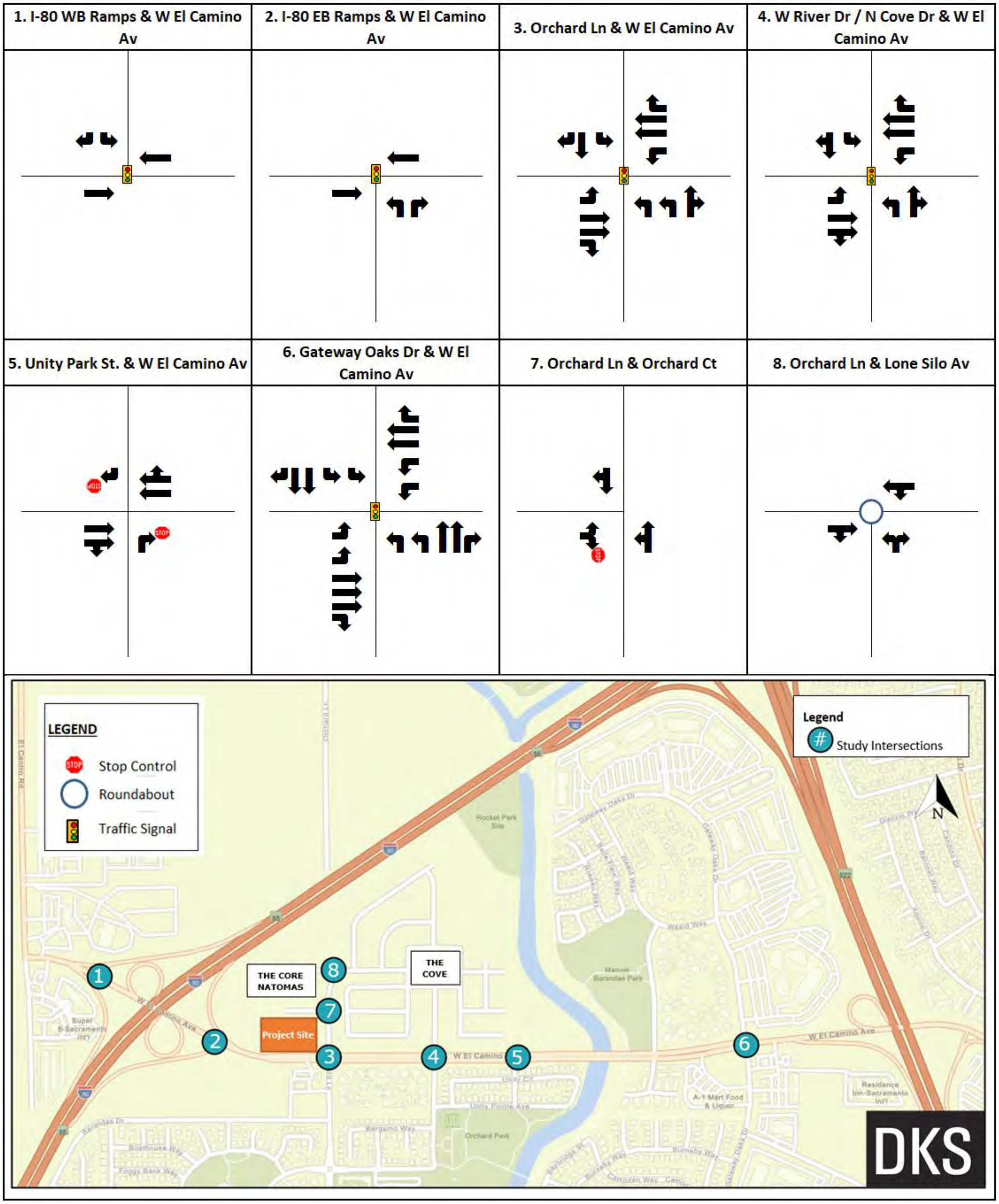


FIGURE 8. BASELINE INTERSECTION LANE CONFIGURATION

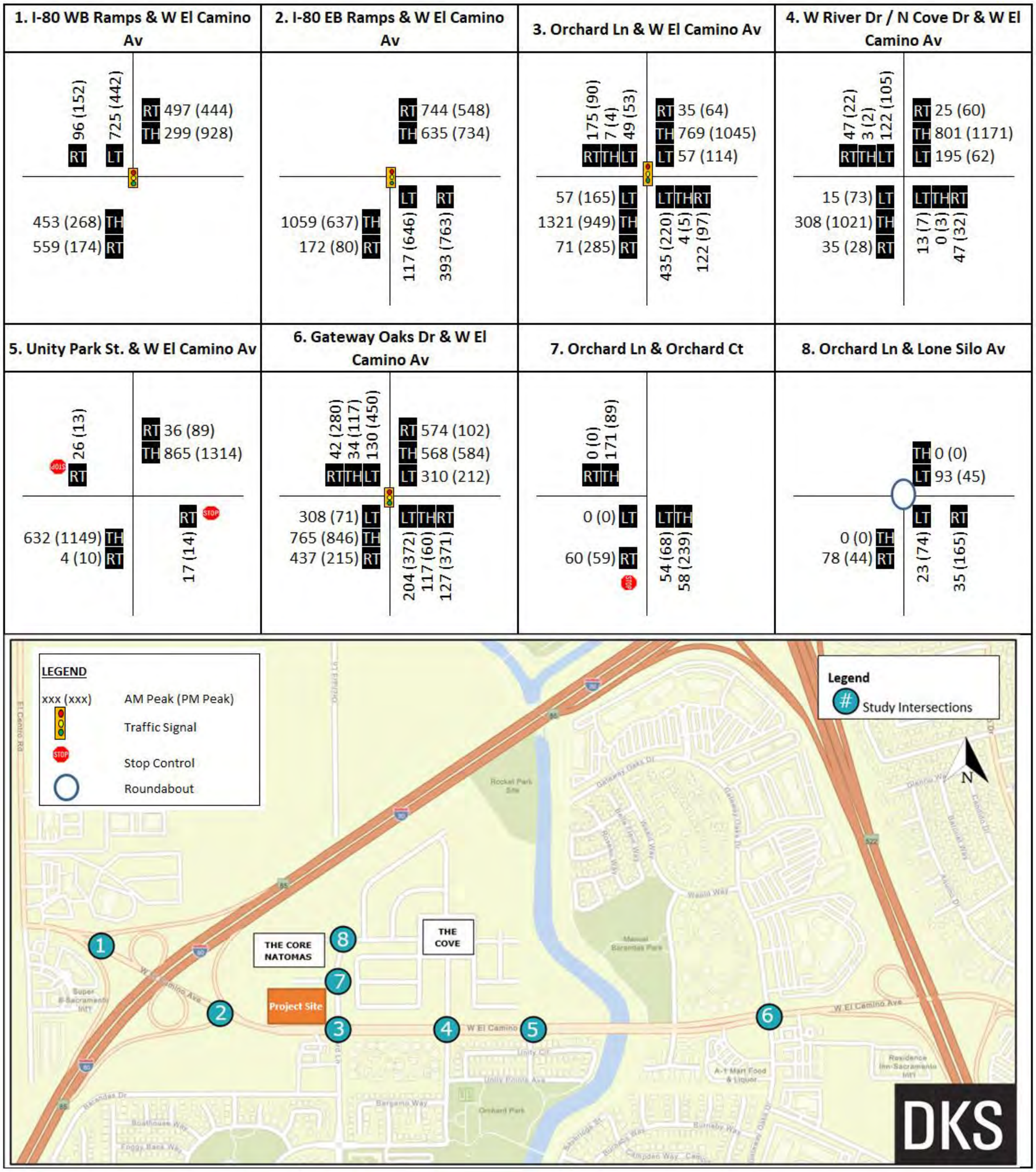


FIGURE 9. BASELINE 2020 AM AND PM PEAK HOUR VOLUMES

RESULTS OF BASELINE CONDITION ANALYSIS

Baseline condition intersection analysis results are summarized in Table 5. All the intersections operate at an acceptable LOS D or better.

TABLE 5. BASELINE INTERSECTION OPERATION ANALYSIS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. W. El Camino Ave. & I-80 Westbound Ramps	21.6	C	18.0	B
2. W. El Camino Ave. & I-80 Eastbound Ramps	43.9	D	42.2	D
3. W. El Camino Ave. & Orchard Lane	48.2	D	49.5	D
4. W. El Camino Ave. & W. River Dr. / N. Cove Dr.	38.9	D	38.2	D
5. W. El Camino Ave. & Unity Park St. (avg)	0.2	A	0.1	A
- Northbound	*16.9*	*C*	*13.1*	*B*
- Southbound	*11.8*	*B*	*14.8*	*B*
6. W. El Camino Ave. & Gateway Oaks Dr.	36.9	D	34.1	C
7. Orchard Ct. & Orchard Ln. (avg)	2.9	A	2.3	A
- Northbound Left	*7.7*	*A*	*7.5*	*A*
- Eastbound	*9.4*	*A*	*8.7*	*A*
8. Lone Silo Ave. & Orchard Ln.	3.3	A	3.8	A

Source: DKS Associates, 2020.

PROJECT TRAVEL CHARACTERISTICS

TRIP GENERATION

Vehicular trip generation of the project has been estimated using the following sources:

- ITE Trip Generation, Tenth Edition.
- ITE Trip Generation Handbook, Second Edition.
- ITE Trip Generation Handbook, Third Edition.
- Literature review of trip generation data for Dutch Brothers and Car Wash uses.

Table 6 summarizes the components of the project and adjacent properties.

Table 7 summarizes the trip generation of the project components as stand-alone uses. No credits have been taken for alternate mode uses, as travel in the area is predominantly auto oriented at this time.

TABLE 6. PROJECT COMPONENTS AND ASSOCIATED ITE LAND USE CATEGORIES

PROPERTY	COMPONENT	SIZE	ITE LAND USE CODE(S)	ITE USE(S)
RIVER OAKS MARKETPLACE	7-Eleven	4,650 SF 20 fueling positions	960	Super Convenience Market / Gas Station
	McDonalds	4,500 SF	934	Fast-Food Restaurant with Drive-Thru
	Dutch Brothers	880 SF	938[a]	Coffee/Donut Shop with Drive-Thru and No Indoor Seating
	Car Wash	3,627 SF 1 Tunnel	948[b]	Automated Car Wash

[a] Limited data; building size out of range.

[b] Limited data; limited time periods.

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

TABLE 7. SINGLE USE TRIP GENERATION

PROPERTY	COMPONENT	DAILY	AM PEAK HOUR			PM PEAK HOUR		
			ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
RIVER OAKS MARKETPLACE	7-Eleven	4,253	234	233	467	195	194	389
	McDonalds	2,119	92	89	181	76	71	147
	Dutch Brothers	1,793	108	107	215	81	81	162
	Car Wash	748	22	22	44	39	39	78
	Total	8,913	456	451	907	391	385	776

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

7-ELEVEN

The 7-Eleven trip generation is calculated from the ITE land use code 960, Super Convenience Market / Gas Station. The multi-variable equations (combining building size and fueling positions) were used for the AM and PM peak hours. The daily value is based upon the average of the daily volumes calculated from building size and fuel position rates.

MCDONALDS

All trip generation is based upon ITE rates for land use code 934, Fast-Food Restaurant with Drive-Thru.

DUTCH BROTHERS

The ITE data for a Coffee/Donut Shop with Drive Thru and No Indoor Seating (Code 938) is limited and inappropriate for Dutch Brothers. The ITE data is based upon three much smaller coffee kiosks of 90 square feet each.

Fehr and Peers Associates collected PM peak hour trip generation data on February 5, 2020, at two Dutch Brothers locations (Roseville and Elk Grove) with similar characteristics. This data has been used by the City in the analysis of a Dutch Brothers project on Northgate Boulevard. The PM peak hour data is shown in Table 7 and will be used for this project.

For the AM peak hour, Crane Transportation Group compiled AM and PM peak hour data at three Dutch Brothers locations in Lodi, Oakley, and Stockton, California on October 3, 2019. Compared to the PM peak hour, the AM peak hour volumes vary from 76 percent to 171 percent. An average value of 133 percent of the PM peak hour was applied to the AM peak hour.

For daily volumes, the ratio of daily trips to peak hour trips (AM and PM combined) from the ITE data was utilized.

CAR WASH

The ITE data for an automated car wash (Code 948) is limited to rates for the PM peak, which are used for the project.

For the AM peak hour, data collected at car washes in Montebello, Newport Beach, and Rialto in 2014 and 2015 were utilized. During the AM peak hour, the volumes varied from 45 to 72 percent of the PM peak hour volumes. An average value of 57 percent of the PM peak hour was applied to the AM peak hour.

For daily volumes, the ratio of daily trips to peak hour trips (AM and PM combined) from the Montebello car wash was utilized.

INTERNAL TRIPS

Because multiple uses are located on the same site, as well as off-site nearby, some patrons may visit more than one land use. This reduces the number of trips at the driveway compared to stand-alone uses, as these trips are typically made as pedestrians. The reduced trips are called internal trips.

Internal trips were calculated for the four River Oak Marketplace uses and The Core Natomas.

Although some pedestrian trips will be made to the project from The Cove, internal trips were not calculated as The Cove is not considered to be part of a mixed-use development. The design of The Cove limits direct access, as a privacy wall has been constructed along Orchard Lane and West El Camino Avenue. No internal trips were calculated for the hotel since the land use is uncertain.

PASS-BY TRIPS

Pass-by trips are trips that access the project site that are already on the roadway network driving past the site. While these trips are counted at the driveways, they are not new trips.

VEHICULAR TRIP GENERATION ESTIMATES

Table 8 summarizes the trip generation estimates. The project is estimated to generate 2,500 new external daily trips, 307 during the AM peak hour, and 199 during the PM peak hour. Additional trip generation information is included in the Appendix.

TABLE 8. VEHICULAR TRIP GENERATION ESTIMATES

	DAILY	AM PEAK HOUR			PM PEAK HOUR		
		ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
RIVER OAKS MARKETPLACE							
1. SINGLE USE TRIPS (SEE TABLE 7)	8,913	456	451	907	391	385	776
2. INTERNAL TRIPS	-3,181	-79	-70	-149	-156	-180	-335
3. DRIVEWAY TRIPS (1. MINUS 2.)	5,731	377	381	758	235	205	441
4. PASS-BY TRIPS	-3,231	-224	-227	-451	-130	-112	-242
5. NEW EXTERNAL TRIPS (3. MINUS 4.)	2,500	153	154	307	106	93	199

Source: ITE Trip Generation, Tenth Edition, 2017; ITE Trip Generation Handbook, Second Edition, 2004; ITE Trip Generation Handbook, Third Edition, 2014; and DKS Associates., 2020.

TRIP DISTRIBUTION

The distribution of trips associated with the proposed project was derived from the regional SACSIM travel model, observations of travel patterns near the site, and knowledge of the proposed access locations associated with the site. Trip distribution varies by time of day and direction of travel. Figure 10 illustrates the trip distribution of the new external trips on the study area network. Figure 11 illustrates the trip distribution at the project driveways.

FIGURE 10. STUDY AREA TRIP DISTRIBUTION

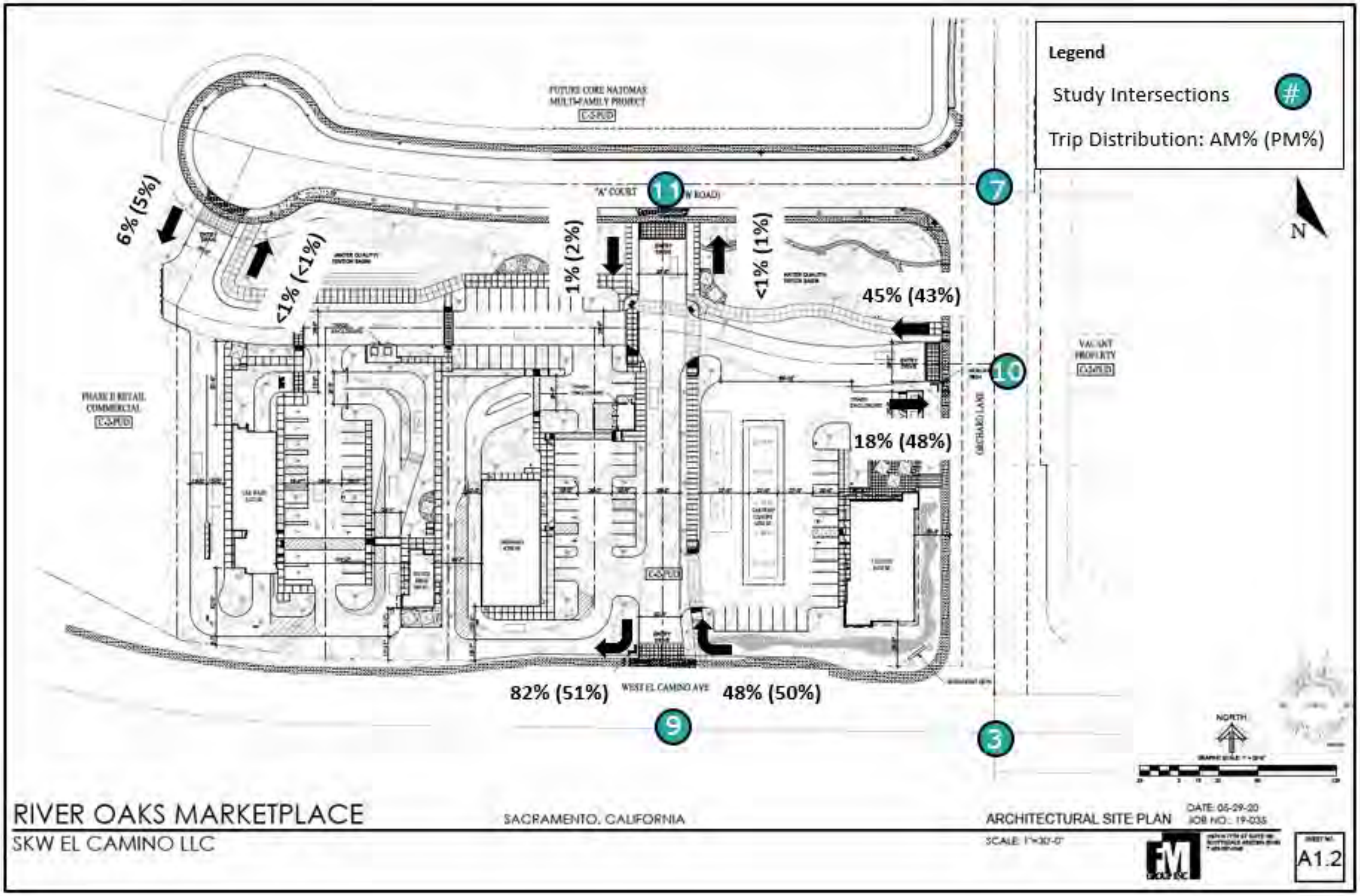


FIGURE 11. PROJECT DRIVEWAY TRIP DISTRIBUTION

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, thresholds of significance adopted by the governing jurisdictions in applicable general plans and previous environmental documents, and professional judgement, a significant impact would occur if the proposed project would:

INTERSECTIONS – CITY OF SACRAMENTO

- The traffic generated by the project degrades LOS from an acceptable LOS (without the project) to an unacceptable LOS (with the project),
- The LOS (without project) is unacceptable and project generated traffic increases the average vehicle delay by 5 seconds or more.
- Note: General Plan Mobility Element Policy M 1.2.2 sets forth definitions for what is considered an acceptable LOS. As previously discussed, Policy M 1.2.2 applies to the study area roadway facilities as follows:
- Intersections - LOS A-D is always to be maintained; provided, LOS E or F may be acceptable if improvements are made to the overall transportation system and/or non-vehicular transportation and transit are promoted as part of the project or a City initiated project.

TRANSIT

- Adversely affect public transit operations,
- Fail to adequately provide access to transit.

BICYCLE FACILITIES

- Adversely affect existing or planned bicycle facilities,
- Fail to adequately provide for access by bicycle.

PEDESTRIAN CIRCULATION

- Adversely affect existing or planned pedestrian facilities,
- Fail to adequately provide for access by pedestrians.

CONSTRUCTION-RELATED TRAFFIC IMPACTS

- Degrade an intersection or roadway to an unacceptable level,
- Cause inconveniences to motorists due to prolonged road closures, or

- Result in increased frequency of potential conflicts between vehicles, pedestrians, and bicyclists.

BASELINE PLUS PROJECT TRAFFIC CONDITIONS

BASELINE PLUS PROJECT INTERSECTION GEOMETRY

Baseline plus project intersection geometry is illustrated in Figure 12.

BASELINE PLUS PROJECT TRAFFIC VOLUMES

Baseline plus project traffic volumes were calculated by adding the trips associated with the project to baseline traffic volumes. Adjustments were made to address internal trips between the project and The Core Natomas, and vehicular trips between the project and The Cove. Figure 13 illustrates the baseline plus project peak hour traffic volumes used in the analysis.

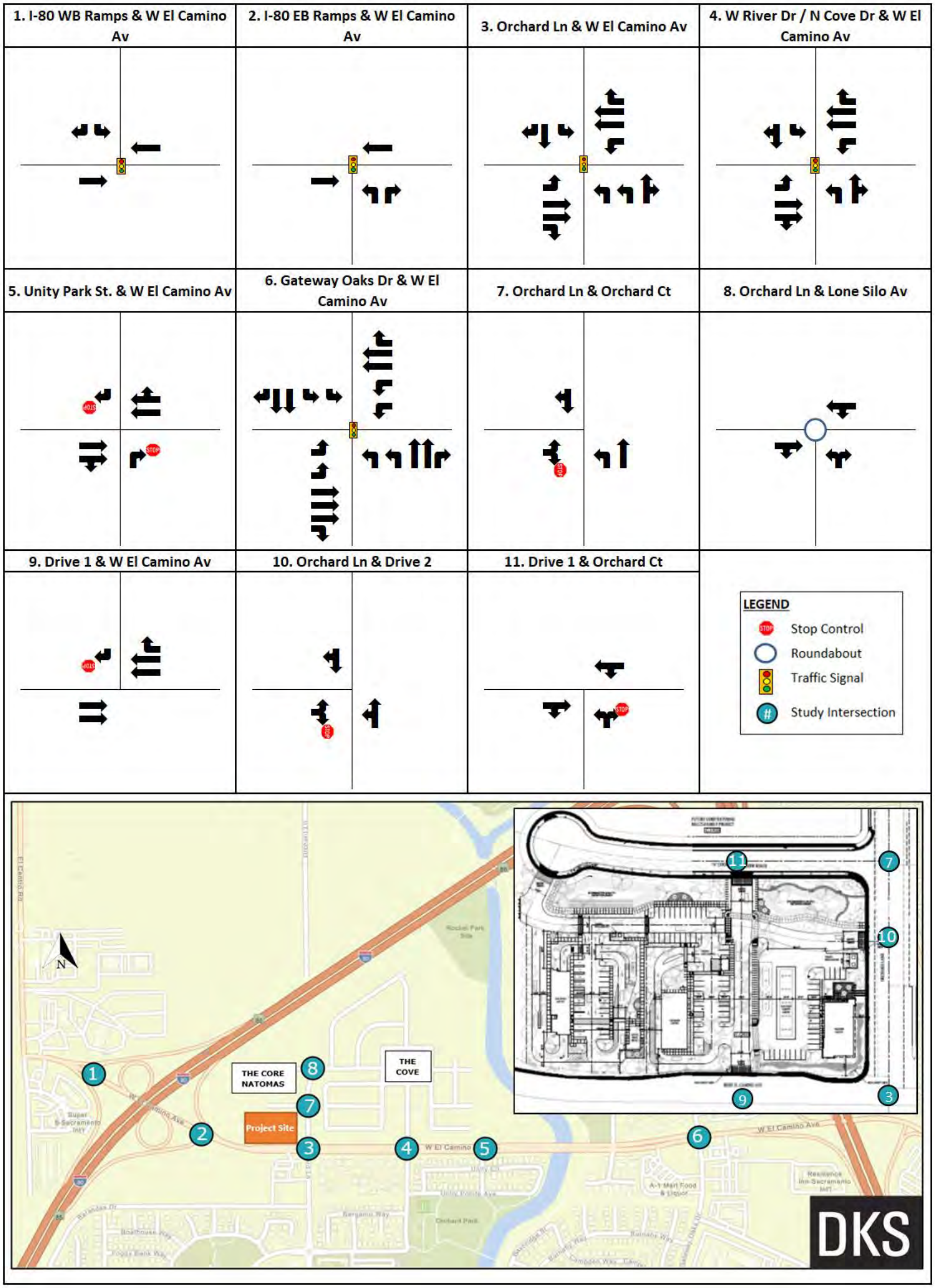


FIGURE 12. BASELINE PLUS PROJECT INTERSECTION LANE CONFIGURATION

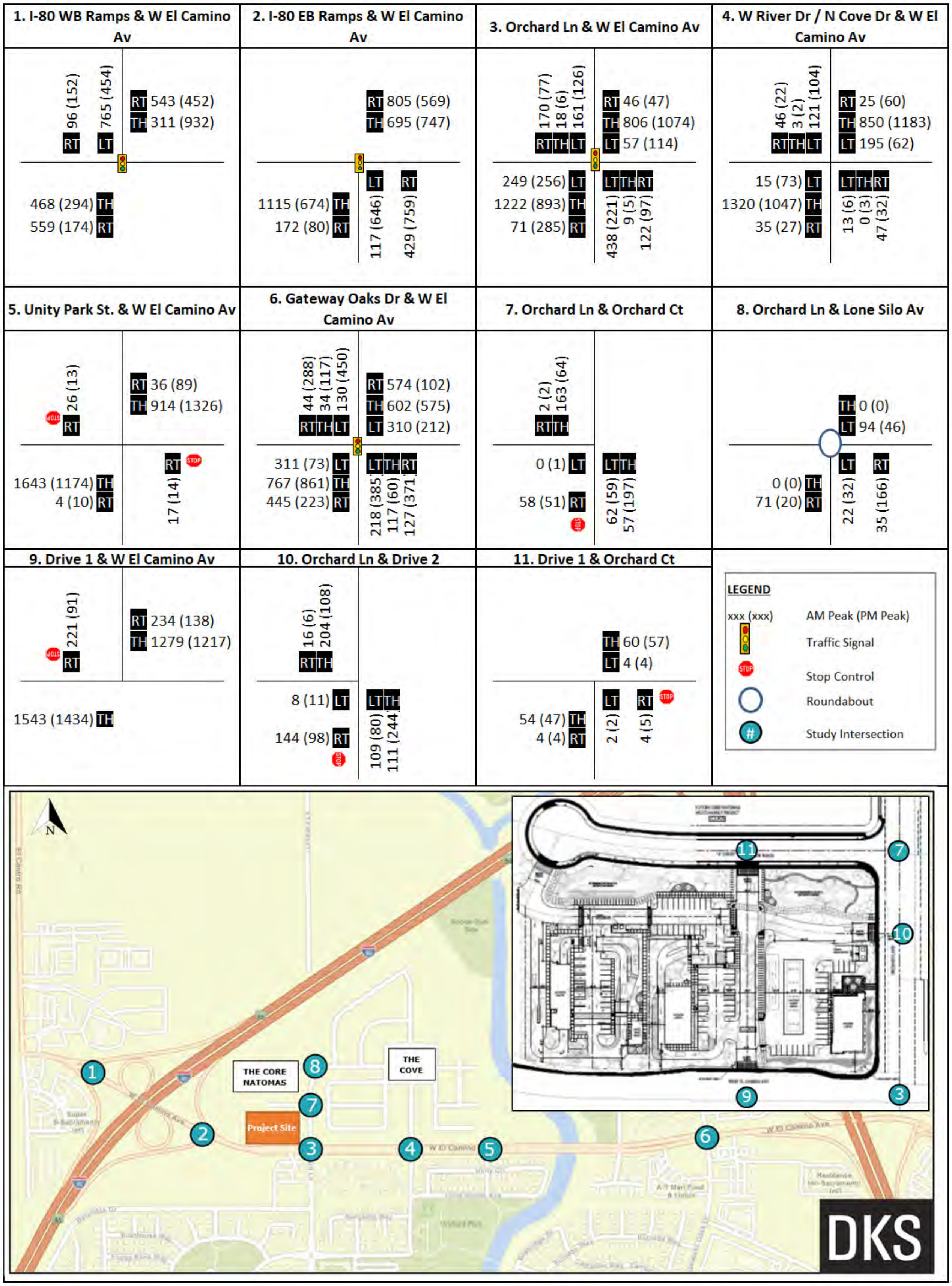


FIGURE 13. BASELINE PLUS PROJECT 2020 AM AND PM PEAK HOUR VOLUMES

RESULTS OF BASELINE PLUS PROJECT CONDITION ANALYSIS

Baseline plus project condition intersection analysis results are summarized in Table 9. All the intersections operate at an acceptable LOS D or better.

TABLE 9. BASELINE PLUS PROJECT INTERSECTION OPERATION ANALYSIS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. W. El Camino Ave. & I-80 Westbound Ramps	23.3	C	18.7	B
2. W. El Camino Ave. & I-80 Eastbound Ramps	54.2	D	42.4	D
3. W. El Camino Ave. & Orchard Lane	49.9	D	42.0	D
4. W. El Camino Ave. & W. River Dr. / N. Cove Dr.	38.1	D	38.2	D
5. W. El Camino Ave. & Unity Park St. (avg)	0.2	A	0.1	A
- *Northbound*	17.0	C	13.3	B
- *Southbound*	12.1	B	14.9	B
6. W. El Camino Ave. & Gateway Oaks Dr.	37.0	D	34.4	C
7. Orchard Ct. & Orchard Ln. (avg)	3.0	A	2.4	A
- Northbound Left	7.7	A	7.4	A
- Eastbound	9.4	A	8.9	A
8. Lone Silo Ave. & Orchard Ln.	3.2	A	3.6	A
9. W. El Camino Ave. & Drive 1 (avg)	1.5	A	0.5	A
- *Southbound Right*	22.9	C	15.4	C
10. Drive 2 & Orchard Ln. (avg)	4.2	A	3.1	A
- *Northbound Left*	7.9	A	7.6	A
- *Eastbound*	10.6	B	9.8	A
11. Orchard Ct. & Drive 1 (avg)	0.7	A	0.8	A
- *Northbound*	8.8	A	8.7	A
- *Westbound Left*	7.3	A	7.3	A

Source: DKS Associates, 2020.

IMPACTS AND MITIGATION MEASURES

Impact 1:

The proposed project would increase traffic volume and delay at study area intersections under the existing plus project scenario. Based on the analysis below, the impact is less than significant.

As summarized in Table 9, the project would increase average delay at several study area intersections. The project would increase traffic volumes at several study area intersections. The resultant operating conditions do not exceed the LOS D goals.

Mitigation Measure 1:
None required.

Impact 2:
The proposed project could cause potentially significant impacts to transit. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect public transit operations. The project would not modify or impede any existing or planned transit facilities / routes.

Mitigation Measure 2:
None required.

Impact 3:
The proposed project could cause potentially significant impacts to pedestrian facilities. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect existing or planned pedestrian facilities. The project will include sidewalks along the project frontage.

Mitigation Measure 3:
None required.

Impact 4:
The proposed project could cause potentially significant impacts to bicycle facilities. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect existing or planned bicycle facilities.

Mitigation Measure 4:
None required.

Impact 5:
The proposed project could cause potentially significant impacts due to construction-related activities. Based on the analysis below, the impact is less than significant.

The City Code (City Code 12.20.030) requires that a construction traffic control plan be prepared and approved prior to the beginning of project construction, to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies. All work performed during construction must conform to the conditions and requirements of the approved plan. The plan shall ensure that safe and efficient movement of traffic through the construction work zone(s) is maintained. At a minimum, the plan shall include the following:

- Time and day of street closures
- Proper advance warning and posted signage regarding street closures

- Provision of driveway access plan to ensure safe vehicular, pedestrian, and bicycle movements
- Safe and efficient access routes for emergency vehicles
- Provisions for pedestrian safety
- Use of manual traffic control when necessary
- Number of anticipated truck trips, and time of day of arrival and departure of trucks
- Provision of a truck circulation pattern and staging area with a limitation on the number of trucks that can be waiting and any limitations on the size and type of trucks appropriate for the surrounding transportation network
- The plan must be available at the site for inspection by the City representative during all work. With the implementation of the traffic control plan, local roadways and freeway facilities will continue to operate at acceptable operating conditions and the impact of the project would be less than significant.

Mitigation Measure 5:
None required.

ON-SITE OPERATIONS REVIEW AND QUEUING

The project site plan was reviewed for conformity with accepted traffic engineering principles and City Design Guidelines.

Figure 2 shows the project site plan. Access is proposed to West El Camino Avenue (right-in / right-out), Orchard Lane (full access), and Orchard Court at two locations (full access).

INTERSECTION AND DRIVEWAY SPACING

The review of driveway spacing is based upon traffic engineering principles to maintain efficient movement for motorized vehicles, pedestrians, and bicyclists, and minimize conflicts and crashes. Research has shown that proper spacing of intersections and driveways reduces crash frequency, as motorists have ample time between decision points to react to other vehicles that may affect their movement.

West El Camino Avenue is a four-lane arterial roadway. Based upon the City Design and Procedures Manual Section 15 – Street Design Standards, minimum intersection and / or driveway spacing is 250 feet for a four-lane arterial (Table 15-7.3). The distance is measured between the nearest curb returns. The curb return is defined as the beginning of the curb radius connecting to the intersecting street. Driveway spacing for a four-lane arterial is 250 feet, measured between the inside edges of the driveways.

Orchard Lane is a two-lane minor collector. The minimum intersection spacing is 120 feet, with minimum driveway separation considered on a case by case basis.

Orchard Court is a local commercial street. The minimum intersection spacing is 120 feet, with minimum driveway separation of 10 feet.

The AASHTO "Green Book" states that "Driveways should not be situated within the functional boundary of at-grade intersections. This boundary would include the longitudinal limits of auxiliary lanes." In this context, auxiliary lanes refer to exclusive turning lanes at the intersections including taper lengths. Thus, driveways should not be located within the area of turning lanes or anticipated queuing areas.

INTERSECTION 9 – WEST EL CAMINO AVENUE AND DRIVE 1

The baseline plus project peak hour analysis indicates that this intersection will operate at an acceptable level of service as a right-in / right-out driveway, with 32.1 seconds of average delay (LOS D) on the driveway approach during the AM peak hour, and 17.1 seconds during the PM peak hour.

A review of the site plan indicates that this driveway is located less than 250 feet from the Orchard Drive intersection, measured from the curb return and inside driveway edge. This does not conform with City Street Design Standards.

Westbound West El Camino Avenue has two westbound lanes at the project site. Along the westerly edge of the project frontage, each lane is dedicated to a specific destination; the right lane is for traffic to I-80 East, and the left lane is for traffic to I-80 West or continuing on West El Camino Avenue to El Centro Road. During the p.m. peak hour, the westbound 95th percentile queue at Intersection 2 is estimated to extend to Intersection 9. Thus, the proposed driveway is within the functional boundary of Intersection 2. Traffic exiting the site may have difficulty accessing the left lane due to the queuing, and have the potential to block the right lane.

Recommendation 1 – Limit Drive 1 to inbound access only. Relocate the Drive 1 intersection with West El Camino Avenue to the west to achieve 250-foot driveway spacing. Maintain 250-foot driveway spacing to the west to the Caltrans Limited Access Line approaching the I-80 Eastbound entrance ramp. Provide a deceleration lane as long as possible.

INTERSECTION 10 – DRIVE 2 AND ORCHARD LANE

A review of the site plan indicates that the driveway is located within the area of the Orchard Lane turning lanes. The driveway location overlaps with the southbound turning lanes. No provision has been made for a northbound left turn lane for turning movements into the driveway. Due to the proximity of the driveway to Orchard Court, it is not feasible to provide northbound left turn lanes for both Drive 2 and Orchard Court. The proposed driveway is within the functional boundaries of Intersections 3 and 7.

Recommendation 2 – Eliminate driveway access to Orchard Lane.

INTERSECTION 11 – ORCHARD COURT AND DRIVE 1

The baseline plus project peak hour analysis indicates that this intersection will operate at an acceptable level of service as proposed. The driveway is located over 160 feet from Orchard Lane and over 300 feet from the cul-de-sac driveway (Drive 3), more than the City intersection spacing criteria. There are no proposed driveways on the north side of Orchard Court east of the cul-de-sac. This driveway location is acceptable.

CUL-DE-SAC – ORCHARD COURT AND DRIVE 3

This driveway location is acceptable, opposite the driveway to The Core Natomas, and located over 300 feet west of Drive 1.

DRIVEWAY THROAT LENGTHS

The "throat length" of a driveway is defined as the distance from the outer edge of the traveled way of the intersecting roadway to the first point along the driveway at which there are conflicting vehicular traffic movements. Conflicting movements include turning vehicles and vehicles entering / exiting parking stalls. Adequate throat length is critical to ensure that queued exiting vehicles do not interfere with / block entering vehicles, resulting in entering queues extending onto city sidewalks and / or streets.

INTERSECTION 9 – WEST EL CAMINO AVENUE AND DRIVE 1

The following recommendation assumes inbound only access at Drive 1 from West El Camino Avenue.

Recommendation 3 – Provide a minimum throat length of 5 vehicles on Drive 1 entering the site.

INTERSECTION 11 – ORCHARD COURT AND DRIVE 1

The site plan indicates a proposed throat length of about 60 feet on the Drive 1 approach to Orchard Court. This is acceptable. A minimum length of 50 feet should be maintained.

CUL-DE-SAC – ORCHARD COURT AND DRIVE 3

The site plan indicates a proposed throat length of about 50 feet on the Drive 3 approach to the Orchard Court cul-de-sac. This is acceptable. A minimum length of 50 feet should be maintained.

DRIVE-THRU QUEUEING ANALYSIS

The Sacramento City Code specifies the minimum stacking distance for a drive-through facility at 180 feet.

MCDONALDS

A review of the site plan indicates that the McDonalds drive-thru lane provides approximately 180 feet of storage, meeting the City requirement.

DUTCH BROTHERS

PM peak period observations of drive-through queuing were conducted by Fehr & Peers on Wednesday, February 5, 2020 at the following locations:

- Dutch Brothers coffee store located at 1225 Baseline Road in Roseville, CA
- Dutch Brothers coffee store located at 8610 Elk Grove Boulevard in Elk Grove, CA

The maximum queue observed at both locations was 16 vehicles. These queued vehicles represented both motorists waiting to place their order at the kiosk, as well as motorists in queue waiting to pay and receive their order. This queue length has been utilized by the City in the previous review of the proposed Dutch Brothers location on Northgate Boulevard.

The site plan shows approximately 280 feet available. Assuming each vehicle occupies 20 feet, the maximum queue of 320 feet (16 vehicles) would result in an excess of 40 feet, approximately two vehicles that would need to wait within the drive aisles of the parking lot. This could temporarily hinder circulation and parking maneuvers within the site, but any queuing would be expected to be contained within the site and would not spillback to City streets or sidewalks.

CAR WASH

A review of the site plan indicates that the Car Wash drive-thru lanes provide over 300 feet of storage, meeting the City requirement.

VEHICULAR CIRCULATION PATTERNS

With the revision of Drive 1 to accommodate only inbound access from West El Camino Avenue, the project circulation pattern does not encourage cut-through traffic.

BICYCLE ACCESS

On-street bicycle lanes are located along West El Camino Avenue and Orchard Lane. Access to the site is provided via the proposed driveways. Two short term bicycle spaces and two bicycle lockers are proposed at each of the four buildings, yielding a total of 16 bicycle parking spaces.

PEDESTRIAN ACCESS

PROJECT SITE

In addition to the sidewalks proposed along the street frontage on three sides of the project, the project provides several pedestrian paths / sidewalks on-site. Based upon a review of the site plan, the following recommendation has been developed:

Recommendation 4 – Provide direct pedestrian access (sidewalk / pathway) between the sidewalk on the north side of West El Camino Avenue and each of the Dutch Brothers, McDonalds, and 7-Eleven buildings.

Without implementation of this recommendation, pedestrians from the south may access the site through landscaped areas or driveways / parking lots rather than following the proposed circuitous pedestrian routes.

ORCHARD DRIVE PEDESTRIAN CROSSINGS

Pedestrian crosswalks of Orchard Drive are provided at West El Camino Avenue (signalized) and Lone Silo Avenue (roundabout). DKS has investigated a marked crosswalk at Orchard Court.

The City of Sacramento utilizes its Pedestrian Crossing Guidelines to evaluate the installation of marked crosswalks at uncontrolled locations. Based upon Phase 1 screening, a marked crosswalk is not recommended at this location:

- The location is not 300 feet or greater from the nearest crossing. While the crossing at West El Camino Avenue is about 300 feet south, the crossing at Lone Silo Avenue is less than 300 feet north.
- The crossing does not serve a direct pedestrian route. The east side of Orchard Lane is bordered by a privacy wall, and access is not provided to the Cove at this location.
- Continuous sidewalks on the west side of Orchard Lane provide pedestrian access from both existing crosswalks.

ON-SITE TRUCK CIRCULATION PLAN

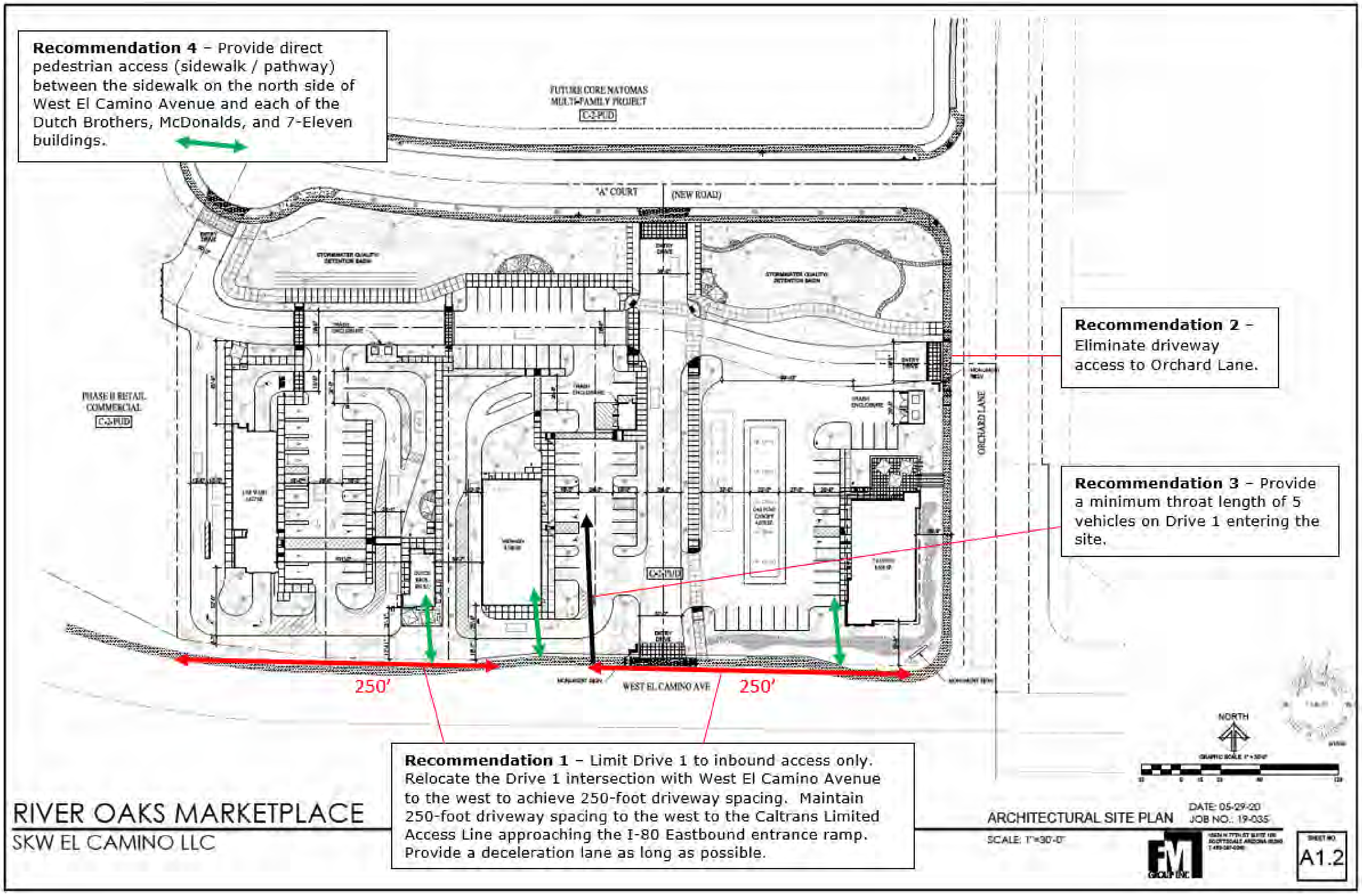
Anticipated truck turning movements should be illustrated on the site plan, as well as staging areas for deliveries. Large vehicles, including fuel tankers, trash trucks, and delivery trucks, should not unload / load in primary access drives during peak hours of operation.

ACCESS TO THE VACANT PARCEL TO THE WEST

The site plan illustrates a future connection to the parcel to the west at the intersection of Drive 2 and Drive 3. This connection will facilitate future travel between the parcels without the need to access the City street system. Provision of a future pedestrian connection at this location should also be accommodated.

SUMMARY OF RECOMMENDATIONS

Figure 14 summarizes the site circulation recommendations.



Recommendation 4 – Provide direct pedestrian access (sidewalk / pathway) between the sidewalk on the north side of West El Camino Avenue and each of the Dutch Brothers, McDonalds, and 7-Eleven buildings.

Recommendation 2 – Eliminate driveway access to Orchard Lane.

Recommendation 3 – Provide a minimum throat length of 5 vehicles on Drive 1 entering the site.

Recommendation 1 – Limit Drive 1 to inbound access only. Relocate the Drive 1 intersection with West El Camino Avenue to the west to achieve 250-foot driveway spacing. Maintain 250-foot driveway spacing to the west to the Caltrans Limited Access Line approaching the I-80 Eastbound entrance ramp. Provide a deceleration lane as long as possible.

FIGURE 14. SITE CIRCULATION RECOMMENDATIONS

BASELINE PLUS PROJECT WITH RECOMMENDATIONS TRAFFIC CONDITIONS

By modifying Intersection 9 and eliminating Intersection 10, the recommendations modify the travel patterns entering and exiting the site. DKS conducted analysis of intersection operating conditions with the recommendations.

BASELINE PLUS PROJECT WITH RECOMMENDATIONS TRIP DISTRIBUTION

Figure 15 illustrates the trip distribution at the project driveways assuming the implementation of the recommendations.

BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION GEOMETRY

Baseline plus project with recommendations intersection geometry is illustrated in Figure 16.

BASELINE PLUS PROJECT TRAFFIC VOLUMES

Figure 17 illustrates the baseline plus project with recommendations peak hour traffic volumes used in the analysis.

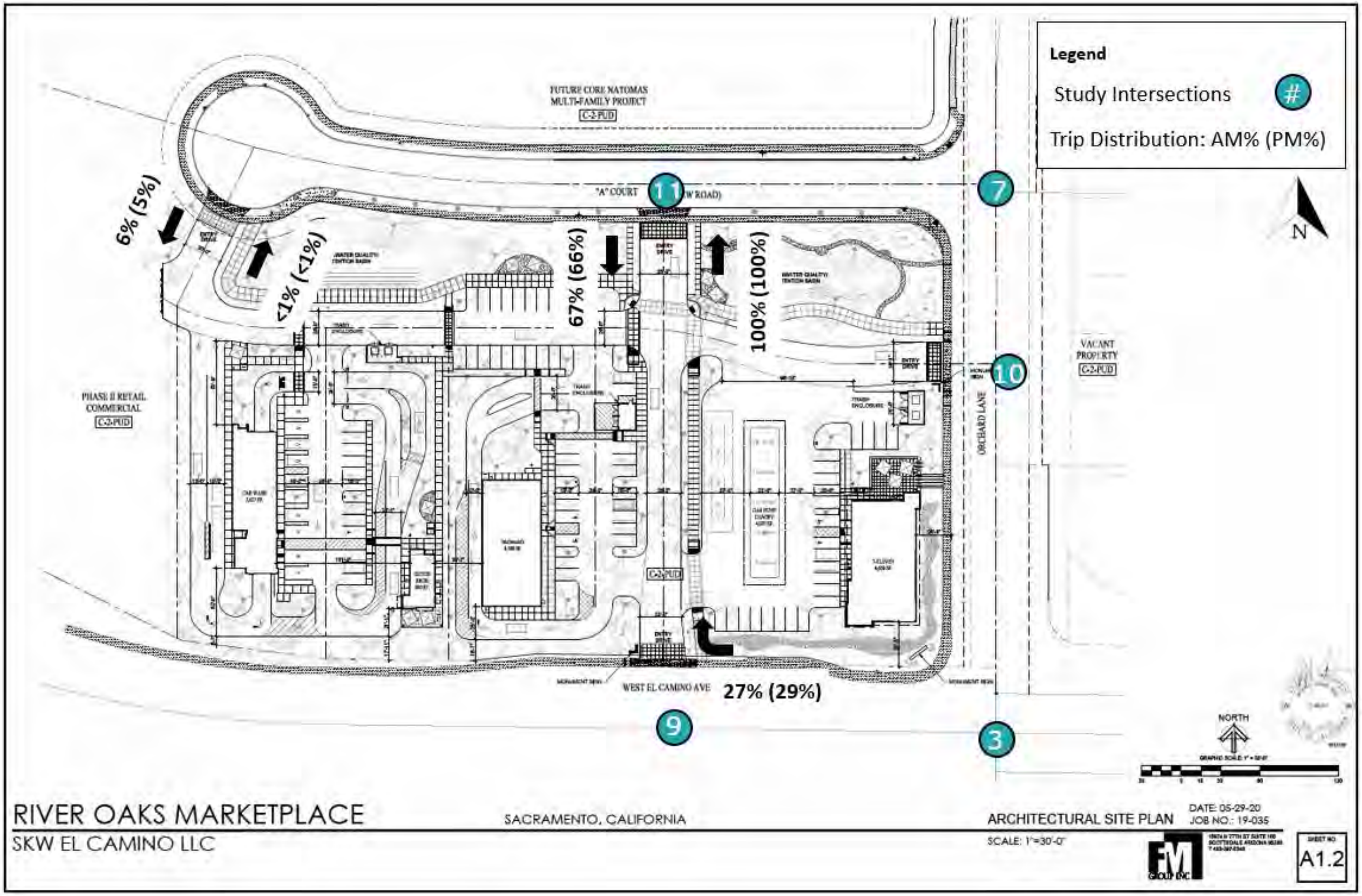


FIGURE 15. PROJECT DRIVEWAY TRIP DISTRIBUTION WITH RECOMMENDATIONS

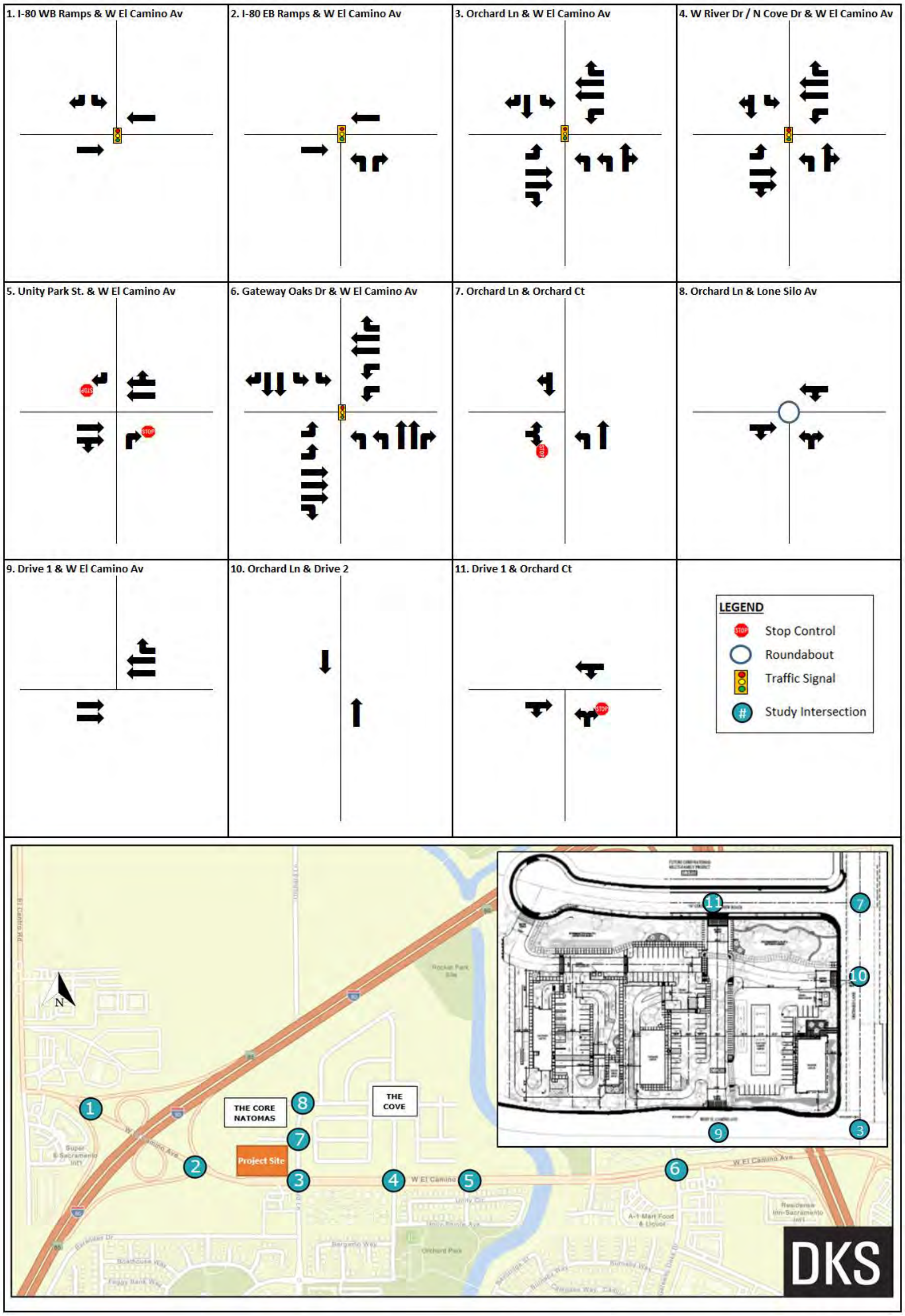


FIGURE 16. BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION LANE CONFIGURATION

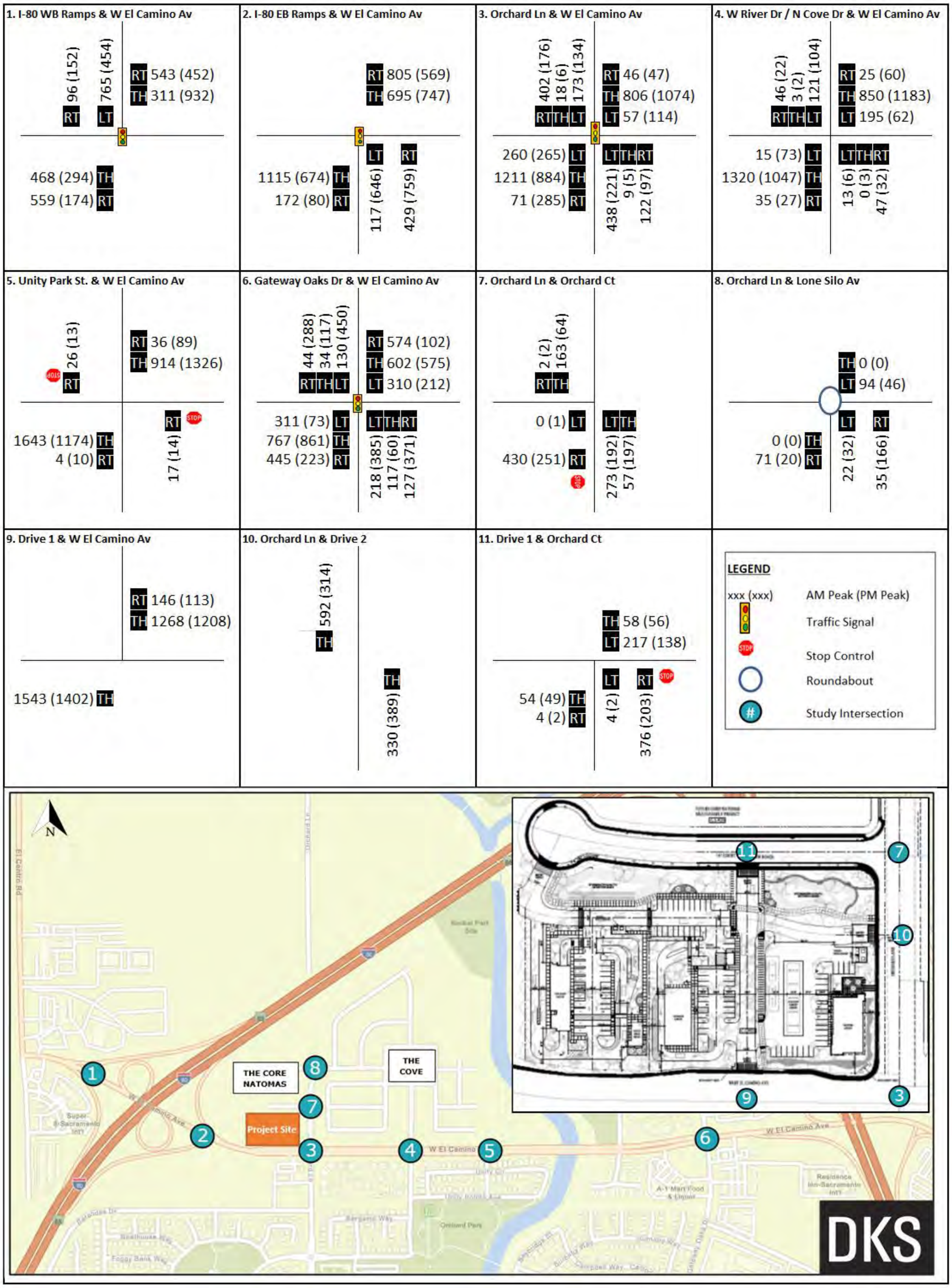


FIGURE 17. BASELINE PLUS PROJECT WITH RECOMMENDATIONS 2020 AM AND PM PEAK HOUR VOLUMES

RESULTS OF BASELINE PLUS PROJECT WITH RECOMMENDATIONS CONDITION ANALYSIS

Baseline plus project with recommendations condition intersection analysis results are summarized in Table 10. All the intersections operate at an acceptable LOS D or better.

TABLE 10. BASELINE PLUS PROJECT WITH RECOMMENDATIONS INTERSECTION OPERATION ANALYSIS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. W. El Camino Ave. & I-80 Westbound Ramps	23.3	C	18.7	B
2. W. El Camino Ave. & I-80 Eastbound Ramps	54.2	D	42.4	D
3. W. El Camino Ave. & Orchard Lane	51.9	D	41.3	D
4. W. El Camino Ave. & W. River Dr. / N. Cove Dr.	38.1	D	38.2	D
5. W. El Camino Ave. & Unity Park St. (avg)	0.2	A	0.1	A
- *Northbound*	17.0	C	13.3	B
- *Southbound*	12.1	B	14.9	B
6. W. El Camino Ave. & Gateway Oaks Dr.	37.0	D	34.4	C
7. Orchard Ct. & Orchard Ln. (avg)	8.4	A	3.8	A
- Northbound Left	8.2	A	7.7	A
- Eastbound	12.9	B	8.9	A
8. Lone Silo Ave. & Orchard Ln.	3.2	A	3.6	A
9. W. El Camino Ave. & Drive 1	No Control Delay			
10. Drive 2 & Orchard Ln.	Intersection Eliminated			
11. Orchard Ct. & Drive 1 (avg)	8.1	A	6.7	A
- *Northbound*	10.8	B	9.5	A
- *Westbound Left*	7.7	A	7.5	A

Source: DKS Associates, 2020.

VMT ANALYSIS

VMT IMPACT CRITERIA – SB 743

Senate Bill 743 (Steinberg, 2018), codified in Public Resources Code section 21099, required changes to the CEQA Guidelines on the analysis of transportation impacts. In January 2019, the Natural Resources Agency updated the CEQA Guidelines in response to SB 743. The revised guidelines state, "Generally, vehicle miles traveled is the most appropriate measure of transportation impacts." In addition, "Except as provided in subdivision (b)(2) below…a project's effect on automobile delay shall not constitute a significant environmental impact." With respect to the timing of the change to the CEQA Guidelines, "A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide."[1]

The most authoritative guidance on implementing the SB 743 changes comes from the Governor's Office of Planning and Research (OPR), which worked with the Natural Resources Agency to update the CEQA Guidelines. In December 2018, OPR published technical guidance recommending approaches to analyzing transportation and land use projects. Because new retail development often redistributes trips rather than creating new travel demand, the OPR guidance recommends that lead agencies analyze the net change in VMT to indicate the transportation impact of retail projects.[2]

The potential for VMT impacts, according to this approach, hinges on whether the project can be considered local-serving or regional. By adding retail opportunities within existing neighborhoods, local-serving retail projects can shorten trips and reduce overall VMT. In contrast, regional destination retail projects would draw customers from larger trade areas, potentially substituting for shorter trips and increasing VMT. The OPR guidance suggests that any retail projects including stores larger than 50,000 square feet might be considered regional serving retail.

RETAIL CENTER CHARACTERISTICS

The classification of commercial centers (retail centers, shopping centers) is complicated by the many possible combinations of uses within any center. However, for purposes of managing and leasing space, the shopping center industry has developed a classification scheme with ten categories. Of the ten categories, the "Strip / Convenience" Center and the "Neighborhood Center" can usually be considered as local-serving retail. These centers, which typically range in size up to 125,000 square feet, are occupied by uses oriented to a trade area of three miles or less. The typical uses are ubiquitous throughout the area, with many nearby competitors, as well as multiple locations of specific tenants. Neighborhood centers require the support of 6,000 to 8,000 households in a one- to two-mile radius.[3]

PROJECT ENVIRONS AND CHARACTERISTICS

As discussed in the description of VMT screening of retail projects, a retail project may result in a reduction of VMT if it is "local-serving retail". The following characteristics of the environs and of the project itself were evaluated.

---

[1] California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15064.3(c).

[2] Governor's Office of Planning and Research, Technical Advisory on Evaluating Transportation Impacts in CEQA. (New York: Free Press, December 2018), 15–16.

[3] A Primer on Retail Types and Urban Centers, Robert Steuteville, Congress for the New Urbanism, Public Square, September 1, 2007.

NEARBY LAND USES

The project is in the South Natomas Community Plan area, which encompasses about 5,000 acres. The South Natomas Community Plan Area encompasses numerous suburban neighborhoods, employment centers, and corridors. There are over 15,000 residents in South Natomas.

Immediately adjacent to the project to the north and east are the Core Natomas and The Cove residential projects, which will consist of 891 dwelling units at buildout. South of West El Camino Avenue is the established Willowcreek neighborhood, with over 1,500 dwelling units and 4,000 residents, within 1.2 miles of the project site.

PROJECT COMPONENTS

The proposed project components are retail / service uses that are common throughout the South Natomas area. They are intended to serve the local area and will compete with nearby businesses. No "unique" or destination-retail uses are proposed which would be likely to attract a substantial number of long-distance trips.

- Convenience Store – There are competing convenience stores within the site vicinity, including an AM PM market / fuel station across West El Camino Avenue.
- Restaurants / Coffee Shops – There are over twenty dining establishments within two miles of the site, including coffee shops and fast food restaurants.
- Car Wash – There are several car washes within the site vicinity, including a car wash associated with the AM PM market across West El Camino Avenue.

PROJECT TRAVEL PATTERNS

The earlier transportation analysis provides quantitative estimates of project vehicular trip generation. The project is estimated to generate 8,833 vehicle trips.

- About 36 percent of the trips will be internal trips. These internal trips between uses on the site will replace automobile trips.

- About 36 percent are expected to be pass-by trips. Pass-by trips are vehicle trips that access the project site that are already on the roadway network driving past the site. These linked trips result in minimal changes in VMT.

The project also has good pedestrian access to the adjacent existing and new neighborhoods, which could reduce automobile trips to the site.

SUMMARY

The project is considered to be local-serving retail, which is presumed to have a less than significant VMT impact based upon OPR guidance.

APPENDIX

2017 TRAFFIC COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: El Centro Rd & W El Camino Av
City: Sacramento
Control:

Project ID: 17-07949-001
Date: 11/16/2017

Total

NS/EW Streets:	El Centro Rd				El Centro Rd				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	5	0	180	8	0	0	0	0	0	0	7	0	48	7	255
7:15 AM	0	9	9	0	235	4	0	0	0	0	0	0	12	0	70	1	340
7:30 AM	0	5	7	0	261	7	0	0	0	0	0	0	16	0	74	3	373
7:45 AM	0	5	9	0	228	11	0	0	0	0	0	0	23	0	58	3	337
8:00 AM	0	4	9	0	253	6	0	0	0	0	0	0	19	0	50	3	344
8:15 AM	0	3	6	0	232	8	0	0	0	0	0	0	13	0	57	0	319
8:30 AM	0	4	10	0	229	12	0	0	0	0	0	0	16	0	58	1	330
8:45 AM	0	9	12	0	209	9	0	0	0	0	0	0	11	0	57	2	309
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	39	67	0	1827	65	0	0	0	0	0	0	117	0	472	20	2607
APPROACH %'s :	0.00%	36.79%	63.21%	0.00%	96.56%	3.44%	0.00%	0.00%					19.21%	0.00%	77.50%	3.28%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	23	34	0	977	28	0	0	0	0	0	0	70	0	252	10	1394
PEAK HR FACTOR :	0.000	0.639	0.944	0.000	0.936	0.636	0.000	0.000	0.000	0.000	0.000	0.000	0.761	0.000	0.851	0.833	0.934
	0.792				0.938								0.892				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	8	11	0	85	3	0	0	0	0	0	0	15	0	146	2	270
4:15 PM	0	7	6	0	92	6	0	0	0	0	0	0	17	0	143	5	276
4:30 PM	0	16	13	0	78	10	0	0	0	0	0	0	12	0	188	3	320
4:45 PM	0	10	10	0	83	7	0	0	0	0	0	0	15	0	193	1	319
5:00 PM	0	5	14	0	82	15	0	0	0	0	0	0	20	0	204	7	347
5:15 PM	0	15	16	0	86	9	0	0	0	0	0	0	18	0	189	3	336
5:30 PM	0	7	6	0	111	11	0	0	0	0	0	0	23	0	208	2	368
5:45 PM	0	9	9	0	151	9	0	0	0	0	0	0	14	0	194	6	392
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	77	85	0	768	70	0	0	0	0	0	0	134	0	1465	29	2628
APPROACH %'s :	0.00%	47.53%	52.47%	0.00%	91.65%	8.35%	0.00%	0.00%					8.23%	0.00%	89.99%	1.78%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	36	45	0	430	44	0	0	0	0	0	0	75	0	795	18	1443
PEAK HR FACTOR :	0.000	0.600	0.703	0.000	0.712	0.733	0.000	0.000	0.000	0.000	0.000	0.000	0.815	0.000	0.956	0.643	0.920
	0.653				0.741								0.953				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB Off Ramp & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-002
Date: 11/16/2017

Total

NS/EW Streets:	I-80 WB Off Ramp				I-80 WB Off Ramp				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	82	0	19	0	0	83	113	0	0	45	74	0	416
7:15 AM	0	0	0	0	138	0	28	0	0	121	131	0	0	58	132	0	608
7:30 AM	0	0	0	0	176	0	22	0	0	134	143	0	0	75	118	0	668
7:45 AM	0	0	0	0	163	0	18	0	0	112	123	0	0	69	120	0	605
8:00 AM	0	0	0	0	153	0	13	0	0	133	139	0	0	60	89	0	587
8:15 AM	0	0	0	0	170	0	21	0	0	118	123	0	0	53	89	0	574
8:30 AM	0	0	0	0	162	0	29	0	0	111	136	0	0	47	88	0	573
8:45 AM	0	0	0	0	147	0	26	0	0	111	117	0	0	45	49	0	495
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1191	0	176	0	0	923	1025	0	0	452	759	0	4526
APPROACH %'s :					87.13%	0.00%	12.87%	0.00%	0.00%	47.38%	52.62%	0.00%	0.00%	37.32%	62.68%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	630	0	81	0	0	500	536	0	0	262	459	0	2468
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.895	0.000	0.723	0.000	0.000	0.933	0.937	0.000	0.000	0.873	0.869	0.000	0.924
					0.898				0.935				0.934				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	71	0	37	0	0	59	45	0	0	126	88	0	426
4:15 PM	0	0	0	0	74	0	29	0	0	55	51	0	0	131	90	0	430
4:30 PM	0	0	0	0	84	0	32	0	0	50	41	0	0	174	119	0	500
4:45 PM	0	0	0	0	121	0	28	0	0	55	37	0	0	186	121	0	548
5:00 PM	0	0	0	0	112	0	34	0	0	63	39	0	0	201	127	0	576
5:15 PM	0	0	0	0	121	0	24	0	0	57	45	0	0	186	89	0	522
5:30 PM	0	0	0	0	104	0	33	0	0	72	48	0	0	203	83	0	543
5:45 PM	0	0	0	0	88	0	26	0	0	96	78	0	0	191	83	0	562
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	775	0	243	0	0	507	384	0	0	1398	800	0	4107
APPROACH %'s :					76.13%	0.00%	23.87%	0.00%	0.00%	56.90%	43.10%	0.00%	0.00%	63.60%	36.40%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	425	0	117	0	0	288	210	0	0	781	382	0	2203
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.878	0.000	0.860	0.000	0.000	0.750	0.673	0.000	0.000	0.962	0.752	0.000	0.956
					0.928				0.716				0.886				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB Off Ramp & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-003
Date: 11/16/2017

Total

NS/EW Streets:	I-80 EB Off Ramp				I-80 EB Off Ramp				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	22	0	48	0	0	0	0	0	0	131	29	0	0	109	92	0	431
7:15 AM	20	0	28	0	0	0	0	0	0	229	29	0	0	157	116	0	579
7:30 AM	25	0	37	0	0	0	0	0	0	270	38	0	0	183	149	0	702
7:45 AM	20	0	80	0	0	0	0	0	0	250	25	0	0	161	190	0	726
8:00 AM	23	0	73	0	0	0	0	0	0	254	34	0	0	128	100	0	612
8:15 AM	34	0	81	0	0	0	0	0	0	259	27	0	0	121	63	0	585
8:30 AM	36	0	63	0	0	0	0	0	0	238	37	0	0	103	47	0	524
8:45 AM	18	0	58	0	0	0	0	0	0	228	30	0	0	78	57	0	469
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	198	0	468	0	0	0	0	0	0	1859	249	0	0	1040	814	0	4628
APPROACH %'s :	29.73%	0.00%	70.27%	0.00%					0.00%	88.19%	11.81%	0.00%	0.00%	56.09%	43.91%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	102	0	271	0	0	0	0	0	0	1033	124	0	0	593	502	0	2625
PEAK HR FACTOR :	0.750	0.000	0.836	0.000	0.000	0.000	0.000	0.000	0.000	0.956	0.816	0.000	0.000	0.810	0.661	0.000	0.904
	0.811								0.939				0.780				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	67	0	104	0	0	0	0	0	0	109	23	0	0	155	141	0	599
4:15 PM	86	0	123	0	0	0	0	0	0	111	18	0	0	135	143	0	616
4:30 PM	103	0	158	0	0	0	0	0	0	110	19	0	0	194	172	0	756
4:45 PM	117	0	132	0	0	0	0	0	0	159	14	0	0	187	101	0	710
5:00 PM	149	0	166	0	0	0	0	0	0	156	18	0	0	185	163	0	837
5:15 PM	134	0	134	0	0	0	0	0	0	172	7	0	0	153	106	0	706
5:30 PM	145	0	158	0	0	0	0	0	0	168	11	0	0	144	97	0	723
5:45 PM	141	0	175	0	0	0	0	0	0	155	22	0	0	125	75	0	693
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	942	0	1150	0	0	0	0	0	0	1140	132	0	0	1278	998	0	5640
APPROACH %'s :	45.03%	0.00%	54.97%	0.00%					0.00%	89.62%	10.38%	0.00%	0.00%	56.15%	43.85%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	503	0	590	0	0	0	0	0	0	597	58	0	0	719	542	0	3009
PEAK HR FACTOR :	0.844	0.000	0.889	0.000	0.000	0.000	0.000	0.000	0.000	0.868	0.763	0.000	0.000	0.927	0.788	0.000	0.899
	0.867								0.915				0.861				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Orchard Ln & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-004
Date: 11/16/2017

Total

NS/EW Streets:	Orchard Ln				Orchard Ln				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	94	0	23	0	0	0	0	0	0	159	18	0	17	122	0	0	433
7:15 AM	92	0	24	0	0	0	0	0	0	231	17	0	15	151	0	0	530
7:30 AM	101	0	38	0	0	0	0	0	0	275	19	0	16	178	0	0	627
7:45 AM	113	0	33	0	0	0	0	0	0	302	18	0	17	168	0	0	651
8:00 AM	94	0	23	0	0	0	1	0	1	307	16	0	9	142	0	0	593
8:15 AM	89	0	26	0	0	0	0	0	0	324	13	0	13	126	0	0	591
8:30 AM	83	0	32	0	0	0	1	0	2	277	16	0	15	103	1	0	530
8:45 AM	66	0	32	0	0	0	2	0	0	258	20	0	11	77	1	0	467
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	732	0	231	0	0	0	4	0	3	2133	137	0	113	1067	2	0	4422
APPROACH %'s :	76.01%	0.00%	23.99%	0.00%	0.00%	0.00%	100.00%	0.00%	0.13%	93.84%	6.03%	0.00%	9.56%	90.27%	0.17%	0.00%	
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	397	0	120	0	0	0	1	0	1	1208	66	0	55	614	0	0	2462
PEAK HR FACTOR :	0.878	0.000	0.789	0.000	0.000	0.000	0.250	0.000	0.250	0.932	0.868	0.000	0.809	0.862	0.000	0.000	0.945
	0.885				0.250				0.946				0.862				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	42	0	25	0	0	0	0	0	0	162	49	0	25	239	0	0	542
4:15 PM	38	0	16	0	0	0	0	0	0	165	63	0	32	216	0	0	530
4:30 PM	60	0	30	0	1	0	1	0	1	190	78	0	32	276	1	0	670
4:45 PM	46	0	28	0	0	0	0	0	0	216	71	0	24	231	0	0	616
5:00 PM	65	0	21	0	1	0	0	0	1	236	71	0	25	273	0	0	693
5:15 PM	55	0	19	0	0	0	0	0	0	232	63	0	32	229	0	0	630
5:30 PM	60	0	34	0	0	0	0	0	0	242	75	0	30	189	0	0	630
5:45 PM	49	0	28	0	0	0	0	0	0	253	69	0	38	182	0	0	619
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	415	0	201	0	2	0	1	0	2	1696	539	0	238	1835	1	0	4930
APPROACH %'s :	67.37%	0.00%	32.63%	0.00%	66.67%	0.00%	33.33%	0.00%	0.09%	75.82%	24.09%	0.00%	11.48%	88.48%	0.05%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	226	0	98	0	2	0	1	0	2	874	283	0	113	1009	1	0	2609
PEAK HR FACTOR :	0.869	0.000	0.817	0.000	0.500	0.000	0.250	0.000	0.500	0.926	0.907	0.000	0.883	0.914	0.250	0.000	0.941
	0.900				0.375				0.941				0.909				

National Data & Surveying Services

Intersection Turning Movement Count

Location: W River Dr & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-005
Date: 11/16/2017

Total

NS/EW Streets:	W River Dr				W River Dr				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	11	0	0	0	0	0	0	164	1	0	16	148	0	0	340
7:15 AM	0	0	15	0	0	0	0	0	0	228	4	0	36	191	0	1	475
7:30 AM	0	0	13	0	0	0	0	0	0	252	16	0	79	211	0	0	571
7:45 AM	0	0	11	0	0	0	0	0	0	363	3	0	62	146	0	0	585
8:00 AM	0	0	8	0	0	0	0	0	0	334	8	0	16	123	0	1	490
8:15 AM	0	0	11	0	0	0	0	0	0	333	1	0	1	114	0	1	461
8:30 AM	0	0	8	0	0	0	0	0	0	322	1	0	2	107	0	1	441
8:45 AM	0	0	17	0	0	0	0	0	0	301	6	0	3	96	0	0	423
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	94	0	0	0	0	0	0	2297	40	0	215	1136	0	4	3786
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	98.29%	1.71%	0.00%	15.87%	83.84%	0.00%	0.30%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	47	0	0	0	0	0	0	1177	31	0	193	671	0	2	2121
PEAK HR FACTOR :	0.000	0.000	0.783	0.000	0.000	0.000	0.000	0.000	0.000	0.811	0.484	0.000	0.611	0.795	0.000	0.500	0.906
	0.783								0.825				0.747				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	6	0	0	0	0	0	0	162	13	0	20	276	0	1	478
4:15 PM	0	0	6	0	0	0	0	0	0	190	6	0	25	259	0	2	488
4:30 PM	0	0	7	0	0	0	0	0	0	213	5	0	21	335	0	1	582
4:45 PM	0	0	5	0	0	0	0	0	0	228	7	0	10	242	0	0	492
5:00 PM	0	0	7	0	0	0	0	0	0	269	9	0	16	310	0	2	613
5:15 PM	0	0	13	0	0	0	0	0	0	264	6	0	12	208	0	0	503
5:30 PM	0	0	6	0	0	0	0	0	0	252	8	0	24	236	0	0	526
5:45 PM	0	0	13	0	0	0	0	0	0	283	9	0	9	175	0	2	491
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	63	0	0	0	0	0	0	1861	63	0	137	2041	0	8	4173
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	96.73%	3.27%	0.00%	6.27%	93.37%	0.00%	0.37%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	32	0	0	0	0	0	0	974	27	0	59	1095	0	3	2190
PEAK HR FACTOR :	0.000	0.000	0.615	0.000	0.000	0.000	0.000	0.000	0.000	0.905	0.750	0.000	0.702	0.817	0.000	0.375	0.893
	0.615								0.900				0.810				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Unity Park St & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-006
Date: 11/16/2017

Total

NS/EW Streets:	Unity Park St				Unity Park St				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	7	0	0	0	0	0	0	176	1	0	0	133	0	0	317
7:15 AM	0	0	6	0	0	0	0	0	0	228	1	0	0	211	0	0	446
7:30 AM	0	0	5	0	0	0	0	0	0	286	0	0	0	275	0	0	566
7:45 AM	0	0	9	0	0	0	0	0	0	394	2	0	0	223	0	0	628
8:00 AM	0	0	2	0	0	0	0	0	0	359	2	0	0	150	0	0	513
8:15 AM	0	0	1	0	0	0	0	0	0	340	0	0	0	126	0	0	467
8:30 AM	0	0	2	0	0	0	0	0	0	339	0	0	0	113	0	0	454
8:45 AM	0	0	2	0	0	0	0	0	0	303	1	0	0	89	0	0	395
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	34	0	0	0	0	0	0	2425	7	0	0	1320	0	0	3786
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.71%	0.29%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	0	0	17	0	0	0	0	0	0	1379	4	0	0	774	0	0	2174
PEAK HR FACTOR :	0.000	0.000	0.472	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.500	0.000	0.000	0.704	0.000	0.000	0.865
	0.472								0.873				0.704				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	4	0	0	0	0	0	0	165	0	0	0	276	0	0	445
4:15 PM	0	0	1	0	0	0	0	0	0	214	2	0	0	260	0	0	477
4:30 PM	0	0	3	0	0	0	0	0	0	208	0	0	0	356	0	0	567
4:45 PM	0	0	3	0	0	0	0	0	0	232	3	0	0	254	0	0	492
5:00 PM	0	0	4	0	0	0	0	0	0	273	3	0	0	343	0	0	623
5:15 PM	0	0	4	0	0	0	0	0	0	289	4	0	0	243	0	0	540
5:30 PM	0	0	2	0	0	0	0	0	0	273	1	0	0	248	0	0	524
5:45 PM	0	0	1	0	0	0	0	0	0	281	1	0	0	178	0	0	461
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	22	0	0	0	0	0	0	1935	14	0	0	2158	0	0	4129
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.28%	0.72%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	0	14	0	0	0	0	0	0	1002	10	0	0	1196	0	0	2222
PEAK HR FACTOR :	0.000	0.000	0.875	0.000	0.000	0.000	0.000	0.000	0.000	0.867	0.625	0.000	0.000	0.840	0.000	0.000	0.892
	0.875								0.863				0.840				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Gateway Oaks Dr & W El Camino Ave
City: Sacramento
Control:

Project ID: 17-07949-007
Date: 11/16/2017

Total

NS/EW Streets:	Gateway Oaks Dr				Gateway Oaks Dr				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	42	6	22	1	30	3	9	0	24	92	51	2	26	84	53	12	457
7:15 AM	49	8	32	1	28	2	10	0	29	95	69	2	36	133	76	13	583
7:30 AM	67	26	32	2	31	7	8	0	45	136	92	5	47	191	95	21	805
7:45 AM	34	26	38	1	40	8	4	0	69	183	101	8	63	143	155	16	889
8:00 AM	43	27	31	0	35	9	9	0	72	141	109	4	71	80	168	14	813
8:15 AM	39	38	26	0	24	10	8	0	70	119	98	6	60	57	156	18	729
8:30 AM	17	17	22	0	42	8	10	0	64	128	120	2	45	76	121	14	686
8:45 AM	33	24	21	1	32	9	7	0	69	86	94	1	58	47	101	17	600
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	324	172	224	6	262	56	65	0	442	980	734	30	406	811	925	125	5562
APPROACH %'s :	44.63%	23.69%	30.85%	0.83%	68.41%	14.62%	16.97%	0.00%	20.22%	44.83%	33.58%	1.37%	17.91%	35.77%	40.80%	5.51%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	183	117	127	3	130	34	29	0	256	579	400	23	241	471	574	69	3236
PEAK HR FACTOR :	0.683	0.770	0.836	0.375	0.813	0.850	0.806	0.000	0.889	0.791	0.917	0.719	0.849	0.616	0.854	0.821	0.910
		0.846				0.910				0.871				0.899			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	73	7	72	1	124	33	65	0	15	116	31	6	32	99	24	17	715
4:15 PM	71	8	56	3	100	11	68	1	6	135	35	2	51	102	26	12	687
4:30 PM	104	13	103	0	108	37	92	0	10	161	33	5	41	103	17	24	851
4:45 PM	69	12	73	0	123	22	52	0	11	175	51	6	45	97	29	12	777
5:00 PM	114	16	109	2	131	33	75	0	12	201	54	4	32	111	30	12	936
5:15 PM	74	19	86	1	88	25	41	0	15	182	62	3	39	93	26	7	761
5:30 PM	75	13	50	1	86	11	51	0	9	181	65	4	33	106	26	25	736
5:45 PM	64	8	38	2	38	9	23	0	14	176	67	8	47	95	33	16	638
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	644	96	587	10	798	181	467	1	92	1327	398	38	320	806	211	125	6101
APPROACH %'s :	48.17%	7.18%	43.90%	0.75%	55.15%	12.51%	32.27%	0.07%	4.96%	71.54%	21.46%	2.05%	21.89%	55.13%	14.43%	8.55%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	361	60	371	3	450	117	260	0	48	719	200	18	157	404	102	55	3325
PEAK HR FACTOR :	0.792	0.789	0.851	0.375	0.859	0.791	0.707	0.000	0.800	0.894	0.806	0.750	0.872	0.910	0.850	0.573	0.888
		0.825				0.865				0.909				0.970			

2020 TRAFFIC COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-001
Date: 2/6/2020

Total

NS/EW Streets:	I-80 WB On/Off-Ramps				I-80 WB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	161	0	28	0	0	85	157	0	0	63	111	0	605
7:15 AM	0	0	0	0	191	0	19	0	0	99	150	0	0	57	98	0	614
7:30 AM	0	0	0	0	177	0	24	0	0	144	118	0	0	73	99	0	635
7:45 AM	0	0	0	0	181	0	25	0	0	121	134	0	0	81	120	0	662
8:00 AM	0	0	0	0	156	0	25	0	0	142	127	0	0	47	85	0	582
8:15 AM	0	0	0	0	214	0	25	0	0	110	111	0	0	61	72	0	593
8:30 AM	0	0	0	0	182	0	28	0	0	74	139	0	0	47	73	0	543
8:45 AM	0	0	0	0	121	0	39	0	0	90	78	0	0	50	76	0	454
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1383	0	213	0	0	865	1014	0	0	479	734	0	4688
APPROACH %'s :					86.65%	0.00%	13.35%	0.00%	0.00%	46.04%	53.96%	0.00%	0.00%	39.49%	60.51%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	710	0	96	0	0	449	559	0	0	274	428	0	2516
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.929	0.000	0.857	0.000	0.000	0.780	0.890	0.000	0.000	0.846	0.892	0.000	0.950
						0.960				0.962				0.873			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	72	0	30	0	0	55	43	0	0	173	96	0	469
4:15 PM	0	0	0	0	69	0	33	0	0	43	50	0	0	221	87	0	503
4:30 PM	0	0	0	0	87	0	43	0	0	64	42	0	0	221	125	0	582
4:45 PM	0	0	0	0	76	0	36	0	0	53	52	0	0	234	83	0	534
5:00 PM	0	0	0	0	72	0	31	0	0	51	45	0	0	219	97	0	515
5:15 PM	0	0	0	0	86	0	42	0	0	64	35	0	0	231	103	0	561
5:30 PM	0	0	0	0	96	0	31	0	0	64	39	0	0	221	88	0	539
5:45 PM	0	0	0	0	75	0	39	0	0	55	35	0	0	194	57	0	455
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	633	0	285	0	0	449	341	0	0	1714	736	0	4158
APPROACH %'s :					68.95%	0.00%	31.05%	0.00%	0.00%	56.84%	43.16%	0.00%	0.00%	69.96%	30.04%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	321	0	152	0	0	232	174	0	0	905	408	0	2192
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.922	0.000	0.884	0.000	0.000	0.906	0.837	0.000	0.000	0.967	0.816	0.000	0.942
						0.910				0.958				0.949			

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-001
Date: 2/6/2020

Cars

NS/EW Streets:	I-80 WB On/Off-Ramps				I-80 WB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	161	0	25	0	0	78	151	0	0	60	110	0	585
7:15 AM	0	0	0	0	189	0	18	0	0	93	146	0	0	54	97	0	597
7:30 AM	0	0	0	0	177	0	24	0	0	135	116	0	0	64	97	0	613
7:45 AM	0	0	0	0	179	0	17	0	0	115	128	0	0	74	120	0	633
8:00 AM	0	0	0	0	153	0	19	0	0	132	118	0	0	43	84	0	549
8:15 AM	0	0	0	0	213	0	13	0	0	101	104	0	0	60	71	0	562
8:30 AM	0	0	0	0	179	0	22	0	0	69	129	0	0	45	73	0	517
8:45 AM	0	0	0	0	119	0	23	0	0	85	74	0	0	47	75	0	423
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1370	0	161	0	0	808	966	0	0	447	727	0	4479
APPROACH %'s :					89.48%	0.00%	10.52%	0.00%	0.00%	45.55%	54.45%	0.00%	0.00%	38.07%	61.93%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	706	0	84	0	0	421	541	0	0	252	424	0	2428
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.934	0.000	0.840	0.000	0.000	0.780	0.896	0.000	0.000	0.851	0.883	0.000	0.959
						0.954				0.958				0.871			

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	71	0	19	0	0	52	40	0	0	170	93	0	445
4:15 PM	0	0	0	0	69	0	28	0	0	40	45	0	0	214	86	0	482
4:30 PM	0	0	0	0	86	0	30	0	0	58	38	0	0	213	125	0	550
4:45 PM	0	0	0	0	75	0	27	0	0	46	51	0	0	224	83	0	506
5:00 PM	0	0	0	0	72	0	26	0	0	40	39	0	0	213	97	0	487
5:15 PM	0	0	0	0	86	0	32	0	0	55	35	0	0	229	102	0	539
5:30 PM	0	0	0	0	95	0	27	0	0	58	35	0	0	219	88	0	522
5:45 PM	0	0	0	0	74	0	30	0	0	49	34	0	0	187	56	0	430
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	628	0	219	0	0	398	317	0	0	1669	730	0	3961
APPROACH %'s :					74.14%	0.00%	25.86%	0.00%	0.00%	55.66%	44.34%	0.00%	0.00%	69.57%	30.43%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	319	0	115	0	0	199	163	0	0	879	407	0	2082
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.927	0.000	0.898	0.000	0.000	0.858	0.799	0.000	0.000	0.960	0.814	0.000	0.946
						0.919				0.933				0.951			

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-001
Date: 2/6/2020

HT

NS/EW Streets:	I-80 WB On/Off-Ramps				I-80 WB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	3	0	0	7	6	0	0	3	1	0	20
7:15 AM	0	0	0	0	2	0	1	0	0	6	4	0	0	3	1	0	17
7:30 AM	0	0	0	0	0	0	0	0	0	9	2	0	0	9	2	0	22
7:45 AM	0	0	0	0	2	0	8	0	0	6	6	0	0	7	0	0	29
8:00 AM	0	0	0	0	3	0	6	0	0	10	9	0	0	4	1	0	33
8:15 AM	0	0	0	0	1	0	12	0	0	9	7	0	0	1	1	0	31
8:30 AM	0	0	0	0	3	0	6	0	0	5	10	0	0	2	0	0	26
8:45 AM	0	0	0	0	2	0	16	0	0	5	4	0	0	3	1	0	31
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	13	0	52	0	0	57	48	0	0	32	7	0	209
APPROACH %'s :					20.00%	0.00%	80.00%	0.00%	0.00%	54.29%	45.71%	0.00%	0.00%	82.05%	17.95%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	4	0	12	0	0	28	18	0	0	22	4	0	88
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.500	0.000	0.375	0.000	0.000	0.778	0.750	0.000	0.000	0.611	0.500	0.000	0.759
						0.400				0.885				0.591			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	1	0	11	0	0	3	3	0	0	3	3	0	24
4:15 PM	0	0	0	0	0	0	5	0	0	3	5	0	0	7	1	0	21
4:30 PM	0	0	0	0	1	0	13	0	0	6	4	0	0	8	0	0	32
4:45 PM	0	0	0	0	1	0	9	0	0	7	1	0	0	10	0	0	28
5:00 PM	0	0	0	0	0	0	5	0	0	11	6	0	0	6	0	0	28
5:15 PM	0	0	0	0	0	0	10	0	0	9	0	0	0	2	1	0	22
5:30 PM	0	0	0	0	1	0	4	0	0	6	4	0	0	2	0	0	17
5:45 PM	0	0	0	0	1	0	9	0	0	6	1	0	0	7	1	0	25
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	5	0	66	0	0	51	24	0	0	45	6	0	197
APPROACH %'s :					7.04%	0.00%	92.96%	0.00%	0.00%	68.00%	32.00%	0.00%	0.00%	88.24%	11.76%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	2	0	37	0	0	33	11	0	0	26	1	0	110
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.500	0.000	0.712	0.000	0.000	0.750	0.458	0.000	0.000	0.650	0.250	0.000	0.859
						0.696				0.647				0.675			

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-001
Date: 2/6/2020

Bikes

NS/EW Streets:	I-80 WB On/Off-Ramps				I-80 WB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.250
									0.250				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 WB On/Off-Ramps & W El Camino Ave
City: Sacramento

Project ID: 20-07035-001
Date: 2/6/2020

Pedestrians (Crosswalks)

NS/EW Streets:	I-80 WB On/Off-Ramps		I-80 WB On/Off-Ramps		W El Camino Ave		W El Camino Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	1	0	0	0	0	0	0	1
7:15 AM	0	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	2	0	0	0	0	0	0	3
APPROACH %'s :	33.33%	66.67%							
PEAK HR :	07:00 AM - 08:00 AM								TOTAL
PEAK HR VOL :	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :		0.500							0.500
	0.500								

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	1	1	0	0	0	0	0	1	3
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	2	0	0	0	0	0	1	4
APPROACH %'s :	33.33%	66.67%					0.00%	100.00%	
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	1	1	0	0	0	0	0	1	3
PEAK HR FACTOR :	0.250	0.250						0.250	0.250
	0.250						0.250		

Prepared by National Data & Surveying Services

I-80 WB On/Off-Ramps & W El Camino Ave

Peak Hour Turning Movement Count

ID: 20-07035-001
City: Sacramento

Day: Thursday
Date: 02/06/2020

PEAK HOURS		COUNT PERIODS
07:00 AM - 08:00 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM

I-80 WB On/Off-Ramps
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	96	0	710	0	428
NOON	0	0	0	0	0
PM	152	0	321	0	408
	1	0	1	0	

W El Camino Ave
EASTBOUND

	AM	NOON	PM	
⇦	370	0	1057	
↶	0	0	0	0
↱	0	0	0	0
→	449	0	232	1
↴	559	0	174	1

WESTBOUND
W El Camino Ave

		PM	NOON	AM
1	↰	408	0	428
1	←	905	0	274
0	↲	0	0	0
0	↶	0	0	0
	⇨	553	0	1159

NORTHBOUND
I-80 WB On/Off-Ramps

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	174	0	0	0	0
NOON	0	0	0	0	0
AM	559	0	0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	2516	0	2192
PHF	0.95		0.94

Cars (AM)

SB	84	0	706
EB	0	421	541
WB	424	252	0
NB	0	0	0

HT (AM)

SB	12	0	4
EB	0	28	18
WB	4	22	0
NB	0	0	0

Cars (NOON)

SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

HT (NOON)

SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

Cars (PM)

SB	115	0	319
EB	0	199	163
WB	407	879	0
NB	0	0	0

HT (PM)

SB	37	0	2
EB	0	33	11
WB	1	26	0
NB	0	0	0

Pedestrians (Crosswalks)

	PM	NOON	AM	AM	NOON	PM
North crosswalk	1	0	0	2	0	1
South crosswalk	0	0	0	0	0	0
NW corner	0	0	0			
NE corner				0	0	0
SW corner	0	0	0			
SE corner				0	0	0

	PM	NOON	AM	AM	NOON	PM
West crosswalk	1	0	0	0	0	0
East crosswalk	0	0	0	0	0	0

File Name: 20-07035-001
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 WB On/Off-Ramps Southbound				W El Camino Ave Westbound				I-80 WB On/Off-Ramps Northbound				W El Camino Ave Eastbound				
Start Time	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	605
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1219
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1854
7:00 AM	161	0	28	0	0	63	111	0	0	0	0	0	0	85	157	0	2516
7:15 AM	191	0	19	0	0	57	98	0	0	0	0	0	0	99	150	0	2493
7:30 AM	177	0	24	0	0	73	99	0	0	0	0	0	0	144	118	0	2472
7:45 AM	181	0	25	0	0	81	120	0	0	0	0	0	0	121	134	0	2380
8:00 AM	156	0	25	0	0	47	85	0	0	0	0	0	0	142	127	0	2172
8:15 AM	214	0	25	0	0	61	72	0	0	0	0	0	0	110	111	0	1590
8:30 AM	182	0	28	0	0	47	73	0	0	0	0	0	0	74	139	0	997
8:45 AM	121	0	39	0	0	50	76	0	0	0	0	0	0	90	78	0	454
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	469
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	972
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1554
4:00 PM	72	0	30	0	0	173	96	0	0	0	0	0	0	55	43	0	2088
4:15 PM	69	0	33	0	0	221	87	0	0	0	0	0	0	43	50	0	2134
4:30 PM	87	0	43	0	0	221	125	0	0	0	0	0	0	64	42	0	2192
4:45 PM	76	0	36	0	0	234	83	0	0	0	0	0	0	53	52	0	2149
5:00 PM	72	0	31	0	0	219	97	0	0	0	0	0	0	51	45	0	2070
5:15 PM	86	0	42	0	0	231	103	0	0	0	0	0	0	64	35	0	1555
5:30 PM	96	0	31	0	0	221	88	0	0	0	0	0	0	64	39	0	994
5:45 PM	75	0	39	0	0	194	57	0	0	0	0	0	0	55	35	0	455
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: 20-07035-001
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 WB On/Off-Ramps Southbound				W El Camino Ave Westbound				I-80 WB On/Off-Ramps Northbound				W El Camino Ave Eastbound				
Start Time	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
5:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: 20-07035-001
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 WB On/Off-Ramps Southbound				W El Camino Ave Westbound				I-80 WB On/Off-Ramps Northbound				W El Camino Ave Eastbound				
Start Time	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
7:00 AM	0	0	3	0	0	3	1	0	0	0	0	0	0	7	6	0	88
7:15 AM	2	0	1	0	0	3	1	0	0	0	0	0	0	6	4	0	101
7:30 AM	0	0	0	0	0	9	2	0	0	0	0	0	0	9	2	0	115
7:45 AM	2	0	8	0	0	7	0	0	0	0	0	0	0	6	6	0	119
8:00 AM	3	0	6	0	0	4	1	0	0	0	0	0	0	10	9	0	121
8:15 AM	1	0	12	0	0	1	1	0	0	0	0	0	0	9	7	0	88
8:30 AM	3	0	6	0	0	2	0	0	0	0	0	0	0	5	10	0	57
8:45 AM	2	0	16	0	0	3	1	0	0	0	0	0	0	5	4	0	31
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77
4:00 PM	1	0	11	0	0	3	3	0	0	0	0	0	0	3	3	0	105
4:15 PM	0	0	5	0	0	7	1	0	0	0	0	0	0	3	5	0	109
4:30 PM	1	0	13	0	0	8	0	0	0	0	0	0	0	6	4	0	110
4:45 PM	1	0	9	0	0	10	0	0	0	0	0	0	0	7	1	0	95
5:00 PM	0	0	5	0	0	6	0	0	0	0	0	0	0	11	6	0	92
5:15 PM	0	0	10	0	0	2	1	0	0	0	0	0	0	9	0	0	64
5:30 PM	1	0	4	0	0	2	0	0	0	0	0	0	0	6	4	0	42
5:45 PM	1	0	9	0	0	7	1	0	0	0	0	0	0	6	1	0	25
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700

orders@atdtraffic.com

File Name : 20-07035-001
Date : 02/06/2020

Unshifted Count = All Vehicles & Uturns

	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	161	0	28	0	189	0	63	111	0	174	0	0	0	0	0	0	85	157	0	242	605	0
7:15	191	0	19	0	210	0	57	98	0	155	0	0	0	0	0	0	99	150	0	249	614	0
7:30	177	0	24	0	201	0	73	99	0	172	0	0	0	0	0	0	144	118	0	262	635	0
7:45	181	0	25	0	206	0	81	120	0	201	0	0	0	0	0	0	121	134	0	255	662	0
Total	710	0	96	0	806	0	274	428	0	702	0	0	0	0	0	0	449	559	0	1008	2516	0
8:00	156	0	25	0	181	0	47	85	0	132	0	0	0	0	0	0	142	127	0	269	582	0
8:15	214	0	25	0	239	0	61	72	0	133	0	0	0	0	0	0	110	111	0	221	593	0
8:30	182	0	28	0	210	0	47	73	0	120	0	0	0	0	0	0	74	139	0	213	543	0
8:45	121	0	39	0	160	0	50	76	0	126	0	0	0	0	0	0	90	78	0	168	454	0
Total	673	0	117	0	790	0	205	306	0	511	0	0	0	0	0	0	416	455	0	871	2172	0
16:00	72	0	30	0	102	0	173	96	0	269	0	0	0	0	0	0	55	43	0	98	469	0
16:15	69	0	33	0	102	0	221	87	0	308	0	0	0	0	0	0	43	50	0	93	503	0
16:30	87	0	43	0	130	0	221	125	0	346	0	0	0	0	0	0	64	42	0	106	582	0
16:45	76	0	36	0	112	0	234	83	0	317	0	0	0	0	0	0	53	52	0	105	534	0
Total	304	0	142	0	446	0	849	391	0	1240	0	0	0	0	0	0	215	187	0	402	2088	0
17:00	72	0	31	0	103	0	219	97	0	316	0	0	0	0	0	0	51	45	0	96	515	0
17:15	86	0	42	0	128	0	231	103	0	334	0	0	0	0	0	0	64	35	0	99	561	0
17:30	96	0	31	0	127	0	221	88	0	309	0	0	0	0	0	0	64	39	0	103	539	0
17:45	75	0	39	0	114	0	194	57	0	251	0	0	0	0	0	0	55	35	0	90	455	0
Total	329	0	143	0	472	0	865	345	0	1210	0	0	0	0	0	0	234	154	0	388	2070	0
Grand Total	2016	0	498	0	2514	0	2193	1470	0	3663	0	0	0	0	0	0	1314	1355	0	2669	8846	0
Apprch %	80.2%	0.0%	19.8%	0.0%		0.0%	59.9%	40.1%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	49.2%	50.8%	0.0%			
Total %	22.8%	0.0%	5.6%	0.0%	28.4%	0.0%	24.8%	16.6%	0.0%	41.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.9%	15.3%	0.0%	30.2%	100.0%	

AM PEAK HOUR	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
7:00	161	0	28	0	189	0	63	111	0	174	0	0	0	0	0	0	85	157	0	242	605
7:15	191	0	19	0	210	0	57	98	0	155	0	0	0	0	0	0	99	150	0	249	614
7:30	177	0	24	0	201	0	73	99	0	172	0	0	0	0	0	0	144	118	0	262	635
7:45	181	0	25	0	206	0	81	120	0	201	0	0	0	0	0	0	121	134	0	255	662
Total Volume	710	0	96	0	806	0	274	428	0	702	0	0	0	0	0	0	449	559	0	1008	2516
% App Total	88.1%	0.0%	11.9%	0.0%		0.0%	39.0%	61.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	44.5%	55.5%	0.0%		
PHF	.929	.000	.857	.000	.960	.000	.846	.892	.000	.873	.000	.000	.000	.000	.000	.000	.780	.890	.000	.962	.950

PM PEAK HOUR	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	87	0	43	0	130	0	221	125	0	346	0	0	0	0	0	0	64	42	0	106	582
16:45	76	0	36	0	112	0	234	83	0	317	0	0	0	0	0	0	53	52	0	105	534
17:00	72	0	31	0	103	0	219	97	0	316	0	0	0	0	0	0	51	45	0	96	515
17:15	86	0	42	0	128	0	231	103	0	334	0	0	0	0	0	0	64	35	0	99	561
Total Volume	321	0	152	0	473	0	905	408	0	1313	0	0	0	0	0	0	232	174	0	406	2192
% App Total	67.9%	0.0%	32.1%	0.0%		0.0%	68.9%	31.1%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	57.1%	42.9%	0.0%		
PHF	.922	.000	.884	.000	.910	.000	.967	.816	.000	.949	.000	.000	.000	.000	.000	.000	.906	.837	.000	.958	.942

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700

orders@atdtraffic.com

File Name : 20-07035-001
Date : 02/06/2020

Bank 1 Count = Bikes & Peds

	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
7:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
17:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4
Grand Total	0	0	0	6	0	0	1	0	0	1	0	0	0	0	0	0	2	0	1	2	3	7
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	33.3%	0.0%		33.3%	0.0%	0.0%	0.0%		0.0%	0.0%	66.7%	0.0%		66.7%	100.0%	

AM PEAK HOUR	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
7:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.250

PM PEAK HOUR	I-80 WB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 WB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
17:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	1	0	1	1	2
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.000	.250	.000		.250	.250

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700

orders@atdtraffic.com

File Name : 20-07035-001
Date : 02/06/2020

Bank 2 Count = HT

	I-80 WB On/Off-Ramps					W El Camino Ave					I-80 WB On/Off-Ramps					W El Camino Ave						
	Southbound					Westbound					Northbound					Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	0	3	0	3	0	3	1	0	4	0	0	0	0	0	0	7	6	0	13	20	0
7:15	2	0	1	0	3	0	3	1	0	4	0	0	0	0	0	0	6	4	0	10	17	0
7:30	0	0	0	0	0	0	9	2	0	11	0	0	0	0	0	0	9	2	0	11	22	0
7:45	2	0	8	0	10	0	7	0	0	7	0	0	0	0	0	0	6	6	0	12	29	0
Total	4	0	12	0	16	0	22	4	0	26	0	0	0	0	0	0	28	18	0	46	88	0
8:00	3	0	6	0	9	0	4	1	0	5	0	0	0	0	0	0	10	9	0	19	33	0
8:15	1	0	12	0	13	0	1	1	0	2	0	0	0	0	0	0	9	7	0	16	31	0
8:30	3	0	6	0	9	0	2	0	0	2	0	0	0	0	0	0	5	10	0	15	26	0
8:45	2	0	16	0	18	0	3	1	0	4	0	0	0	0	0	0	5	4	0	9	31	0
Total	9	0	40	0	49	0	10	3	0	13	0	0	0	0	0	0	29	30	0	59	121	0
16:00	1	0	11	0	12	0	3	3	0	6	0	0	0	0	0	0	3	3	0	6	24	0
16:15	0	0	5	0	5	0	7	1	0	8	0	0	0	0	0	0	3	5	0	8	21	0
16:30	1	0	13	0	14	0	8	0	0	8	0	0	0	0	0	0	6	4	0	10	32	0
16:45	1	0	9	0	10	0	10	0	0	10	0	0	0	0	0	0	7	1	0	8	28	0
Total	3	0	38	0	41	0	28	4	0	32	0	0	0	0	0	0	19	13	0	32	105	0
17:00	0	0	5	0	5	0	6	0	0	6	0	0	0	0	0	0	11	6	0	17	28	0
17:15	0	0	10	0	10	0	2	1	0	3	0	0	0	0	0	0	9	0	0	9	22	0
17:30	1	0	4	0	5	0	2	0	0	2	0	0	0	0	0	0	6	4	0	10	17	0
17:45	1	0	9	0	10	0	7	1	0	8	0	0	0	0	0	0	6	1	0	7	25	0
Total	2	0	28	0	30	0	17	2	0	19	0	0	0	0	0	0	32	11	0	43	92	0
Grand Total	18	0	118	0	136	0	77	13	0	90	0	0	0	0	0	0	108	72	0	180	406	0
Apprch %	13.2%	0.0%	86.8%	0.0%		0.0%	85.6%	14.4%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	60.0%	40.0%	0.0%			
Total %	4.4%	0.0%	29.1%	0.0%	33.5%	0.0%	19.0%	3.2%	0.0%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.6%	17.7%	0.0%	44.3%	100.0%	

AM PEAK HOUR	I-80 WB On/Off-Ramps					W El Camino Ave					I-80 WB On/Off-Ramps					W El Camino Ave					
	Southbound					Westbound					Northbound					Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
7:00	0	0	3	0	3	0	3	1	0	4	0	0	0	0	0	0	7	6	0	13	20
7:15	2	0	1	0	3	0	3	1	0	4	0	0	0	0	0	0	6	4	0	10	17
7:30	0	0	0	0	0	0	9	2	0	11	0	0	0	0	0	0	9	2	0	11	22
7:45	2	0	8	0	10	0	7	0	0	7	0	0	0	0	0	0	6	6	0	12	29
Total Volume	4	0	12	0	16	0	22	4	0	26	0	0	0	0	0	0	28	18	0	46	88
% App Total	25.0%	0.0%	75.0%	0.0%		0.0%	84.6%	15.4%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	60.9%	39.1%	0.0%		
PHF	.500	.000	.375	.375	.400	.000	.611	.500	.500	.591	.000	.000	.000	.000	.000	.000	.778	.750	.750	.885	.759

PM PEAK HOUR	I-80 WB On/Off-Ramps					W El Camino Ave					I-80 WB On/Off-Ramps					W El Camino Ave					
	Southbound					Westbound					Northbound					Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	1	0	13	0	14	0	8	0	0	8	0	0	0	0	0	0	6	4	0	10	32
16:45	1	0	9	0	10	0	10	0	0	10	0	0	0	0	0	0	7	1	0	8	28
17:00	0	0	5	0	5	0	6	0	0	6	0	0	0	0	0	0	11	6	0	17	28
17:15	0	0	10	0	10	0	2	1	0	3	0	0	0	0	0	0	9	0	0	9	22
Total Volume	2	0	37	0	39	0	26	1	0	27	0	0	0	0	0	0	33	11	0	44	110
% App Total	5.1%	0.0%	94.9%	0.0%		0.0%	96.3%	3.7%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	75.0%	25.0%	0.0%		
PHF	.500	.000	.712	.712	.696	.000	.650	.250	.250	.675	.000	.000	.000	.000	.000	.000	.750	.458	.458	.647	.859

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-002
Date: 2/6/2020

Total

NS/EW Streets:	I-80 EB On/Off-Ramps				I-80 EB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	33	0	63	0	0	0	0	0	0	216	33	0	0	142	90	0	577
7:15 AM	24	0	66	0	0	0	0	0	0	252	35	0	0	130	125	0	632
7:30 AM	28	0	78	0	0	0	0	0	0	275	45	0	0	153	172	0	751
7:45 AM	32	0	114	0	0	0	0	0	0	262	41	0	0	153	210	0	812
8:00 AM	33	0	114	0	0	0	0	0	0	251	51	0	0	109	95	0	653
8:15 AM	29	0	83	0	0	0	0	0	0	284	33	0	0	102	65	0	596
8:30 AM	25	0	90	0	0	0	0	0	0	224	36	0	0	97	62	0	534
8:45 AM	32	0	92	0	0	0	0	0	0	181	24	0	0	87	59	0	475
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	236	0	700	0	0	0	0	0	0	1945	298	0	0	973	878	0	5030
APPROACH %'s :	25.21%	0.00%	74.79%	0.00%					0.00%	86.71%	13.29%	0.00%	0.00%	52.57%	47.43%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	117	0	372	0	0	0	0	0	0	1040	172	0	0	545	602	0	2848
PEAK HR FACTOR :	0.886	0.000	0.816	0.000	0.000	0.000	0.000	0.000	0.000	0.945	0.843	0.000	0.000	0.891	0.717	0.000	0.877
	0.832								0.947				0.790				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	104	0	147	0	0	0	0	0	0	116	15	0	0	167	134	0	683
4:15 PM	152	0	173	0	0	0	0	0	0	92	14	0	0	146	93	0	670
4:30 PM	166	0	167	0	0	0	0	0	0	118	23	0	0	188	144	0	806
4:45 PM	166	0	167	0	0	0	0	0	0	129	15	0	0	151	105	0	733
5:00 PM	154	0	195	0	0	0	0	0	0	107	20	0	0	162	137	0	775
5:15 PM	160	0	159	0	0	0	0	0	0	126	22	0	0	174	105	0	746
5:30 PM	183	0	184	0	0	0	0	0	0	131	16	0	0	125	97	0	736
5:45 PM	143	0	167	0	0	0	0	0	0	121	15	0	0	108	60	0	614
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1228	0	1359	0	0	0	0	0	0	940	140	0	0	1221	875	0	5763
APPROACH %'s :	47.47%	0.00%	52.53%	0.00%					0.00%	87.04%	12.96%	0.00%	0.00%	58.25%	41.75%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	646	0	688	0	0	0	0	0	0	480	80	0	0	675	491	0	3060
PEAK HR FACTOR :	0.973	0.000	0.882	0.000	0.000	0.000	0.000	0.000	0.000	0.930	0.870	0.000	0.000	0.898	0.852	0.000	0.949
	0.956								0.946				0.878				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-002
Date: 2/6/2020

Cars

NS/EW Streets:	I-80 EB On/Off-Ramps				I-80 EB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	31	0	60	0	0	0	0	0	0	216	26	0	0	140	89	0	562
7:15 AM	22	0	65	0	0	0	0	0	0	250	30	0	0	127	124	0	618
7:30 AM	21	0	74	0	0	0	0	0	0	274	36	0	0	150	169	0	724
7:45 AM	27	0	112	0	0	0	0	0	0	260	35	0	0	151	204	0	789
8:00 AM	29	0	114	0	0	0	0	0	0	249	41	0	0	108	95	0	636
8:15 AM	29	0	83	0	0	0	0	0	0	282	24	0	0	100	64	0	582
8:30 AM	23	0	89	0	0	0	0	0	0	222	29	0	0	97	62	0	522
8:45 AM	29	0	92	0	0	0	0	0	0	179	20	0	0	86	55	0	461
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	211	0	689	0	0	0	0	0	0	1932	241	0	0	959	862	0	4894
APPROACH %'s :	23.44%	0.00%	76.56%	0.00%					0.00%	88.91%	11.09%	0.00%	0.00%	52.66%	47.34%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	99	0	365	0	0	0	0	0	0	1033	142	0	0	536	592	0	2767
PEAK HR FACTOR :	0.85	0.000	0.800	0.000	0.000	0.000	0.000	0.000	0.000	0.943	0.866	0.000	0.000	0.887	0.725	0.000	0.877
	0.811								0.948				0.794				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	100	0	147	0	0	0	0	0	0	115	12	0	0	165	134	0	673
4:15 PM	145	0	171	0	0	0	0	0	0	92	11	0	0	145	93	0	657
4:30 PM	159	0	166	0	0	0	0	0	0	116	18	0	0	187	142	0	788
4:45 PM	157	0	167	0	0	0	0	0	0	127	10	0	0	150	105	0	716
5:00 PM	148	0	194	0	0	0	0	0	0	106	9	0	0	162	137	0	756
5:15 PM	158	0	159	0	0	0	0	0	0	125	14	0	0	173	104	0	733
5:30 PM	180	0	182	0	0	0	0	0	0	129	11	0	0	125	96	0	723
5:45 PM	139	0	166	0	0	0	0	0	0	120	9	0	0	105	60	0	599
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1186	0	1352	0	0	0	0	0	0	930	94	0	0	1212	871	0	5645
APPROACH %'s :	46.73%	0.00%	53.27%	0.00%					0.00%	90.82%	9.18%	0.00%	0.00%	58.19%	41.81%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	622	0	686	0	0	0	0	0	0	474	51	0	0	672	488	0	2993
PEAK HR FACTOR :	0.98	0.000	0.884	0.000	0.000	0.000	0.000	0.000	0.000	0.933	0.708	0.000	0.000	0.898	0.859	0.000	0.950
	0.956								0.944				0.881				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-002
Date: 2/6/2020

HT

NS/EW Streets:	I-80 EB On/Off-Ramps				I-80 EB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	0	3	0	0	0	0	0	0	0	7	0	0	2	1	0	15
7:15 AM	2	0	1	0	0	0	0	0	0	2	5	0	0	3	1	0	14
7:30 AM	7	0	4	0	0	0	0	0	0	1	9	0	0	3	3	0	27
7:45 AM	5	0	2	0	0	0	0	0	0	2	6	0	0	2	6	0	23
8:00 AM	4	0	0	0	0	0	0	0	0	2	10	0	0	1	0	0	17
8:15 AM	0	0	0	0	0	0	0	0	0	2	9	0	0	2	1	0	14
8:30 AM	2	0	1	0	0	0	0	0	0	2	7	0	0	0	0	0	12
8:45 AM	3	0	0	0	0	0	0	0	0	2	4	0	0	1	4	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	25	0	11	0	0	0	0	0	0	13	57	0	0	14	16	0	136
APPROACH %'s :	69.44%	0.00%	30.56%	0.00%					0.00%	18.57%	81.43%	0.00%	0.00%	46.67%	53.33%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	18	0	7	0	0	0	0	0	0	7	30	0	0	9	10	0	81
PEAK HR FACTOR :	0.643	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.750	0.000	0.000	0.750	0.417	0.000	0.750
	0.568								0.771				0.594				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	0	0	0	0	0	0	0	0	1	3	0	0	2	0	0	10
4:15 PM	7	0	2	0	0	0	0	0	0	0	3	0	0	1	0	0	13
4:30 PM	7	0	1	0	0	0	0	0	0	2	5	0	0	1	2	0	18
4:45 PM	9	0	0	0	0	0	0	0	0	2	5	0	0	1	0	0	17
5:00 PM	6	0	1	0	0	0	0	0	0	1	11	0	0	0	0	0	19
5:15 PM	2	0	0	0	0	0	0	0	0	1	8	0	0	1	1	0	13
5:30 PM	3	0	2	0	0	0	0	0	0	2	5	0	0	0	1	0	13
5:45 PM	4	0	1	0	0	0	0	0	0	1	6	0	0	3	0	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	42	0	7	0	0	0	0	0	0	10	46	0	0	9	4	0	118
APPROACH %'s :	85.71%	0.00%	14.29%	0.00%					0.00%	17.86%	82.14%	0.00%	0.00%	69.23%	30.77%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	24	0	2	0	0	0	0	0	0	6	29	0	0	3	3	0	67
PEAK HR FACTOR :	0.67	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.659	0.000	0.000	0.750	0.375	0.000	0.882
	0.722								0.729				0.500				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB On/Off-Ramps & W El Camino Ave
City: Sacramento
Control: Signalized

Project ID: 20-07035-002
Date: 2/6/2020

Bikes

NS/EW Streets:	I-80 EB On/Off-Ramps				I-80 EB On/Off-Ramps				W El Camino Ave				W El Camino Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	3
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	3
PEAK HR FACTOR :	0.00	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.375
	0.250								0.250				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-80 EB On/Off-Ramps & W El Camino Ave
City: Sacramento

Project ID: 20-07035-002
Date: 2/6/2020

Pedestrians (Crosswalks)

NS/EW Streets:	I-80 EB On/Off-Ramps		I-80 EB On/Off-Ramps		W El Camino Ave		W El Camino Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	1
APPROACH %'s :			100.00%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM								TOTAL
PEAK HR VOL :	0	0	1	0	0	0	0	0	1
PEAK HR FACTOR :			0.250						0.250
			0.250						

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

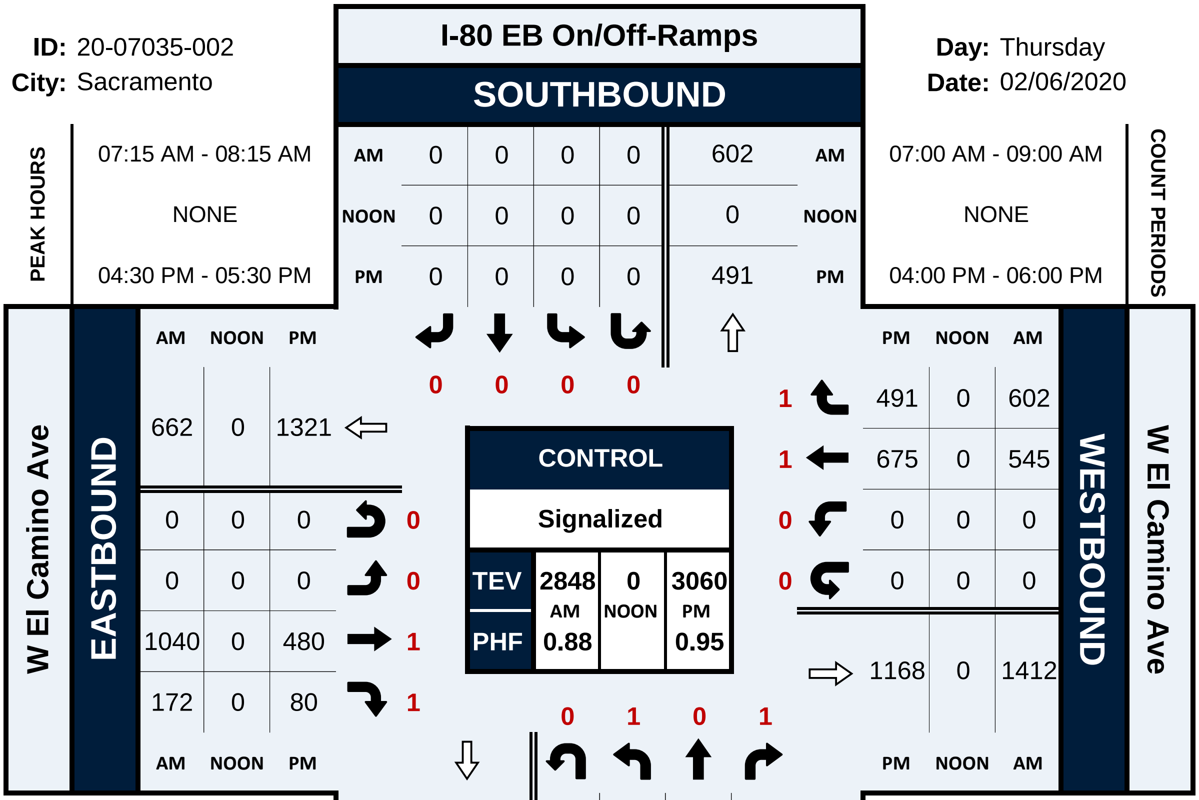
I-80 EB On/Off-Ramps & W El Camino Ave

Peak Hour Turning Movement Count

ID: 20-07035-002
City: Sacramento

Day: Thursday
Date: 02/06/2020

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM



I-80 EB On/Off-Ramps — SOUTHBOUND

	↲	↓	↳	U	⇧
AM	0	0	0	0	602
NOON	0	0	0	0	0
PM	0	0	0	0	491
	0	0	0	0	

W El Camino Ave — EASTBOUND

	AM	NOON	PM	
⇦	662	0	1321	
U	0	0	0	0
↱	0	0	0	0
→	1040	0	480	1
↴	172	0	80	1

W El Camino Ave — WESTBOUND

		PM	NOON	AM
1	↰	491	0	602
1	←	675	0	545
0	↲	0	0	0
0	U	0	0	0
	⇨	1168	0	1412

I-80 EB On/Off-Ramps — NORTHBOUND

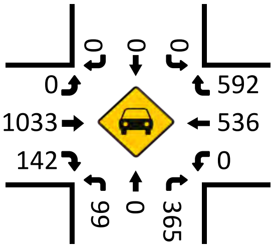
	⇩	U	↰	↑	↱
		0	1	0	1
PM	80	0	646	0	688
NOON	0	0	0	0	0
AM	172	0	117	0	372

CONTROL

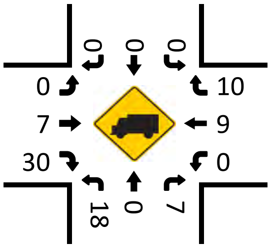
Signalized

	AM	NOON	PM
TEV	2848	0	3060
PHF	0.88		0.95

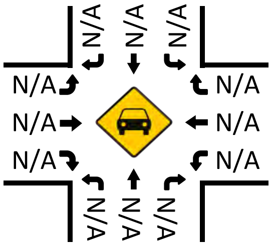
Cars (AM)



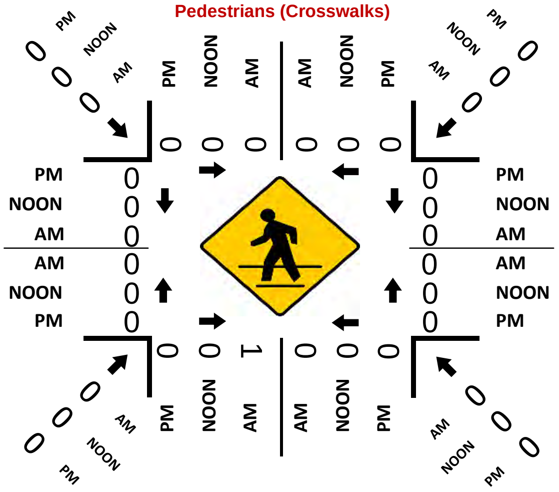
HT (AM)



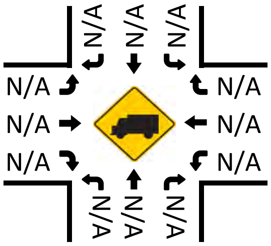
Cars (NOON)



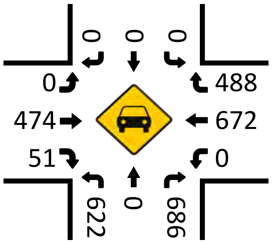
Pedestrians (Crosswalks)



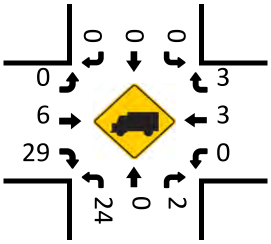
HT (NOON)



Cars (PM)



HT (PM)



File Name: 20-07035-002
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 EB On/Off-Ramps				W El Camino Ave				I-80 EB On/Off-Ramps				W El Camino Ave				
	Southbound				Westbound				Northbound				Eastbound				
Start Time	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	577
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1209
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1960
7:00 AM	0	0	0	0	0	142	90	0	33	0	63	0	0	216	33	0	2772
7:15 AM	0	0	0	0	0	130	125	0	24	0	66	0	0	252	35	0	2848
7:30 AM	0	0	0	0	0	153	172	0	28	0	78	0	0	275	45	0	2812
7:45 AM	0	0	0	0	0	153	210	0	32	0	114	0	0	262	41	0	2595
8:00 AM	0	0	0	0	0	109	95	0	33	0	114	0	0	251	51	0	2258
8:15 AM	0	0	0	0	0	102	65	0	29	0	83	0	0	284	33	0	1605
8:30 AM	0	0	0	0	0	97	62	0	25	0	90	0	0	224	36	0	1009
8:45 AM	0	0	0	0	0	87	59	0	32	0	92	0	0	181	24	0	475
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	683
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1353
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2159
4:00 PM	0	0	0	0	0	167	134	0	104	0	147	0	0	116	15	0	2892
4:15 PM	0	0	0	0	0	146	93	0	152	0	173	0	0	92	14	0	2984
4:30 PM	0	0	0	0	0	188	144	0	166	0	167	0	0	118	23	0	3060
4:45 PM	0	0	0	0	0	151	105	0	166	0	167	0	0	129	15	0	2990
5:00 PM	0	0	0	0	0	162	137	0	154	0	195	0	0	107	20	0	2871
5:15 PM	0	0	0	0	0	174	105	0	160	0	159	0	0	126	22	0	2096
5:30 PM	0	0	0	0	0	125	97	0	183	0	184	0	0	131	16	0	1350
5:45 PM	0	0	0	0	0	108	60	0	143	0	167	0	0	121	15	0	614
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: 20-07035-002
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 EB On/Off-Ramps				W El Camino Ave				I-80 EB On/Off-Ramps				W El Camino Ave				
	Southbound				Westbound				Northbound				Eastbound				
Start Time	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	LEFT	THRU	RIGHT	PEDS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: 20-07035-002
Start Date: 02/06/2020
Start Time: 7:00 AM
Site Code:
Comment 1: City of Sacramento
Comment 2:
Comment 3:
Comment 4:

	I-80 EB On/Off-Ramps				W El Camino Ave				I-80 EB On/Off-Ramps				W El Camino Ave				
	Southbound				Westbound				Northbound				Eastbound				
Start Time	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	LEFT	THRU	RIGHT	UTURNS	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
7:00 AM	0	0	0	0	0	2	1	0	2	0	3	0	0	0	7	0	79
7:15 AM	0	0	0	0	0	3	1	0	2	0	1	0	0	2	5	0	81
7:30 AM	0	0	0	0	0	3	3	0	7	0	4	0	0	1	9	0	81
7:45 AM	0	0	0	0	0	2	6	0	5	0	2	0	0	2	6	0	66
8:00 AM	0	0	0	0	0	1	0	0	4	0	0	0	0	2	10	0	57
8:15 AM	0	0	0	0	0	2	1	0	0	0	0	0	0	2	9	0	40
8:30 AM	0	0	0	0	0	0	0	0	2	0	1	0	0	2	7	0	26
8:45 AM	0	0	0	0	0	1	4	0	3	0	0	0	0	2	4	0	14
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
4:00 PM	0	0	0	0	0	2	0	0	4	0	0	0	0	1	3	0	58
4:15 PM	0	0	0	0	0	1	0	0	7	0	2	0	0	0	3	0	67
4:30 PM	0	0	0	0	0	1	2	0	7	0	1	0	0	2	5	0	67
4:45 PM	0	0	0	0	0	1	0	0	9	0	0	0	0	2	5	0	62
5:00 PM	0	0	0	0	0	0	0	0	6	0	1	0	0	1	11	0	60
5:15 PM	0	0	0	0	0	1	1	0	2	0	0	0	0	1	8	0	41
5:30 PM	0	0	0	0	0	0	1	0	3	0	2	0	0	2	5	0	28
5:45 PM	0	0	0	0	0	3	0	0	4	0	1	0	0	1	6	0	15
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700

orders@atdtraffic.com

File Name : 20-07035-002
Date : 02/06/2020

Unshifted Count = All Vehicles & Uturns

	I-80 EB On/Off-Ramps					W El Camino Ave					I-80 EB On/Off-Ramps					W El Camino Ave						
	Southbound					Westbound					Northbound					Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	0	0	0	0	0	142	90	0	232	33	0	63	0	96	0	216	33	0	249	577	0
7:15	0	0	0	0	0	0	130	125	0	255	24	0	66	0	90	0	252	35	0	287	632	0
7:30	0	0	0	0	0	0	153	172	0	325	28	0	78	0	106	0	275	45	0	320	751	0
7:45	0	0	0	0	0	0	153	210	0	363	32	0	114	0	146	0	262	41	0	303	812	0
Total	0	0	0	0	0	0	578	597	0	1175	117	0	321	0	438	0	1005	154	0	1159	2772	0
8:00	0	0	0	0	0	0	109	95	0	204	33	0	114	0	147	0	251	51	0	302	653	0
8:15	0	0	0	0	0	0	102	65	0	167	29	0	83	0	112	0	284	33	0	317	596	0
8:30	0	0	0	0	0	0	97	62	0	159	25	0	90	0	115	0	224	36	0	260	534	0
8:45	0	0	0	0	0	0	87	59	0	146	32	0	92	0	124	0	181	24	0	205	475	0
Total	0	0	0	0	0	0	395	281	0	676	119	0	379	0	498	0	940	144	0	1084	2258	0
16:00	0	0	0	0	0	0	167	134	0	301	104	0	147	0	251	0	116	15	0	131	683	0
16:15	0	0	0	0	0	0	146	93	0	239	152	0	173	0	325	0	92	14	0	106	670	0
16:30	0	0	0	0	0	0	188	144	0	332	166	0	167	0	333	0	118	23	0	141	806	0
16:45	0	0	0	0	0	0	151	105	0	256	166	0	167	0	333	0	129	15	0	144	733	0
Total	0	0	0	0	0	0	652	476	0	1128	588	0	654	0	1242	0	455	67	0	522	2892	0
17:00	0	0	0	0	0	0	162	137	0	299	154	0	195	0	349	0	107	20	0	127	775	0
17:15	0	0	0	0	0	0	174	105	0	279	160	0	159	0	319	0	126	22	0	148	746	0
17:30	0	0	0	0	0	0	125	97	0	222	183	0	184	0	367	0	131	16	0	147	736	0
17:45	0	0	0	0	0	0	108	60	0	168	143	0	167	0	310	0	121	15	0	136	614	0
Total	0	0	0	0	0	0	569	399	0	968	640	0	705	0	1345	0	485	73	0	558	2871	0
Grand Total	0	0	0	0	0	0	2194	1753	0	3947	1464	0	2059	0	3523	0	2885	438	0	3323	10793	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	55.6%	44.4%	0.0%		41.6%	0.0%	58.4%	0.0%		0.0%	86.8%	13.2%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.3%	16.2%	0.0%	36.6%	13.6%	0.0%	19.1%	0.0%	32.6%	0.0%	26.7%	4.1%	0.0%	30.8%	100.0%	

AM PEAK HOUR	I-80 EB On/Off-Ramps					W El Camino Ave					I-80 EB On/Off-Ramps					W El Camino Ave					
	Southbound					Westbound					Northbound					Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	0	0	0	0	0	0	130	125	0	255	24	0	66	0	90	0	252	35	0	287	632
7:30	0	0	0	0	0	0	153	172	0	325	28	0	78	0	106	0	275	45	0	320	751
7:45	0	0	0	0	0	0	153	210	0	363	32	0	114	0	146	0	262	41	0	303	812
8:00	0	0	0	0	0	0	109	95	0	204	33	0	114	0	147	0	251	51	0	302	653
Total Volume	0	0	0	0	0	0	545	602	0	1147	117	0	372	0	489	0	1040	172	0	1212	2848
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	47.5%	52.5%	0.0%		23.9%	0.0%	76.1%	0.0%		0.0%	85.8%	14.2%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.891	.717	.000	.790	.886	.000	.816	.000	.832	.000	.945	.843	.000	.947	.877

PM PEAK HOUR	I-80 EB On/Off-Ramps					W El Camino Ave					I-80 EB On/Off-Ramps					W El Camino Ave					
	Southbound					Westbound					Northbound					Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	0	188	144	0	332	166	0	167	0	333	0	118	23	0	141	806
16:45	0	0	0	0	0	0	151	105	0	256	166	0	167	0	333	0	129	15	0	144	733
17:00	0	0	0	0	0	0	162	137	0	299	154	0	195	0	349	0	107	20	0	127	775
17:15	0	0	0	0	0	0	174	105	0	279	160	0	159	0	319	0	126	22	0	148	746
Total Volume	0	0	0	0	0	0	675	491	0	1166	646	0	688	0	1334	0	480	80	0	560	3060
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	57.9%	42.1%	0.0%		48.4%	0.0%	51.6%	0.0%		0.0%	85.7%	14.3%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.898	.852	.000	.878	.973	.000	.882	.000	.956	.000	.930	.870	.000	.946	.949

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700
orders@atdtraffic.com

File Name : 20-07035-002
Date : 02/06/2020

Bank 1 Count = Bikes & Peds

	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	0	2	0	0	2	4	1
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	25.0%	0.0%		25.0%	0.0%	0.0%	25.0%		25.0%	0.0%	50.0%	0.0%		50.0%	100.0%	

AM PEAK HOUR	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.250

PM PEAK HOUR	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
17:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	3
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.250		.250	.000	.250	.000		.250	.375

ALL TRAFFIC DATA

City of Sacramento

(916) 771-8700

orders@atdtraffic.com

File Name : 20-07035-002
Date : 02/06/2020

Bank 2 Count = HT

	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	0	0	0	0	0	2	1	0	3	2	0	3	0	5	0	0	7	0	7	15	0
7:15	0	0	0	0	0	0	3	1	0	4	2	0	1	0	3	0	2	5	0	7	14	0
7:30	0	0	0	0	0	0	3	3	0	6	7	0	4	0	11	0	1	9	0	10	27	0
7:45	0	0	0	0	0	0	2	6	0	8	5	0	2	0	7	0	2	6	0	8	23	0
Total	0	0	0	0	0	0	10	11	0	21	16	0	10	0	26	0	5	27	0	32	79	0
8:00	0	0	0	0	0	0	1	0	0	1	4	0	0	0	4	0	2	10	0	12	17	0
8:15	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	2	9	0	11	14	0
8:30	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	0	2	7	0	9	12	0
8:45	0	0	0	0	0	0	1	4	0	5	3	0	0	0	3	0	2	4	0	6	14	0
Total	0	0	0	0	0	0	4	5	0	9	9	0	1	0	10	0	8	30	0	38	57	0
16:00	0	0	0	0	0	0	2	0	0	2	4	0	0	0	4	0	1	3	0	4	10	0
16:15	0	0	0	0	0	0	1	0	0	1	7	0	2	0	9	0	0	3	0	3	13	0
16:30	0	0	0	0	0	0	1	2	0	3	7	0	1	0	8	0	2	5	0	7	18	0
16:45	0	0	0	0	0	0	1	0	0	1	9	0	0	0	9	0	2	5	0	7	17	0
Total	0	0	0	0	0	0	5	2	0	7	27	0	3	0	30	0	5	16	0	21	58	0
17:00	0	0	0	0	0	0	0	0	0	0	6	0	1	0	7	0	1	11	0	12	19	0
17:15	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	0	1	8	0	9	13	0
17:30	0	0	0	0	0	0	0	1	0	1	3	0	2	0	5	0	2	5	0	7	13	0
17:45	0	0	0	0	0	0	3	0	0	3	4	0	1	0	5	0	1	6	0	7	15	0
Total	0	0	0	0	0	0	4	2	0	6	15	0	4	0	19	0	5	30	0	35	60	0
Grand Total	0	0	0	0	0	0	23	20	0	43	67	0	18	0	85	0	23	103	0	126	254	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	53.5%	46.5%	0.0%		78.8%	0.0%	21.2%	0.0%		0.0%	18.3%	81.7%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	7.9%	0.0%	16.9%	26.4%	0.0%	7.1%	0.0%	33.5%	0.0%	9.1%	40.6%	0.0%	49.6%	100.0%	

AM PEAK HOUR	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	0	0	0	0	0	0	3	1	0	4	2	0	1	0	3	0	2	5	0	7	14
7:30	0	0	0	0	0	0	3	3	0	6	7	0	4	0	11	0	1	9	0	10	27
7:45	0	0	0	0	0	0	2	6	0	8	5	0	2	0	7	0	2	6	0	8	23
8:00	0	0	0	0	0	0	1	0	0	1	4	0	0	0	4	0	2	10	0	12	17
Total Volume	0	0	0	0	0	0	9	10	0	19	18	0	7	0	25	0	7	30	0	37	81
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	47.4%	52.6%	0.0%		72.0%	0.0%	28.0%	0.0%		0.0%	18.9%	81.1%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.750	.417	.417	.594	.643	.000	.438	.438	.568	.000	.875	.750	.750	.771	.750

PM PEAK HOUR	I-80 EB On/Off-Ramps Southbound					W El Camino Ave Westbound					I-80 EB On/Off-Ramps Northbound					W El Camino Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	0	1	2	0	3	7	0	1	0	8	0	2	5	0	7	18
16:45	0	0	0	0	0	0	1	0	0	1	9	0	0	0	9	0	2	5	0	7	17
17:00	0	0	0	0	0	0	0	0	0	0	6	0	1	0	7	0	1	11	0	12	19
17:15	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	0	1	8	0	9	13
Total Volume	0	0	0	0	0	0	3	3	0	6	24	0	2	0	26	0	6	29	0	35	67
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	50.0%	50.0%	0.0%		92.3%	0.0%	7.7%	0.0%		0.0%	17.1%	82.9%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.750	.375	.375	.500	.667	.000	.500	.500	.722	.000	.750	.659	.659	.729	.882

2020 STREETLIGHT TRAFFIC VOLUME ESTIMATES

StreetLight Peak Hour Volume Estimates - February 2020 Tuesday, Wednesday, Thursday													
		Turning Movement											
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
AM Peak Hour	1 West El Camino Avenue & I-80 Westbound Ramps				846		282		545	685		273	222
	2 West El Camino Avenue & I-80 Eastbound Ramps	101		186					1,261	130		394	488
	3 West El Camino Avenue & Orchard Lane	341	7	200	14	2	5	30	903	263	163	385	9
	4 West El Camino Avenue & West River Drive	4	0	160	0	0	7	0	1,035	0	281	531	38
	5 West El Camino Avenue & Unity Park Street	0	0	17	0	0	0	0	1,288	22	0	863	0
	6 West El Camino Avenue & Gateway Oaks Drive	268	76	95	93	13	17	241	350	401	113	522	362
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
PM Peak Hour	1 West El Camino Avenue & I-80 Westbound Ramps				313		210		148	264		889	263
	2 West El Camino Avenue & I-80 Eastbound Ramps	676		501					409	52		476	387
	3 West El Camino Avenue & Orchard Lane	121	1	134	12	1	4	2	638	98	188	699	0
	4 West El Camino Avenue & West River Drive	0	0	89	5	0	5	6	779	28	64	864	5
	5 West El Camino Avenue & Unity Park Street	0	0	13	0	0	0	0	860	49	0	928	0
	6 West El Camino Avenue & Gateway Oaks Drive	277	44	149	357	88	223	29	590	114	108	298	71

TRIP GENERATION MEMORANDUM

8950 CAL CENTER DRIVE, SUITE 340, SACRAMENTO, CA 95826 • 916.368.2000 • DKSASSOCIATES.COM

TRIP GENERATION

DATE: July 27, 2020

TO: Aelita Milatzo, Pelle Clarke | City of Sacramento

FROM: Vic Maslanka, Josh Pilachowski | DKS Associates

SUBJECT: River Oaks Marketplace Project #19179-006

This memorandum summarizes the trip generation analysis of the River Oaks Marketplace project located at the northwest corner of West El Camino Avenue and Orchard Lane in the City of Sacramento.

BACKGROUND

The River Oaks Marketplace project consists of 13,657 square feet of commercial space. Figure 1 illustrates the project location and adjacent properties. The project plan shows uses that include a 7-Eleven (comprised of a Community Market, Restaurant, and Fuel Station), a McDonald's Restaurant with Drive-Through, a Dutch Brothers Coffee Shop with Drive-Through, and a Car Wash. Adjacent properties include The Cove residential development across Orchard Lane to the east (currently under construction and partially occupied), The Core Natomas apartments under construction to the north, and a vacant parcel to the west.

PROJECT DESCRIPTION AND ESTIMATED TRIP GENERATION

Vehicular trip generation of the project has been estimated using the following sources:

- ITE Trip Generation, Tenth Edition.
- ITE Trip Generation Handbook, Second Edition.
- ITE Trip Generation Handbook, Third Edition.
- Literature review of trip generation data for Dutch Brothers and Car Wash uses.

FIGURE 1: PROJECT LOCATION

PROJECT COMPONENTS

Table 1 summarizes the components of the project and adjacent properties.

SINGLE USE TRIP GENERATION

Table 2 summarizes the trip generation of the project components and adjacent properties as stand-alone uses. No credits have been taken for alternate mode uses, as travel in the area is predominantly auto oriented at this time.

7-ELEVEN

The 7-Eleven trip generation is calculated from the ITE land use code 960, Super Convenience Market / Gas Station. The multi-variable equations (combining building size and fueling positions) were used for the AM and PM peak hours. The daily value is based upon the average of the daily volumes calculated from building size and fuel position rates.

MCDONALDS

All trip generation is based upon ITE rates for land use code 934, Fast-Food Restaurant with Drive-Thru.

TABLE 1: PROJECT COMPONENTS AND ASSOCIATED ITE LAND USE CATEGORIES

PROPERTY	COMPONENT	SIZE	ITE LAND USE CODE(S)	ITE USE(S)
RIVER OAKS MARKETPLACE	7-Eleven	4,650 SF 20 fueling positions	960	Super Convenience Market / Gas Station
	McDonalds	4,500 SF	934	Fast-Food Restaurant with Drive-Thru
	Dutch Brothers	880 SF	938[a]	Coffee/Donut Shop with Drive-Thru and No Indoor Seating
	Car Wash	3,627 SF 1 Tunnel	948[b]	Automated Car Wash
THE CORE NATOMAS	Apartments	300 DU	220	Multifamily Housing (Low-Rise)
THE COVE	Single-Family	435 DU	210	Single Family Detached Housing
	Townhouses	156 DU	220	Multifamily Housing (Low-Rise)
VACANT PROPERTY	Hotel[c]	120 Rooms[c]	310	Hotel

[a] Limited data; building size out of range.

[b] Limited data; limited time periods.

[c] Assumed land use for analysis purposes.

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

DUTCH BROTHERS

The ITE data for a Coffee/Donut Shop with Drive Thru and No Indoor Seating (Code 938) is limited and inappropriate for Dutch Brothers. The ITE data is based upon three much smaller coffee kiosks of 90 square feet each.

Fehr and Peers Associates collected PM peak hour trip generation data on February 5, 2020, at two Dutch Brothers locations (Roseville and Elk Grove) with similar characteristics. This data has been used by the City in the analysis of a Dutch Brothers project on Northgate Boulevard. The PM peak hour data is shown in Table 2 and will be used for this project.

For the AM peak hour, Crane Transportation Group compiled AM and PM peak hour data at three Dutch Brothers locations in Lodi, Oakley, and Stockton California on October 3, 2019. Compared to the PM peak hour, the AM peak hour volumes vary from 76 percent to 171 percent. An average value of 133 percent of the PM peak hour was applied to the AM peak hour.

TABLE 2: SINGLE USE TRIP GENERATION

PROPERTY	COMPONENT	DAILY	AM PEAK HOUR			PM PEAK HOUR		
			ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
RIVER OAKS MARKETPLACE	7-Eleven	4,253	234	233	467	195	194	389
	McDonalds	2,119	92	89	181	76	71	147
	Dutch Brothers	1,793	108	107	215	81	81	162
	Car Wash	748	22	22	44	39	39	78
	Total	8,913	456	451	907	391	385	776
THE CORE NATOMAS	Apartments	2,227	31	104	135	99	58	157
THE COVE	Single-Family	4,021	79	235	314	263	154	417
	Townhouses	1,139	17	56	73	55	33	88
	Total	5,160	96	291	387	318	187	505
VACANT PROPERTY	Hotel	1,468	46	34	80	43	44	87

Source: ITE Trip Generation, Tenth Edition, 2017 as updated; DKS Associates, 2020.

For daily volumes, the ratio of daily trips to peak hour trips (AM and PM combined) from the ITE data was utilized.

CAR WASH

The ITE data for an automated car wash (Code 948) is limited to rates for the PM peak, which are used for the project.

For the AM peak hour, data collected at car washes in Montebello, Newport Beach, and Rialto in 2014 and 2015 were utilized. During the AM peak hour, the volumes varied from 45 to 72 percent of the PM peak hour volumes. An average value of 57 percent of the PM peak hour was applied to the AM peak hour.

For daily volumes, the ratio of daily trips to peak hour trips (AM and PM combined) from the Montebello car wash was utilized.

THE CORE NATOMAS

All trip generation is based upon ITE equations for land use code 220, Multifamily Housing.

THE COVE

All trip generation is based upon ITE equations for land use codes 210 and 220, Single Family Detached Housing and Multifamily Housing, respectively.

HOTEL

ITE equations are used for the AM and PM peak hours, and ITE rate for daily volumes. These are based upon land use code 310, Hotel.

INTERNAL TRIPS

Because multiple uses are located on the same site, as well as off-site nearby, some patrons may visit more than one land use. This reduces the number of trips at the driveway compared to stand-alone uses, as these trips are typically made as pedestrians. The reduced trips are called internal trips.

Internal trips were calculated for the four River Oak Marketplace uses and The Core Natomas.

Although some pedestrian trips will be made to the project from The Cove, internal trips were not calculated as The Cove is not considered to be part of a mixed-use development. The design of The Cove limits direct access, as a privacy wall has been constructed along Orchard Lane and West El Camino Avenue.

No internal trips were calculated for the hotel since the land use is uncertain.

Internal trips were calculated in a two-step process:

1. For the retail uses (7-Eleven and Car Wash), the number of internal trips between the uses was estimated.

2. Following the first step, the number of internal trips were estimated between the retail uses, restaurant uses, and apartments.

3. No internal trips were assumed between the restaurants.

Table 3 summarizes the unconstrained internal trip percentages that were applied to the uses. Because of incomplete ITE data, percentages for some time periods were estimated from available data. Each unconstrained internal trip percentage is applied at the origin and destination of the trip. The resultant constrained number of internal trips is the lesser of the origin and destination estimates.

TABLE 3: UNCONSTRAINED INTERNAL TRIP PERCENTAGES

		DAILY	AM PEAK HOUR	PM PEAK HOUR
APPLIED TO TRIP ORIGINS				
FROM RETAIL	TO RETAIL	30%	20%	20%
	TO RESTAURANT	21%	13%	29%
	TO RESIDENTIAL	20%	14%	26%
FROM RESTAURANT	TO RETAIL	28%	14%	41%
	TO RESIDENTIAL	11%	4%	18%
FROM RESIDENTIAL	TO RETAIL	22%	1%	42%
	TO RESTAURANT	21%	20%	21%
APPLIED TO TRIP ORIGINS				
TO RETAIL	FROM RETAIL	28%	20%	20%
	FROM RESTAURANT	22%	14%	30%
	FROM RESIDENTIAL	14%	17%	10%
TO RESTAURANT	FROM RETAIL	40%	50%	29%
	FROM RESIDENTIAL	17%	20%	14%
TO RESIDENTIAL	FROM RETAIL	24%	2%	46%
	FROM RESTAURANT	11%	5%	16%

Source: ITE Trip Generation Handbook, Second Edition, 2004; ITE Trip Generation Handbook, Third Edition, 2014; DKS Associates, 2020.

PASS-BY TRIPS

Pass-by trips are trips that access the project site that are already on the roadway network driving past the site. While these trips are counted at the driveways, they are not new trips. Table 4 summarizes the pass-by trip percentages utilized for the land use categories.

TABLE 4: PASS-BY TRIP PERCENTAGES

LAND USE	ITE CODE	DAILY	AM PEAK HOUR	PM PEAK HOUR
7-ELEVEN	945 – Gasoline / Service Station with Convenience Market	59%	62%	56%
MCDONALDS	934 – Fast-Food Restaurant with Drive-Through Window	50%	49%	50%
DUTCH BROTHERS	Estimate	70%	70%	70%
CAR WASH	Estimate	25%	25%	25%

Source: ITE Trip Generation Handbook, Third Edition, 2014; DKS Associates, 2020.

7-ELEVEN

There is no pass-by trip information for land use code 960 (Super Convenience Market / Gas Station), so land use code 945 (Gasoline / Service Station with Convenience Market) was substituted as a similar use.

MCDONALDS

The appropriate pass-by information for land use code 934 (Fast-Food Restaurant with Drive-Through Window) was utilized.

DUTCH BROTHERS

There is no appropriate ITE pass-by percentage for this use. The pass-by percentage was estimated at 70 percent, consistent with the recent City Dutch Brothers study on Northgate Boulevard.

CAR WASH

There is no appropriate ITE pass-by percentage for this use. The pass-by percentage was conservatively estimated at 25 percent.

VEHICULAR TRIP GENERATION ESTIMATES

Table 5 summarizes the trip generation estimates. The project is estimated to generate 2,500 new external daily trips, 307 during the a.m. peak hour, and 199 during the p.m. peak hour.

TABLE 5: VEHICULAR TRIP GENERATION ESTIMATES

	DAILY	AM PEAK HOUR			PM PEAK HOUR		
		ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
RIVER OAKS MARKETPLACE							
1. SINGLE USE TRIPS (SEE TABLE 2)	8,913	456	451	907	391	385	776
2. INTERNAL TRIPS	-3,181	-79	-70	-149	-156	-180	-335
3. DRIVEWAY TRIPS (1. MINUS 2.)	5,731	377	381	758	235	205	441
4. PASS-BY TRIPS	-3,231	-224	-227	-451	-130	-112	-242
5. NEW EXTERNAL TRIPS (3. MINUS 4.)	2,500	153	154	307	106	93	199

Source: ITE Trip Generation, Tenth Edition, 2017; ITE Trip Generation Handbook, Second Edition, 2004; ITE Trip Generation Handbook, Third Edition, 2014; and DKS Associates., 2020.

APPENDIX

ITE LAND USE CODES

Land Use: 210
Single-Family Detached Housing

Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project, and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas, and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:00 and 5:00 p.m., respectively. For the two sites with Saturday data, the overall highest vehicle volume was counted between 3:00 and 4:00 p.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 10:15 and 11:15 a.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Delaware, Illinois, Indiana, Maryland, Minnesota, Montana, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, and Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 903, 925, 936

Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.

Source Numbers

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

Land Use: 310
Hotel

Description

A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. All suites hotel (Land Use 311), business hotel (Land Use 312), motel (Land Use 320), and resort hotel (Land Use 330) are related uses.

Additional Data

Studies of hotel employment density indicate that, on the average, a hotel will employ 0.9 employees per room.[1]

Twenty-five studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 82 percent.

Some properties contained in this land use provide guest transportation services such as airport shuttles, limousine service, or golf course shuttle service, which may have an impact on the overall trip generation rates.

Time-of-day distribution data for this land use are presented in Appendix A. For the one center city core site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 a.m. and 3:15 and 4:15 p.m., respectively. On Saturday and Sunday, the peak hours were between 5:00 and 6:00 p.m. and 10:15 and 11:15 a.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, District of Columbia, Florida, Georgia, Indiana, Minnesota, New York, Pennsylvania, South Dakota, Texas, Vermont, Virginia, and Washington.

For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.

Trip generation at a hotel may be related to the presence of supporting facilities such as convention facilities, restaurants, meeting/banquet space, and retail facilities. Future data submissions should specify the presence of these amenities. Reporting the level of activity at the supporting facilities such as full, empty, partially active, number of people attending a meeting/banquet during observation may also be useful in further analysis of this land use.

Source Numbers

170, 260, 262, 277, 280, 301, 306, 357, 422, 507, 577, 728, 867, 872, 925, 951

---

[1] Buttke, Carl H. Unpublished studies of building employment densities, Portland, Oregon.

Land Use: 853
Convenience Market with Gasoline Pumps

Description

This land use includes convenience markets with gasoline pumps where the primary business is the selling of convenience items, not the fueling of motor vehicles. The sites included in this land use category have the following two specific characteristics:

- The gross floor area of the convenience market is at least 2,000 gross square feet
- The number of vehicle fueling positions is less than 10

Convenience market (Land Use 851), gasoline/service station (Land Use 944), gasoline/service station with convenience market (Land Use 945), and super convenience market/gas station (Land Use 960) are related uses.

Additional Data

The independent variable, vehicle fueling positions, is defined as the maximum number of vehicles that can be fueled simultaneously.

Time-of-day distribution data for this land use are presented in Appendix A. For the 31 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:30 and 8:30 a.m. and 4:45 and 5:45 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), Arkansas, Delaware, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, New Hampshire, Rhode Island, South Dakota, Texas, Vermont, and Washington.

Source Numbers

221, 274, 288, 300, 340, 350, 351, 352, 355, 359, 718, 810, 813, 853, 882, 883, 888, 926, 927, 936, 977

Land Use: 934
Fast-Food Restaurant with Drive-Through Window

Description

This category includes fast-food restaurants with drive-through windows. This type of restaurant is characterized by a large drive-through clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. These limited-service eating establishments do not provide table service. Non-drive-through patrons generally order at a cash register and pay before they eat. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

The outdoor seating area is not included in the overall gross floor area. Therefore, the number of seats may be a more reliable independent variable on which to establish trip generation rates for facilities having significant outdoor seating.

Time-of-day distribution data for this land use for a weekday, Saturday, and Sunday are presented in Appendix A. For the 46 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:00 and 1:00 p.m., respectively. For the one dense multi-use urban site with data, the same AM and PM peak hours were observed.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alaska, Alberta (CAN), California, Colorado, Florida, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

163, 164, 168, 180, 181, 241, 245, 278, 294, 300, 301, 319, 338, 340, 342, 358, 389, 438, 502, 552, 577, 583, 584, 617, 640, 641, 704, 715, 728, 810, 866, 867, 869, 885, 886, 927, 935, 962, 977

Land Use: 937
Coffee/Donut Shop with Drive-Through Window

Description

This land use includes single-tenant coffee and donut restaurants with drive-through windows. Freshly brewed coffee and a variety of coffee-related accessories are the primary retail products sold at these sites. They may also sell other refreshment items, such as donuts, bagels, muffins, cakes, sandwiches, wraps, salads, and other hot and cold beverages. Some sites may also sell newspapers, music, CDs, and books. The coffee and donut shops contained in this land use typically hold long store hours (more than 15 hours) with an early morning opening. Also, limited indoor seating is generally provided for patrons; however, table service is not provided. Coffee/donut shop without drive-through window (Land Use 936), coffee/donut shop with drive-through window and no indoor seating (Land Use 938), bread/donut/bagel shop without drive-through window (Land Use 939), and bread/donut/bagel shop with drive-through window (Land Use 940) are related uses.

Additional Data

The sites were surveyed in the 1990s, the 2000s, and the 2010s in California, Colorado, Connecticut, Illinois, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New York, Ontario (CAN), Pennsylvania, Quebec (CAN), Tennessee, Vermont, Washington, and Wisconsin.

Specialized Land Use Data

One study provided data for a coffee/donut shop with a drive-through window that also sells donuts and ice cream (source 617). The trip generating characteristics of this site differed from the sites included in this land use; therefore, trip generation information for this site is presented here and was excluded from the data plots. The site had a gross floor area of 3,300 square feet. It generated 425 vehicle trips during the weekday AM peak hour of adjacent street traffic, and 236 vehicle trips during the weekday PM peak hour of adjacent street traffic.

Source Numbers

594, 599, 615, 617, 618, 621, 622, 635, 639, 712, 714, 725, 726, 728, 853, 854, 892, 903, 928, 959, 979, 982

Land Use: 938
Coffee/Donut Shop with Drive-Through Window and No Indoor Seating

Description

This land use includes single-tenant coffee and donut restaurants with drive-through windows. Freshly brewed coffee and a variety of coffee-related accessories are the primary retail products sold at these sites. They may also sell other refreshment items, such as donuts, bagels, muffins, cakes, sandwiches, wraps, salads, and other hot and cold beverages. Some sites may also sell newspapers, music, CDs, and books. The coffee and donut shops contained in this land use typically hold long store hours (over 15 hours) with an early morning opening. Coffee/donut shop without drive-through window (Land Use 936), coffee/donut shop with drive-through window (Land Use 937), bread/donut/bagel shop without drive-through window (Land Use 939), and bread/donut/bagel shop with drive-through window (Land Use 940) are related uses.

Additional Data

The sites were surveyed in the 1990s and the 2000s in New Hampshire, Oregon, and Washington.

Specialized Land Use Data

A 2003 study by the Oregon Department of Transportation provided trip generation information on portable coffee stands with drive-through service (source 755). The coffee stands were portable trailers with dimensions of approximately 8 feet by 12 feet and were operated by one or two employees. All sites (stands) were located near major roadways in urban areas. The sites were surveyed between 7:00 and 9:00 a.m. The trip generation characteristics of these sites differ from the facilities typically contained in this land use; therefore, trip generation information for these sites is presented here and was excluded from the data plots. The average number of vehicle trips during the weekday AM peak hour of adjacent street traffic for the nine sites was 33. The numbers of trips ranged between 16 and 56.

Source Numbers

514, 644, 755, 981

Land Use: 945
Gasoline/Service Station with Convenience Market

Description

This land use includes gasoline/service stations with convenience markets where the primary business is the fueling of motor vehicles. These service stations may also have ancillary facilities for servicing and repairing motor vehicles and may have a car wash. Some commonly sold convenience items are newspapers, coffee or other beverages, and snack items that are usually consumed in the car. The sites included in this land use category have the following two specific characteristics:

- The gross floor area of the convenience market is between 2,000 and 3,000 gross square feet
- The number of vehicle fueling positions is at least 10

Convenience market (Land Use 851), convenience market with gasoline pumps (Land Use 853), gasoline/service station (Land Use 944), truck stop (Land Use 950), and super convenience market/gas station (Land Use 960) are related uses.

Additional Data

The independent variable, vehicle fueling positions, is defined as the maximum number of vehicles that can be fueled simultaneously.

Gasoline/service stations in this land use include “pay-at-the-pump” and traditional fueling stations.

Time-of-day distribution data for this land use are presented in Appendix A. For the five general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:30 and 8:30 a.m. and 3:45 and 4:45 p.m., respectively.

A multi-variable regression analysis based on both the convenience market gross floor area (GFA) and the number of vehicle fueling positions (VFP) produced a series of fitted curve equations. The equations are in the form of:

Vehicle Trips = [(VFP Factor) x (Number of VFP)] + [(GFA Factor) x (GFA)] + (Constant)

The values for the VFP factor, GFA factor, and constant are presented in the following table for each time period for which a fitted curve equation could produce an R^2 value of at least 0.50.

Time Period	VFP Factor	GFA Factor	Constant	R^2
Weekday, AM Peak Hour of Generator	15.6	108	-295	0.62
Weekday, PM Peak Hour of Generator	Not Available			
Weekday, AM Peak Hour of Adjacent Street	15.7	97.3	-284	0.59
Weekday, PM Peak Hour of Adjacent Street	Not Available			

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CA), California, Connecticut, Florida, Indiana, Iowa, Kentucky, Minnesota, New Hampshire, New Jersey, Texas, and Wisconsin.

Source Numbers

245, 340, 350, 385, 440, 617, 813, 864, 865, 883, 888, 954, 960, 977

Land Use: 948
Automated Car Wash

Description

An automated car wash is a facility that allows for the mechanical cleaning of the exterior of vehicles. Manual cleaning services may also be available at these facilities. Self-service car wash (Land Use 947) and car wash and detail center (Land Use 949) are related uses.

Additional Data

The sites were surveyed in the 1990s and the 2000s in New Jersey, New York, and Washington.

Source Numbers

552, 555, 585, 599, 954

Land Use: 949
Car Wash and Detail Center

Description

A car wash and detail center is a facility that provides for the manual cleaning of the exterior of vehicles as well as interior car-detailing services. Self-service car wash (Land Use 947) and automated car wash (Land Use 948) are related uses.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the one general urban/suburban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:00 a.m. and 12:00 p.m. and 2:15 and 3:15 p.m., respectively.

The site was surveyed in the 2010s in Minnesota.

Source Number

866

Land Use: 960
Super Convenience Market/Gas Station

Description

This land use includes gasoline/service stations with convenience markets where there is significant business related to the sale of convenience items and the fueling of motor vehicles. Some commonly sold convenience items include newspapers, freshly brewed coffee, daily-made donuts, bakery items, hot and cold beverages, breakfast items, dairy items, fresh fruits, soups, light meals, ready-to-go and freshly made sandwiches and wraps, and ready-to-go salads. Stores typically also had automated teller machines (ATMs), and public restrooms. The sites included in this land use category have the following two specific characteristics:

- The gross floor area of the convenience market is at least 3,000 gross square feet
- The number of vehicle fueling positions is at least 10

Convenience market with gasoline pumps (Land Use 853) and gasoline/service station with convenience market (Land Use 945) are related uses.

Additional Data

To reflect changing characteristics of the convenience market component of this land use, only data from the past two decades have been included in this land use.

The independent variable, vehicle fueling positions, is defined as the maximum number of vehicles that can be fueled simultaneously. Gasoline/service stations in this land use include “pay-at-the-pump” and traditional fueling stations.

A multi-variable regression analysis based on both the convenience market gross floor area (GFA) and the number of vehicle fueling positions (VFP) produced a series of fitted curve equations. The equations are in the form of:

Vehicle Trips = [(VFP Factor) x (Number of VFP)] + [(GFA Factor) x (GFA)] + (Constant)

The values for the VFP factor, GFA factor, and constant are presented in the following table for each time period for which a fitted curve equation could produce an R^2 value of at least 0.50.

Time Period	VFP Factor	GFA Factor	Constant	R^2
Weekday, AM Peak Hour of Generator	10.3	105	-290	0.62
Weekday, PM Peak Hour of Generator	6.91	76.0	-133	0.68
Weekday, AM Peak Hour of Adjacent Street	16.1	135	-483	0.66
Weekday, PM Peak Hour of Adjacent Street	11.5	82.9	-226	0.51

The sites were surveyed in the late 1990’s, 2000s and the 2010s in Florida, Iowa, Maryland, Minnesota, New Hampshire, New Jersey, Pennsylvania, Texas, Utah, and Wisconsin.

Source Numbers

617, 813, 844, 850, 864, 865, 867, 869, 882, 888, 904, 938, 954, 960, 962

DUTCH BROTHERS TRIP GENERATION STUDIES

ATTACHMENT 5

TRAFFIC IMPACT REPORT

CFT – PHASE 2
(Panda Express-Sonic-Dutch Brothers) PROJECT
IN
THE CITY OF LATHROP, CA

December 9, 2019

Prepared for: THE CITY OF LATHROP

Prepared by: Mark D. Crane, P.E.
California Registered Traffic Engineer (#1381)
CRANE TRANSPORTATION GROUP
2621 E. Windrim Court
Elk Grove, CA 95758
(916) 647-3406
cranetransgroup@gmail.com

TABLE OF CONTENTS

I. INTRODUCTION 1

II. SUMMARY OF FINDINGS 1

A. WITHOUT PROJECT CONDITIONS 1
  1. EXISTING 1
  2. CUMULATIVE (YEAR 2022) 2
B. PROJECT IMPACTS 2
  1. TRIP GENERATION 2
  2. EXISTING + PROJECT OFF-SITE TRAFFIC IMPACTS 2
  3. CUMULATIVE (YEAR 2022) + PROJECT OFF-SITE TRAFFIC IMPACTS 3
  4. PEDESTRIAN AND TRANSIT IMPACTS 3
C. RECOMMENDATIONS 4
  1. EXISTING WITHOUT PROJECT (CITY RESPONSIBILITY) 4
  2. PROJECT (EXISTING AND CUMULATIVE) 4

III. PROJECT DESCRIPTION AND LOCATION 5

IV. SCOPE OF SERVICES (APPROVED BY CITY STAFF) 6

A. BASE ASSUMPTION 6
B. ANALYSIS LOCATIONS 6
C. TIMEPERIODS TO BE STUDIED 6
D. TRAFFIC COUNT LOCATIONS - WEEKDAY 7:00-9:00 AM & 3:00-6:00 PM .. 6
E. HORIZON YEARS & ANALYSIS SCENARIOS 7
F. CUMULATIVE (YEAR 2022) VOLUMES 7
G. PROJECT TRIP GENERATION & DISTRIBUTION 7
H. INTERSECTION EVALUATION 8
I. INTERNAL CIRCULATION 8
J. PROJECT VEHICLE DIVERSION THROUGH BURGER KING SITE 8

V. ENVIRONMENTAL SETTING 9

A. EXISTING CONDITIONS 9
  1. ROADWAYS & FREEWAYS 9
  2. EXISTING (WITHOUT PROJECT) PEAK HOUR VOLUMES 10
  3. INTERSECTION LEVEL OF SERVICE & DELAY 10
  4. EXISTING (WITHOUT PROJECT) 95TH PERCENTILE VEHICLE QUEUING 11
  5. INTERSECTION SIGNAL WARRANT EVALUATION 12
  6. TRANSIT SERVICE 13
  7. PEDESTRIAN & BICYCLE FACILITIES 14
B. CUMULATIVE (WITHOUT PROJECT) PEAK HOUR VOLUMES *15*
  1. HORIZON YEAR 15
  2. CUMULATIVE (WITHOUT PROJECT) PEAK HOUR VOLUMES 15
  3. CUMULATIVE (WITHOUT PROJECT) YEAR 2022 ROADWAY NETWORK .. 15

4. *CUMULATIVE (WITHOUT PROJECT) YEAR 2022 INTERSECTION LOS & DELAY* *15*
5. *CUMULATIVE (WITHOUT PROJECT) 95^{TH} PERCENTILE VEHICLE QUEUING AT THE W. LATHROP* *15*
6. *CUMULATIVE (WITHOUT PROJECT) SIGNAL WARRANT EVALUATION*... *16*

VI. PROJECT IMPACTS 17
A. EVALUATION CRITERIA (AS APPROVED BY THE CITY ENGINEER)..... 17
1. *SIGNALIZED OR ALL-WAY-STOP INTERSECTIONS*...... 17
2. *UNSIGNALIZED SIDE STREET STOP SIGN CONTROLLED INTERSECTIONS*...... *17*
3. *SIGNAL WARRANTS*...... *17*
4. *95TH PERCENTILE VEHICLE QUEUING (BASED UPON SYNCHRO SIMTRAFFIC SOFTWARE)* *18*
5. *PEDESTRIAN & BICYCLE RIDERS* *18*
6. *SAFETY* *18*
B. PROJECT TRIP GENERATION 18
1. *METHODOLOGY* *18*
2. *GROSS TRIP GENERATION VERSUS NET NEW AREA TRAFFIC* *19*
3. *VOLUMES*...... *19*
C. PROJECT TRIP DISTRIBUTION 20
D. EXISTING + PROJECT OFF-SITE TRAFFIC IMPACTS 20
IMPACT 1: Intersection Level of Service *20*
IMPACT 2: 95th Percentile Vehicle Queuing *20*
IMPACT 3: Intersection Signal Warrant...... *21*
E. CUMULATIVE + PROJECT OFF-SITE TRAFFIC IMPACTS 21
IMPACT 4: Intersection Level of Service *21*
IMPACT 5: 95th Percentile Vehicle Queuing *21*
IMPACT 6: Intersection Signal Warrants *21*
F. NON-TRAFFIC IMPACTS 22
IMPACT 7: Transit Impacts...... *22*
IMPACT 8: Pedestrian Impacts...... *22*
IMPACT 9: Bicycle Impacts *22*
IMPACT 10: Dutch Brothers Drive Through Window Queues...... *23*
IMPACT 11: Project Internal Circulation...... *23*

VII. RECOMMENDED IMPROVEMENTS 24

1. EXISTING WITHOUT PROJECT (City Responsibility) 24
2. PROJECT (EXISTING AND CUMULATIVE)...... 24

TABLES

1. *SIGNALIZED INTERSECTION LOS CRITERIA*
2. *UNSIGNALIZED INTERSECTION LOS CRITERIA*
3. *INTERSECTION LEVEL OF SERVICE WITH AND WITHOUT PROJECT*

4. *EXISTING 95^{TH} PERCENTILE TURN LANE QUEUING WITH & WITHOUT PROJECT*
5. *INTERSECTION SIGNAL WARRANT EVALUATION*
6. *CUMULATIVE YEAR 2022 95^{TH} PERCENTILE TURN LANE QUEUING WITH & WITHOUT PROJECT*
7. *PROJECT GROSS TRIP GENERATION*
8. *PROJECT PASSBY AND DIVERTED TRIP LINK CAPTURE*
9. *TOTAL PROJECT GROSS TRIP GENERATION*

FIGURES

1. *Area Map*
2. *Site Plan - Schematic*
3. *Site Plan - Architectural Version*
4. *Existing Intersection Approach Lane - Geometrics and Control*
5. *Existing AM Peak Hour Volumes (without Project)*
6. *Existing PM Peak Hour Volumes (without Project)*
7. *Existing (without Project) 95th% Queues Exceeding Storage*
8. *Transit Routes in Vicinity of Project Site*
9. *Existing Sidewalks and Bicycle Lanes and Those Proposed by Project*
10. *Existing AM and PM Peak Hour Pedestrian Volumes*
11. *Existing AM and PM Peak Hour Bicycle Volumes*
12. *Cumulative (Year 2022) Weekday AM Peak Hour Volumes (without Project)*
13. *Cumulative (Year 2022) Weekday PM Peak Hour Volumes (without Project)*
14. *Cumulative (Year 2022) without Project 95th% Queues Exceeding Storage*
15. *Project Traffic Increment (AM Peak Hour)*
16. *Project Traffic Increment (PM Peak Hour)*
17. *Existing + Project AM Peak Hour Volumes*
18. *Existing + Project PM Peak Hour Volumes*
19. *Cumulative (Year 2022) Weekday AM Peak Hour Volumes (with Project)*
20. *Cumulative (Year 2022) Weekday PM Peak Hour Volumes (with Project)*
21. *Existing + Project 95th% Queues Exceeding Storage*
22. *Cumulative (Year 2022) + Project 95th% Queues Exceeding Storage*
23. *Dutch Brothers Drive Thru Queueing*
24. *Existing and Cumulative (Year 2022) Recommended Improvements (without Project) City Responsibility*
25. *Existing and Cumulative (Year 2022) + Project Recommended Improvements*

APPENDICES

A. Intersection Level of Service Worksheets
B. Maximum Queue Demand Tables
C. Intersection Signal Warrant Sheet
D. Dutch Brothers Trip Rates
E. Dutch Brothers Drive Through Lane Queue Count Summaries (Stockton, Lodi & Oakley)

I. INTRODUCTION

This report has been prepared at the request of the City of Lathrop to determine the potential circulation impacts due to development of a Panda Express restaurant (with drive through window), a Sonic fast food restaurant (with drive through window) and a Dutch Brothers coffee facility (with drive through window) on adjacent parcels just south of W. Lathrop Road and between Old Harlan Road and the I-5 freeway (see **Figures 1** and **2**). Impacts have been determined for existing and year 2022 horizons (the cumulative year in the City's TMP circulation system improvement program) at West Lathrop Road intersections between the I-5 interchange and New Harlan Road as well as at Harlan Road/Old Harlan Road just south of the project area. Analysis has included level of service and delay at each intersection, vehicle queuing on critical approaches to select intersections and the possibility that some project traffic may use the Burger King-O'Reilly's Auto Parts parking lot (just east of Old Harlan Road and the project) for access to Harlan Road. In addition, each on-site circulation plan has been evaluated in the context of city code criteria and adequacy of expected drive through operation. Finally, recommendations have been made to improve all existing deficiencies or as well as all potential impacts due to the project.

II. SUMMARY OF FINDINGS

A. WITHOUT PROJECT CONDITIONS

1. EXISTING

- All analysis intersections are operating at acceptable levels of service and delay during the AM and PM peak traffic hours.
- There is unacceptable vehicle storage at the W. Lathrop Road/Harlan Road intersection for left turn queues on the eastbound W. Lathrop Road and northbound Harlan Road approaches, primarily during the PM peak traffic period. In addition, traffic on the eastbound Harlan Road approach to W. Lathrop Road frequently backs up to and through the Old Harlan Road intersection, primarily during the PM peak period.
- The unsignalized Harlan Road/Old Harlan Road intersection just south of the project site does not have AM or PM peak hour volumes meeting Caltrans peak hour signal Warrant #3 volume criteria.

2. CUMULATIVE (YEAR 2022)

- All analysis intersections would be operating at acceptable levels of service and delay during the AM and PM peak hours.
- Unacceptable vehicle queues would lengthen at the W. Lathrop Road/Harlan Road intersection for left turns on the eastbound W. Lathrop Road approach and on the northbound Harlan Road approach, primarily during the PM peak period. Eastbound W. Lathrop Road backups from Harlan Road would also increase in length intermittently to the I-5 NB Ramps intersection.
- There would only be minor queues (3 cars or less) on the northbound Old Harlan Road approach to W. Lathrop Road.
- The unsignalized Harlan Road/Old Harlan Road intersection just south of the project would not have AM or PM peak hour volumes meeting Caltrans peak hour signal Warrant #3 volume criteria.

B. PROJECT IMPACTS

1. TRIP GENERATION

All three of the proposed facilities would be expected to capture a significant amount of traffic from the adjacent I-5 Freeway as well as W. Lathrop Road, Harlan Road and Old Harlan Road. While the total two-way traffic on the three project driveways combined is projected to be about 200 vehicles during the AM commute period peak traffic hour and about 210 vehicles during the PM commute period peak traffic hour, about 140 to 150 of these trips would be captured from existing traffic flow. While customers captured from I-5 would add new traffic flow to the local street system, those captured from the adjacent or nearby surface streets would just reroute their trips to/from Old Harlan Road south of W. Lathrop Road.

2. EXISTING + PROJECT OFF-SITE TRAFFIC IMPACTS

- All analysis intersections would maintain acceptable levels of service and delay with the addition of project traffic during the AM and PM peak hours.
- Existing unacceptable queuing on the approaches to the W. Lathrop Road/Harlan Road intersection would not be increased significantly due to project traffic. However, the project would result in extremely long 95th percentile queues on the NB Old Harlan Road approach to W. Lathrop Road (up to 200 feet - or 8 vehicles) during the PM peak traffic hour. This backup would result in some drivers cutting through both the Chevron Gas station and

Burger King-O'Reilly's Auto Parts properties in order to find alternate routes to bypass the congestion.

- Internal circulation for both the Panda Express and Sonic restaurants meets City code criteria and should operate acceptably.
- The Dutch Brothers drive through lane(s) should have acceptable storage to accommodate anticipated queues based upon survey results at 3 other Dutch Brothers facilities in the region (Stockton, Lodi and Oakley). The only potential issue of conflict will be due to the Dutch Brothers drive through lane entrance being much closer to the Sonic driveway connection to Old Harlan Road than to the Dutch Brothers driveway connection. It is likely that the Sonic driveway will accommodate a third or more of the inbound Dutch Brothers traffic.

3. CUMULATIVE (YEAR 2022) + PROJECT OFF-SITE TRAFFIC IMPACTS

- There will be no new impacts due to project traffic in 2022 compared to existing conditions.
- All intersections will continue to operate acceptably with the addition of project traffic during the AM and PM peak hours.
- There will be no significant extensions of queuing on intersection approaches already experiencing unacceptable queuing. The lengthy 95th percentile queue on the NB Old Harlan Road approach to W. Lathrop Road will extend back to 425 feet, further encouraging some drivers in the queue to use the Chevron and Burger King-O'Reilly's Auto properties as alternative travel routes.

4. PEDESTRIAN AND TRANSIT IMPACTS

- The three project facilities will likely attract some customers from the local neighborhood, some pedestrians (many high school students) now walking on the sidewalk on the north side of W. Lathrop Road, and some employees using the two regional transit routes that have stops at the W. Lathrop Road/Harlan Road intersection. However, while a sidewalk will be provided along the project's Old Harlan Road frontage, none will be provided on the south side of W. Lathrop Road east or west of Old Harlan Road. This will force pedestrians to walk in the street or through the Chevron and Burger King properties to access the three facilities. Also, it is likely that pedestrians on the north side of W. Lathrop Road will cross the street at a variety of locations (none with crosswalks) to access the facilities.

C. RECOMMENDATIONS

1. EXISTING WITHOUT PROJECT (CITY RESPONSIBILITY)

- Reconfigure the northbound Harlan Road approach to W. Lathrop Road to provide two exclusive left turn lanes and a combined through/right turn lane.
- Remove the raised island median on Harlan road south of W. Lathrop Road at the entrance to the existing northbound left turn lane. Continue this existing turn lane south to the Burger King-O'Reilly's driveway.
- Extend the length of the left turn lane on the eastbound W. Lathrop Road approach to Harlan Road by at least 75 feet.
- Retime the W. Lathrop Road/Harlan Road signal and coordinate timing with the W. Lathrop Road/Cambridge Drive signal.

2. PROJECT (EXISTING AND CUMULATIVE)

- Realign the Old Harlan Road connection to Harlan Road (just south of the project) about 100 feet to the north and provide two lanes on the Old Harlan Road approach: one for left turns and one for right turns. In conjunction with this measure, restripe the median of Harlan Road just south of the new intersection to provide defined back-to-back left turn lanes - one for northbound left turns into Old Harlan Road, and one for southbound left turns into the driveway providing access into the Lathrop Crossing shopping center on the east side of Harlan Road.
- Provide signs adjacent to the exit lanes at each of the three project driveways showing an arrow pointing to the right and a message stating I-5 access turn right. In conjunction with this measure, also provide a sign on the southbound Old Harlan Road approach to Harlan Road with an arrow pointing left and a message stating I-5 access turn left.
- Provide sidewalks on the south side of W. Lathrop Road extending east and west of Old Harlan Road (from the I-5 Ramps intersection to the Chevron driveway).
- Provide a crosswalk at the W. Lathrop Road/I-5 NB Ramps intersection crossing W. Lathrop Road just east of the intersection. Provide pedestrian walk/don't walk signals in conjunction with the crosswalk.
- In order to ensure that Dutch Brothers customers do not congest the Sonic driveway during peak activity times, it may be necessary for Dutch Brothers to provide moveable orange cones across the internal Dutch Brothers-Sonic parking lots connection.

- Based upon input from Chevron, Burger King or O'Reilly's Auto, if there is a perceived use of either property by cut-through traffic from the project:
    a. The City shall conduct an independent survey to see the extent of the issue.
    b. If there is a problem, the City shall work with one or both property owners to develop measures to further reduce or eliminate cut-through traffic.
    c. This survey shall be funded by the project applicant

III. PROJECT DESCRIPTION AND LOCATION

The proposed project is comprised of two restaurants with drive through lanes and a coffee service facility with a drive through lane and limited inside seating and service. Facilities are (listed north to south):

- Panda Express (2200 square feet) with a drive through lane
- Sonic drive in (1608 square feet) with a drive through lane
- Dutch Brothers coffee service (862 square feet) with a drive through lane

Locations are schematically shown on **Figure 2**, while the site plan is presented in **Figure 3**. Each facility will have single driveway connection to the west side of Old Harlan Road and there will also be single internal driveway connections between Panda Express and Sonic and between Sonic and Dutch Brothers. There are no changes proposed to the local circulation system by this project.

IV. SCOPE OF SERVICES (Approved by City staff)

A. BASE ASSUMPTION

All three developments (Panda Express, Sonic & Dutch Brothers) are considered as one project for off site evaluation purposes.

B. ANALYSIS LOCATIONS

Intersection Level of Service & Queuing

- W. Lathrop Road/I-5 Southbound Ramps
- W. Lathrop Road/I-5 Northbound Ramps
- W. Lathrop Road/Old Harlan Road
- W. Lathrop Road/New Harlan Road
- Old Harlan Road/New Harlan Road

C. TIME PERIODS TO BE STUDIED

- Weekday AM and PM commute peak traffic hours

D. TRAFFIC COUNT LOCATIONS – WEEKDAY 7:00-9:00 AM & 3:00-6:00 PM (ALL VEHICLES, TRUCKS, PEDS, BIKES).

Counts will be conducted when all schools are open.

- W. Lathrop Road/I-5 Southbound Ramps
- W. Lathrop Road/I-5 Northbound Ramps
- W. Lathrop Road/Old Harlan Road
- W. Lathrop Road/New Harlan Road
- Old Harlan Road/New Harlan Road
- Old Harlan Road/Driveways serving Burger King & Chevron gas station
- W. Lathrop Road/Chevron gas station driveway
- New Harlan Road/Burger King driveway
- Drive-thru lanes at three Dutch Brothers operations (Lodi, Stockton, Oakley) - trip generation and queuing, two days each

Counts will include observations of vehicle queuing on the northbound Old and New Harlan Road approaches to W. Lathrop Road, the eastbound W. Lathrop Road approach to New Harlan

Road and the W. Lathrop Road westbound left turn lane approach to the I-5 Southbound On Ramp.

E. HORIZON YEARS & ANALYSIS SCENARIOS

- Existing
- Existing + Project
- Year 2022
- Year 2022 + Project

F. CUMULATIVE (YEAR 2022) VOLUMES

Year 2022 AM & PM peak hour volumes will be obtained from the 2019 TMP study for the following locations.

- W. Lathrop Road/I-5 Southbound Ramps
- W. Lathrop Road/I-5 Northbound Ramps
- W. Lathrop Road/New Harlan Road

Year 2022 projections at all other analysis locations will be developed based upon existing volume interrelationships. In addition, a determination will be made how much development on the project site was included in the 2022 TMP projections. Adjustments will be made to provide true 2022 Without Project and 2022 + Project projections.

G. PROJECT TRIP GENERATION & DISTRIBUTION

Project trip generation for the Panda Express & Sonic drive-in will be based upon trip rates from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, by the Institute of Transportation Engineers, 2017, while trip generation for the Dutch Brothers operation will be based upon three surveys of AM & PM peak period trip generation and order line queuing conducted by Crane Transportation Group. Dutch Brothers surveys will be conducted for two days each at facilities in Stockton, Lodi and Oakley. The percentage of passby and diverted link capture of existing traffic associated with the three Lathrop restaurants will be discussed with and approved by City staff.

Project traffic will be distributed based upon local traffic flow patterns, in particular to/from the Burger King restaurant's driveways along New & Old Harlan Road.

H. INTERSECTION EVALUATION

Signalized

- Level of service and 95th percentile queuing using Synchro-SIM traffic analysis software program. Queuing projections for 2022 and "with project" conditions will be based upon the calibrated relationship of surveyed 95th percentile queuing at analysis intersections compared to Synchro theoretical projections.

Unsignalized

- Level of Service – stop sign controlled approach
- Peak hour signal warrant (Caltrans volume Warrant #3)

I. INTERNAL CIRCULATION

Internal circulation plans for each of the three developments will be reviewed in the context of City Code criteria and good traffic engineering practice. Of particular concern will be vehicle queuing on the approach to the drive-thru lane at Dutch Brothers Coffee. Surveys at the Stockton, Lodi and Oakley Dutch Brothers operations will tabulate order line queuing for the 7:00-9:00 AM and 3:00-6:00 PM hours for the two survey days at each location.

J. PROJECT VEHICLE DIVERSION THROUGH BURGER KING SITE

Concern has been raised by the Burger King restaurant on the east side of Old Harlan Road about project traffic passing through their site to access New Harlan Road, particularly if there is extensive queuing on the northbound Old Harlan Road approach to W. Lathrop Road. This potential impact will be evaluated.

V. ENVIRONMENTAL SETTING

A. EXISTING CONDITIONS

1. ROADWAYS & FREEWAYS

Interstate 5 (I-5) is a six-lane freeway located just west of the project site. It extends northerly to Stockton, Sacramento and to the Oregon border; and southerly to a connection with I-205 (the most direct freeway connection to the San Francisco Bay Area) as well as Los Angeles and other southern California cities. I-5 has a tight diamond interchange with Louise Avenue, with both ramp intersections being signal controlled.

West Lathrop Road is a four-lane arterial street in the project area. The posted speed limit is 35 miles per hour. It extends easterly into the City of Manteca and an interchange with the SR 99 freeway and westerly to an interchange with the I-5 freeway (just west of the project site).

W. Lathrop Road changes name to Spartan Way just west of I-5. In the project area there are signalized intersections with the I-5 North and South bound ramps, Harlan Road and Cambridge Drive. Old Harlan Road intersects the north and south sides of W. Lathrop Road about halfway between the I-5 Northbound ramps and Harlan Road signalized intersections. A raised median along W. Lathrop Road in this area limits movements to right turns in/out only between W. Lathrop Road and Old Harlan Road.

Harlan Road is a 2- to 4-lane arterial running along the east side of the I-5 freeway. The posted speed limit is 40 miles per hour. Just south of W. Lathrop Road there are two northbound lanes and two southbound lanes that merge to a single lane north of Old Harlan Road. There is also a median continuous two-way left turn lane.

Old Harlan Road is a two-lane street extending one block between W. Lathrop Road and Harlan Road (both north and south of W. Lathrop Road). There is no posted speed limit. The section south of W. Lathrop Road adjacent to the project site is stop sign controlled on its northbound approach to W. Lathrop Road (where right turns only to/from W. Lathrop Road are allowed) and on its southbound approach to Harlan Road (where all turn movements are allowed except left turns from Old Harlan Road to northbound Harlan Road).

Figure 4 presents existing intersection geometrics and control at all analysis locales.

2. EXISTING (WITHOUT PROJECT) PEAK HOUR VOLUMES

Weekday AM and PM commute period (7:00-9:00 AM and 3:00-6:00 PM) traffic counts were conducted at all analysis intersections on Thursday, October 3, 2019. It was determined that the specific peak hours at the vast majority of intersections were between 7:00 and 8:00 AM and between 5:00 and 6:00 PM. Resultant AM and PM peak hour volumes are presented in **Figures 5** and **6.**

3. INTERSECTION LEVEL OF SERVICE & DELAY

a. Analysis Methodology

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the Year 2017 6th Edition *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the Year 2017 6th Edition *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay reported for the stop sign controlled approaches or turn movements. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

b. Minimum Acceptable Operation – City of Lathrop

Signalized & All Way Stop Intersections: Level of Service D is the poorest acceptable overall intersection operation.

Unsignalized Intersections (side street stop sign controlled): Level of Service E is the poorest acceptable side street stop sign controlled approach operation.

c. Existing Without Project Intersection Level of Service Operation

Table 3 shows that all analysis intersections are currently operating at acceptable levels of service during the weekday AM and PM commute peak hours. The W. Lathrop Road/Harlan Road signalized intersection has a LOS C operation during both the AM and PM peak hours. At the I-5 interchange the W. Lathrop Road/Southbound Ramps intersection is also operating acceptably at LOS C during both peak hours, while the W. Lathrop Road/I-5 Northbound Ramps intersection is operating at an acceptable LOS C during the AM peak hour and LOS B during the PM peak hour. At the unsignalized Harlan Road/Old Harlan Road intersection south of the site, the stop sign controlled Old Harlan Road approach is operating at an acceptable LOS B during both peak hours. Intersection level of service worksheets are presented in **Appendix A**.

4. EXISTING (WITHOUT PROJECT) 95TH PERCENTILE VEHICLE QUEUING

a. Analysis Methodology

Field surveys were conducted during AM and PM peak periods (under direction of Crane Transportation Group) of maximum queues every signal cycle at the following locations:

- W. Lathrop Road/Harlan Road
  - W. Lathrop Road
    - Eastbound left turn
    - Eastbound through and right turn movements
  - Harlan Road
    - Northbound left turn
    - Northbound through and right turn movements
- W. Lathrop Road/Old Harlan Road
  - Old Harlan Road stop sign controlled northbound right turn
- W. Lathrop Road/I-5 Southbound Ramps
  - W. Lathrop Road westbound left turn (to Southbound On Ramp)

Maximum queues for each 15-minute time period are presented in **Appendix B**.

b. Queuing Results

Acceptable Queuing

As shown, maximum queues were always well within available storage in the left turn lane on the westbound W. Lathrop Road approach to the I-5 Southbound On Ramp. Also, queues on the northbound Old Harlan Road approach to W. Lathrop Road were limited, ranging from 1 to 2 vehicles during any 15-minute period.

Unacceptable Queuing

Table 4 shows that at the W. Lathrop Road/Harlan Road intersection the left turn lane on the northbound Harlan Road approach to W. Lathrop Road had a maximum queue demand exceeding the available 235 foot left turn lane storage length during all 15-minute periods from 3:00 to 6:00 PM, and all but one 15-minute period from 7:00 to 9:00 AM. On the eastbound W. Lathrop Road approach to Harlan Road the maximum queue demand for the 320 foot left turn lane exceeded or met available storage for all but two 15-minute time periods between 3:00 and 6:00 PM, while there was only one 15-minute period from 7:00 to 9:00 PM where demand met or exceeded storage. The W. Lathrop Road through and through/right turn lane queues on the eastbound approach to Harlan Road backed up to and through the Old Harlan Road intersection about half the time during the 3:00 to 6:00 PM period, but not at all from 7:00 to 9:00 AM. (See **Figure** 7) It should be noted that the "Maximum" queues described above were usually longer than the "95th percentile" queues used for evaluation purposes.

5. INTERSECTION SIGNAL WARRANT EVALUATION

a. Analysis Methodology

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 10 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2012, and the *Manual on Unified Traffic Control Devices* Federal Highway Administration, 2003 California Supplement (2014) Revision 3, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual*. Section 4C of the MUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the MUTCD, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a logarithmic curve and takes only the hour with the highest volume of the day into account. Please see **Appendix C** for the warrant chart.

b. Existing Warrant Evaluation

- **Table 5** shows that existing AM and PM peak hour volumes at the unsignalized Harlan Road/Old Harlan Road intersection do not meet Caltrans Signal Warrant #3 volume criteria levels.

6. TRANSIT SERVICE

There are two San Joaquin Regional Transit Routes serving the project area:
Route 90 running along W. Lathrop Road and Route 97 running along Harlan Road.
(See **Figure 8**.) Each route is briefly detailed below.

Route 90 – Runs between Stockton and Tracy
Monday to Friday
Bus stops - Eastbound: east of Harlan Road at Cambridge Drive
- Westbound: just west of Harlan Road

Route 97 – Runs between Stockton and Tracy
Monday to Friday
Bus stops - Northbound: just north of W. Lathrop Road
- Southbound: just south of W. Lathrop Road

There are sidewalks at each transit stop, but no shelters. Also, there is no existing sidewalk system in place along the south side of W. Lathrop Road connecting the bus stops to Old Harlan Road.

7. PEDESTRIAN & BICYCLE FACILITIES

a. Pedestrian

Sidewalks are in place in the project area along the following streets (see **Figure 9**):

- Old Harlan Road west side – adjacent to the project site
- Old Harlan Road east side – adjacent to the Burger King – O'Reilly Auto Property
- Harlan Road (south of W. Lathrop Road) west side - adjacent to the Burger King – O'Reilly Auto Property north to W. Lathrop Road
- Harlan Road (south of W. Lathrop Road) east side – continuous
- W. Lathrop Road north side – continuous from Harlan Road west through the I-5 interchange to Lathrop High School
- W. Lathrop Road south side – from Harlan Road west to the Chevron gas station driveway

Figure 10 shows that the largest number of pedestrians in the project area during both the AM and PM peak hours was along the north side of W. Lathrop Road: up to 20 pedestrians walking westbound during the AM commute peak hour and 16 pedestrians (some westbound and some eastbound) during the PM commute peak hour. There were only 3 pedestrians along the south side of the street - during the PM peak hour. Along Old Harlan Road there were no pedestrians during the AM peak hour and only 2 during the PM peak hour.

b. Bicycles

There are Class II striped and signed bicycle lanes along both sides of Harlan Road just north and south of W. Lathrop Road. The southbound bicycle lane along the west side of the street ends several hundred feet south of W. Lathrop Road. There are no bicycle lanes along either W. Lathrop Road or Old Harlan Road (see **Figure 9**).

Figure 11 shows that along W. Lathrop Road at Old Harlan Road the number of bike riders was 8 during the AM peak hour and 2 during the PM peak hour, while along Harlan Road at Old Harlan Road the number of bike riders was 0 during the AM peak hour and 5 during the PM peak hour. There were no bike riders along Old Harlan Road during the AM peak hour and 5 during the PM peak hour.

B. CUMULATIVE (WITHOUT PROJECT) CONDITIONS

1. HORIZON YEAR

The cumulative horizon year for project analysis in this study as directed by City staff was 2022.

2. CUMULATIVE (WITHOUT PROJECT) PEAK HOUR VOLUMES

The source of cumulative weekday AM and PM peak hour (without project) volumes was the 2018 TMP study for the City of Lathrop by Crane Transportation Group, which developed volume projections for the years 2020 and 2022. At City direction year 2022 projections were used as the cumulative horizon for this study. **Figures 12** and **13** present resultant cumulative (without project) weekday AM and PM peak hour volumes.

3. CUMULATIVE (WITHOUT PROJECT) YEAR 2022 ROADWAY NETWORK

No circulation system improvements are programmed in the project area by 2022*

4. CUMULATIVE (WITHOUT PROJECT) YEAR 2022 INTERSECTION LEVEL OF SERVICE & DELAY

Table 3 shows that by 2022 all analysis intersections will be operating at acceptable levels of service during both the AM and PM peak traffic hours. The W. Lathrop Road/Harlan Road and W. Lathrop Road/I-5 Northbound Ramps signalized intersections will be operating at an acceptable LOS C during both peak hours, while the I-5 Southbound Ramps signalized intersection will be operating at an acceptable LOS D during the AM peak hour and LOS C during the PM peak hour. At the unsignalized Harlan Road/Old Harlan Road intersection the Old Harlan Road stop sign controlled approach will be operating at an acceptable LOS B during both peak hours.

5. CUMULATIVE (WITHOUT PROJECT) 95TH PERCENTILE VEHICLE QUEUING AT THE W. LATHROP ROAD/I-5 INTERCHANGE

Table 6 shows that by 2022, 95th percentile unacceptable queuing at the W. Lathrop Road/Harlan Road intersection in the eastbound approach and northbound approach left turn

---

**Mr. Glenn Gebhardt – City Engineer, October 2019.*

lanes will be further lengthened. In addition, the frequency of the eastbound W. Lathrop Road through and through/right turn lanes backing up to and past Old Harlan Road will be increased during the PM peak hour. Along W. Lathrop Road at the I-5 interchange the 95th percentile queuing in the left turn lane on the westbound approach to the southbound on ramp should be within available storage during both commute peak hours. Also, 95th percentile queues on the northbound Old Harlan Road approach to W. Lathrop Road will increase by 1 vehicle during both peak hours (up to 2 vehicles during the AM peak hour and 3 vehicles during the PM peak hour). See **Figure 14.**

6. CUMULATIVE (WITHOUT PROJECT) SIGNAL WARRANT EVALUATION

Table 5 shows that the unsignalized Harlan Road/Old Harlan Road intersection will not have AM or PM peak hour volumes meeting Caltrans Peak Hour Warrant #3 volume criteria levels by 2022.

VI. PROJECT IMPACTS

A. EVALUATION CRITERIA (as approved by the City Engineer)

The addition of project traffic would result in unacceptable operation if:

1. **SIGNALIZED OR ALL-WAY-STOP INTERSECTIONS**
   - Without Project acceptable LOS A, B, C or D operation is degraded to LOS E or F.

     or
   - Without Project unacceptable LOS E or F operation has vehicle control delay increased by 5 seconds or greater.

2. **UNSIGNALIZED SIDE STREET STOP SIGN CONTROLLED INTERSECTIONS**
   - Without Project acceptable LOS A, B, C, D or E operation of the stop sign controlled intersection approach is degraded to LOS F operation and the intersection meets peak hour signal Warrant #3 volume criteria levels (with the project).

     or
   - Without Project unacceptable LOS F operation of the stop sign controlled approach has vehicle control delay increased by 5 seconds or greater and the intersection meets peak hour signal Warrant #3 volume criteria levels (with the project).

3. **SIGNAL WARRANTS**
   - Without Project volumes at an unsignalized intersection do not meet Caltrans peak hour Warrant #3 volume criteria and the addition of project traffic increases volumes to meet Warrant #3 volume criteria levels.

     or
   - Without Project volumes at an unsignalized intersection already meet Caltrans peak hour Warrant #3 volume criteria and the addition of project traffic increases total volumes passing through the intersection by 2 percent or greater.

     or
   - Without Project peak hour 95th percentile queuing in the lane approaching a stop sign controlled intersection will be increased by 100 feet or more and will likely result in traffic diversion to alternate routes.

4. 95TH PERCENTILE VEHICLE QUEUING (BASED UPON SYNCHRO SIMTRAFFIC SOFTWARE)

- Without Project peak hour 95th percentile queuing in the lanes approaching a signalized intersection is less than available storage and the addition of project traffic increases the 95th percentile queue to exceed available storage in one or more of the approach lanes.

  or

- Without Project peak hour 95th percentile queuing in one or more of the lanes approaching a signalized intersection is already greater than available storage and the addition of project traffic to the entire intersection increases the 95th percentile queuing in any of the lanes operating unacceptably by greater than 20 feet.

5. PEDESTRIAN & BICYCLE RIDERS

- The addition of project traffic will result in significant safety impacts to local pedestrian and/or bicycle circulation, or will not provide acceptable on- or off-site pedestrian or bicycle facilities for employees or customers.

6. SAFETY

- If, in the opinion of the registered traffic engineer conducting the study, the addition of project traffic or a design feature of the project will result in a significant circulation system safety impact.

B. PROJECT TRIP GENERATION

1. METHODOLOGY

Trip generation projections were developed individually for the three restaurant facilities. Trip rates for the Panda Express and Sonic restaurants with drive through windows were obtained from the traffic engineering professions standard source of trip rate data, Trip Generation Manual 10th Edition by the Institute of Transportation Engineers (ITE), 2017. Trip rates for Dutch Brothers were obtained based upon trip generation surveys at three existing Dutch Brothers operations in the region: Stockton, Lodi and Oakley. Dutch Brothers trip rate survey results were tabulated and then compared to ITE trip rates for coffee/donut shops with drive through windows (with and without indoor seating). Please see **Appendix D** for a comparison of trip rates. After review of the findings it was determined in consultation with City staff that the trip rates from the Stockton facility would provide a conservative projection of the trips expected from the proposed Lathrop facility. It should be noted that the Panda Express restaurant will not be open during the 7-8 AM commute peak traffic hour.

2. GROSS TRIP GENERATION VERSUS NET NEW AREA TRAFFIC

Table 7 presents the gross AM and PM peak hour trip generation that would be expected from the Panda Express, Sonic and Dutch Brothers operations. These projections reflect the traffic expected on each facility's driveway. However, they do not reflect existing traffic that each restaurant will attract from the I-5 freeway or from the ambient traffic already traveling along W. Lathrop Road, Harlan Road and Old Harlan Road (passby or diverted link trip capture).

Table 8 presents the percentage of traffic each operation would be expected to capture from the I-5 freeway versus the local streets. Results were worked out in consultation with City staff. As shown, freeway capture was projected to range from 45% for Dutch Brothers down to 25% for Panda Express, while local street system capture was projected to be 30 to 35% for all three operations. Resultant net new local area traffic then ranged from 20% for Dutch Brothers up to 45% for Panda Express.

3. VOLUMES

Table 9 presents the sum of gross, captured and net new area traffic from the three restaurants. Results are summarized as follows.

Project Trip Generation Scenario	TWO WAY TRIPS	
	AM PEAK HOUR	PM PEAK HOUR
Gross Trip Generation	201	210
Trips Captured from I-5 freeway or nearby streets	152	142
Net new trips attracted from remainder of Lathrop or north Manteca	49	68

C. PROJECT TRIP DISTRIBUTION

AM and PM peak hour traffic from each of the three facilities was distributed to the local roadway network as shown in **Appendix D,** while the total project peak hour traffic increments are presented in **Figures 15** and **16** for AM and PM peak hour conditions, respectively. Net new traffic was distributed primarily to/from nearby residential areas, while diverted link trip capture from Harlan Road and W. Lathrop Road favored vehicle flow with ease of access to Old Harlan Road adjacent to the site. Passby capture was just from Old Harlan Road. Distribution of all outbound traffic back to the I-5 freeway or to west of I-5 was assumed via northbound Old Harlan Road to W. Lathrop Road – right turn to the eastbound W. Lathrop Road left turn lane at Harlan Road and then a U turn to westbound W. Lathrop Road. This would be the most direct route back to the I-5 interchange and for evaluation purposes would result in the most potentially significant operational impacts.

Figures 17 and **18** present resultant Existing + Project AM and PM peak hour volumes, while **Figures 19** and **20** present resultant year 2022 AM and PM peak hour volumes.

D. EXISTING + PROJECT OFF-SITE TRAFFIC IMPACTS

IMPACT 1: Intersection Level of Service

Table 3 shows that all analysis intersections would maintain acceptable AM and PM peak hour levels of service with the addition of project traffic. ***No improvements required.***

IMPACT 2: 95th Percentile Vehicle Queuing

Table 4 shows that the addition of project traffic would result in one queuing impact (see **Figure 21**):

- The PM peak hour 95th percentile queue on the northbound Old Harlan Road approach to W. Lathrop Road would be increased by more than 100 feet (up to 120 feet - or 5 vehicles). Minor diversion of some backed up drivers through the Chevron or Burger King-O'Reilly Auto parcels could be possible. ***Improvements recommended.***

IMPACT 3: Intersection Signal Warrant

Table 5 shows that the addition of project traffic to the Harlan Road/Old Harlan Road intersection would not increase AM or PM peak hour volumes to meet or exceed Caltrans Peak Hour Warrant #3 volume criteria levels. ***No improvements required.***

E. CUMULATIVE + PROJECT OFF-SITE TRAFFIC IMPACTS

IMPACT 4: Intersection Level of Service

Table 3 shows that all analysis intersections would maintain acceptable AM and PM peak hour levels of service with the addition of project traffic. ***No improvements required.***

IMPACT 5: 95th Percentile Vehicle Queuing

Table 6 shows that the addition of project traffic would result in one queuing impact (see **Figure 22**):

- The PM peak hour 95th percentile queue on the northbound Old Harlan Road approach to W. Lathrop Road would be increased by more than 100 feet (360 feet - or 18 vehicles). Major diversion of backed up drivers through the Chevron and Burger King-O'Reilly's Auto parcels would be expected. In addition, some project drivers would travel south on Old Harlan Road and make an illegal left turn to proceed north on Harlan Road to the W. Lathrop Road intersection. ***Improvements recommended.***

IMPACT 6: Intersection Signal Warrants

Table 5 shows that the addition of project traffic to the Harlan Road/Old Harlan Road intersection would not increase AM or PM peak hour volumes to meet or exceed Caltrans Peak Hour Warrant #3 volume criteria levels. ***No improvements required.***

F. NON-TRAFFIC IMPACTS

IMPACT 7: Transit Impacts

Transit stops for San Joaquin Regional Transit Routes 90 and 97 are located in close proximity to the W. Lathrop Road/Harlan Road intersection. However, while there will be a sidewalk along the project's Old Harlan Road frontage there is no sidewalk extending to the east along the south side of W. Lathrop Road along the Chevron gas station frontage to Old Harlan Road, or a crosswalk across the south leg of Old Harlan Road at its connection to W. Lathrop Road. Therefore, all project transit users would be required to cross Old Harlan Road at a variety of locations and walk through either the Chevron service area or the Burger King parking lot as part of their trip between the project facilities and any of the bus stops. ***Improvements recommended.***

IMPACT 8: Pedestrian Impacts

A sidewalk will be provided along the project's Old Harlan Road frontage. However, no sidewalk is being provided along the project's W. Lathrop Road frontage. Based upon discussion with City staff it is likely that Lathrop High School students walking along the north side of W. Lathrop Road (where a sidewalk is provided) will patronize one or more of the project facilities, particularly Dutch Brothers and Sonic. Since a crosswalk of W. Lathrop Road nearest the project is at the Harlan Road signal, it is likely that some students will cross W. Lathrop Road at the I-5 Northbound Ramps signalized intersection to the west (where there is no crosswalk) or at Old Harlan Road, where there is also no crosswalk, but a raised median. Crossings at both locations without crosswalks presents safety issues. Also, if a crosswalk is provided at the I-5 Northbound Ramps intersection there will be no sidewalk along the south side of W. Lathrop Road between the Northbound Ramps intersection and Old Harlan Road. In addition, the lack of a sidewalk on the south side of W. Lathrop Road just east of Old Harlan Road (see Transit Impacts above) will force all residents of the neighborhood east of Harlan Road who want to walk to any of the project facilities to use the Chevron service area or Burger King parking lot as travel routes. ***Improvements recommended.***

IMPACT 9: Bicycle Impacts

Bicycle racks will be provided at each of the three facilities (based upon City code criteria requirements). Bike riders will have access to the partial set of Class II bicycle lanes along Harlan Road via Old Harlan Road (or via the Burger King parking lot). ***No improvements required.***

IMPACT 10: Dutch Brothers Drive Through Window Queues

Surveys were conducted from 7:00-9:00 AM and 3:00-6:00 PM at three Dutch Brothers operations of drive through window queue lengths. Surveys were conducted for two days each at locations in Stockton, Lodi and Oakley. **Appendix E** presents detailed survey results. Maximum queues at all three locations never exceeded 13 vehicles from 7:00-9:00 AM, nor 10 vehicles from 3:00-6:00 PM. Based upon the Dutch Brothers site plan for Lathrop (see **Figure 23**), they will have room for 16 vehicles to queue in their drive through lanes. Therefore, proposed storage should be acceptable. The only minor issue with the Dutch Brothers drive through lanes entrance is that it is much closer to the Sonic driveway along Old Harlan Road than to the Dutch Brothers driveway. It is likely that at least a third of Dutch Brothers customers will use the Sonic driveway for inbound access. There could be intermittent periods from 7:00-9:00 AM when minor congestion could result at the Sonic-Dutch Brothers internal parking lot connection. ***Improvements recommended.***

IMPACT 11: Project Internal Circulation

Circulation flow through all three properties meets City code criteria and appears acceptable, with the one exception listed in IMPACT 10 regarding use if the Sonic driveway by many inbound customers to Dutch Brothers. ***No additional improvements required.***

VII. RECOMMENDED IMPROVEMENTS

1. EXISTING WITHOUT PROJECT (City Responsibility) - See **Figure 24**

- Reconfigure the northbound Harlan Road approach to W. Lathrop Road to provide two exclusive left turn lanes and a combined through/right turn lane.
- Remove the raised island median on Harlan road south of W. Lathrop Road at the entrance to the existing northbound left turn lane. Continue this existing turn lane south to the Burger King-O'Reilly's driveway.
- Extend the length of the left turn lane on the eastbound W. Lathrop Road approach to Harlan Road by at least 75 feet.
- Retime the W. Lathrop Road/Harlan Road signal and coordinate timing with the W. Lathrop Road/Cambridge signal.

2. PROJECT (EXISTING AND CUMULATIVE) - See **Figure 25**

- Realign the Old Harlan Road connection to Harlan Road (just south of the project) about 100 feet to the north and provide two lanes on the Old Harlan Road approach: one for left turns and one for right turns. In conjunction with this measure, restripe the median of Harlan Road just south of the new intersection to provide defined back-to-back left turn lanes - one for northbound left turns into Old Harlan Road, and one for southbound left turns into the driveway providing access into the Lathrop Crossing shopping center on the east side of Harlan Road.
- Provide signs adjacent to the exit lanes at each of the three project driveways showing an arrow pointing to the right and a message stating I-5 access turn right. In conjunction with this measure, also provide a sign on the southbound Old Harlan Road approach to Harlan Road with an arrow pointing left and a message stating I-5 access turn left.
- Provide sidewalks on the south side of W. Lathrop Road extending east and west of Old Harlan Road (from the I-5 Ramps intersection to the Chevron driveway).
- Provide a crosswalk at the W. Lathrop Road/I-5 NB Ramps intersection crossing W. Lathrop Road just east of the intersection. Provide pedestrian walk/don't walk signals in conjunction with the crosswalk.
- In order to ensure that Dutch Brothers customers do not congest the Sonic driveway during peak activity times, it may be necessary for Dutch Brothers to provide moveable orange cones across the internal Dutch Brothers-Sonic parking lots connection.

- Based upon input from Chevron, Burger King or O'Reilly's Auto if there is a perceived use of either property by cut-through traffic from the project:
    a. The City shall conduct an independent survey to see the extent of the issue.
    b. If there is a problem, the City shall work with one or both property owners to develop measures to further reduce or eliminate cut-through traffic.
    c. This survey shall be funded by the project applicant.

Tables

TABLE 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board).

TABLE 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	DESCRIPTION	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.0 to 15.0
C	Average traffic delays	15.0 to 25.0
D	Long traffic delays	25.0 to 35.0
E	Very long traffic delays	35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board).

TABLE 3

INTERSECTION LEVEL OF SERVICE
WITH AND WITHOUT PROJECT

EXISTING (YEAR 2019)

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
W. LATHROP RD/SB I-5 RAMPS	C-34.3 (1)	D-37.3	C-32.3	C-32.8
W. LATHROP RD/NB I-5 RAMPS	C-25.7 (1)	C-28.0	B-16.2	B-18.8
W. LATHROP RD/HARLAN RD	C-23.3 (1)	C-23.6	C-25.5	C-26.1
HARLAN RD/OLD HARLAN RD	B-10.0 (2)	B-10.3	B-11.3	B-11.6

CUMULATIVE (YEAR 2022)

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
W. LATHROP RD/SB I-5 RAMPS	D-38.9 (1)	D-41.3	C-34.4	D-37.3
W. LATHROP RD/NB I-5 RAMPS	C-30.7 (1)	C-33.4	C-31.8	C-34.7
W. LATHROP RD/HARLAN RD	C-25.2 (1)	C-25.5	C-29.3	C-30.3
HARLAN RD/OLD HARLAN RD	B-10.3 (2)	B-10.5	B-11.9	B-12.3

Signalized level of service – control delay in seconds.
Side street stop sign control - NB right turn level of service/delay in seconds.

- Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board) Methodology
- Synchro Level of Service software

Source: Crane Transportation Group

TABLE 4

EXISTING 95TH PERCENTILE TURN LANE QUEUING* WITH & WITHOUT PROJECT

LOCATION	QUEUE (in Feet)			
	AM PEAK HOUR		PM PEAK HOUR	
	W/O PROJECT (Field Surveyed)	WITH PROJECT	W/O PROJECT (Field Surveyed)	WITH PROJECT
W. LATHROP RD/HARLAN RD				
EBL	260 (320)(1)	280	340 (320)(1)	360
EBT	160 (330-530)(2)	180	480 (330-530)(2)	500
NBL	320 (235)(1)	320	340 (235)(1)	340
NBT	160	160	200	200
W.LATHROP/OLD HARLAN RD	20	60	40	160**
NBR				
W.LATHROP RD/I-5 SB RAMPS	180 (420)(1)	200	240 (420)(1)	260
WBL				

* Queuing results broken down into 20-foot segments.

** Theoretical result only. Assumes all NB vehicles on Old Harlan Rd wait to turn right at W. Lathrop Rd. It is likely some vehicles in this queue will use the Chevron and Burger King parking service aisles to access Harlan Rd and W. Lathrop Rd.

(1) = (320) = Storage distance (feet).

(2) = (330-530) = Storage length to Old Harlan Rd/I-5 NB Ramps.

Synchro software queuing results for +project conditions.

Source: Field Surveys under direction of Crane Transportation Group Wednesday October 3, 2019.
Compiled by Crane Transportation Group

TABLE 5

INTERSECTION SIGNAL WARRANT EVALUATION

(Do Volumes Meet Caltrans Warrant #3 Volume Criteria Levels?)

Harlan Road/Old Harlan Road

(South of W. Lathrop Road)

EXISTING (2019)

AM PEAK HOUR		PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
NO	NO	NO	NO

CUMULATIVE (2022)

AM PEAK HOUR		PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
NO	NO	NO	NO

Source: Crane Transportation Group

TABLE 6

CUMULATIVE YEAR 2022 95TH PERCENTILE TURN LANE QUEUING WITH & WITHOUT PROJECT

LOCATION	QUEUE (in Feet)			
	AM PEAK HOUR		PM PEAK HOUR	
	W/O PROJECT (Field Surveyed)	WITH PROJECT	W/O PROJECT (Field Surveyed)	WITH PROJECT
W. LATHROP RD/HARLAN RD				
EBL	280 (320)(1)	300	400 (320)(1)	400
EBT	220 (330-530)(2)	240	580 (330-530)(2)	580
NBL	340 (235)(1)	340	340 (235)(1)	340
NBT	180	180	240	240
W.LATHROP/OLD HARLAN RD				
NBR	40	80	60	60
W.LATHROP RD/I-5 SB RAMPS				
WBL	180 (420)(1)	200	240 (420)(1)	240

* Queuing results broken down into 20-foot segments.

** Theoretical result only. Assumes all NB vehicles on Old Harlan Rd wait to turn right at W. Lathrop Rd. It is likely some vehicles in this queue will use the Chevron and Burger King parking service aisles to access Harlan Rd and W. Lathrop Rd.

(1) = (320) = Storage distance (feet).

(2) = (330-530) = Storage length to Old Harlan Rd/I-5 NB Ramps.

Synchro software queuing results for +project conditions.

Source: Field Surveys under direction of Crane Transportation Group Wednesday October 3, 2019.
Compiled by Crane Transportation Group

TABLE 7

Project Gross Trip Generation

DUTCH BROTHERS
(With Drive Through)

SIZE (Square Ft)	AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
	IN		OUT		IN		OUT	
	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol
862	77.8	67	77.8	67	48.2	42	48.2	42

PANDA EXPRESS
(With Drive Through)

SIZE (Square Ft)	AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
	IN		OUT		IN		OUT	
	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol
2200	N/A*	2	N/A*	0	17.0	38	15.67	35

*Not open for breakfast

SONIC
(With Drive Through)

SIZE (Square Ft)	AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
	IN		OUT		IN		OUT	
	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol	Rate/ Sq Ft	Vol
1608	20.5	33	19.7	32	17.0	28	15.67	25

Trip Rate Source for Dutch Brothers: Surveys of Existing Dutch Brothers operations in Stockton and Lodi, California. - See **Appendix E.**

Trip Rate Source for Panda Express and Sonic: Trip Generation Manual 10th Edition by the Institute of Transportation Engineers, 2017.

Compiled by: Crane Transportation Group

TABLE 8

Project Passby and Diverted Link Trip Capture

	I-5 Freeway Diverted Trips	Local Street System Passby Capture & Diverted Link Trips	Primary Trips
Dutch Brothers	45%	35%	20%
Panda Express	25%	30%	45%
Sonic	35%	30%	35%

Sources: Trip Generation Handbook by the Institute of Transportation Engineers 2017
Lathrop City Staff
Crane Transportation Group

TABLE 9

(3 Facilities)

Total Project Gross Trip Generation

Total of Inbound and Outbound Trips on 3 Project Driveways

AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
IN	OUT	Total 2 way	IN	OUT	Total 2 way
102	99	201	108	102	210

Total Project Trips Attracted from Freeway or Ambient Traffic on nearby streets

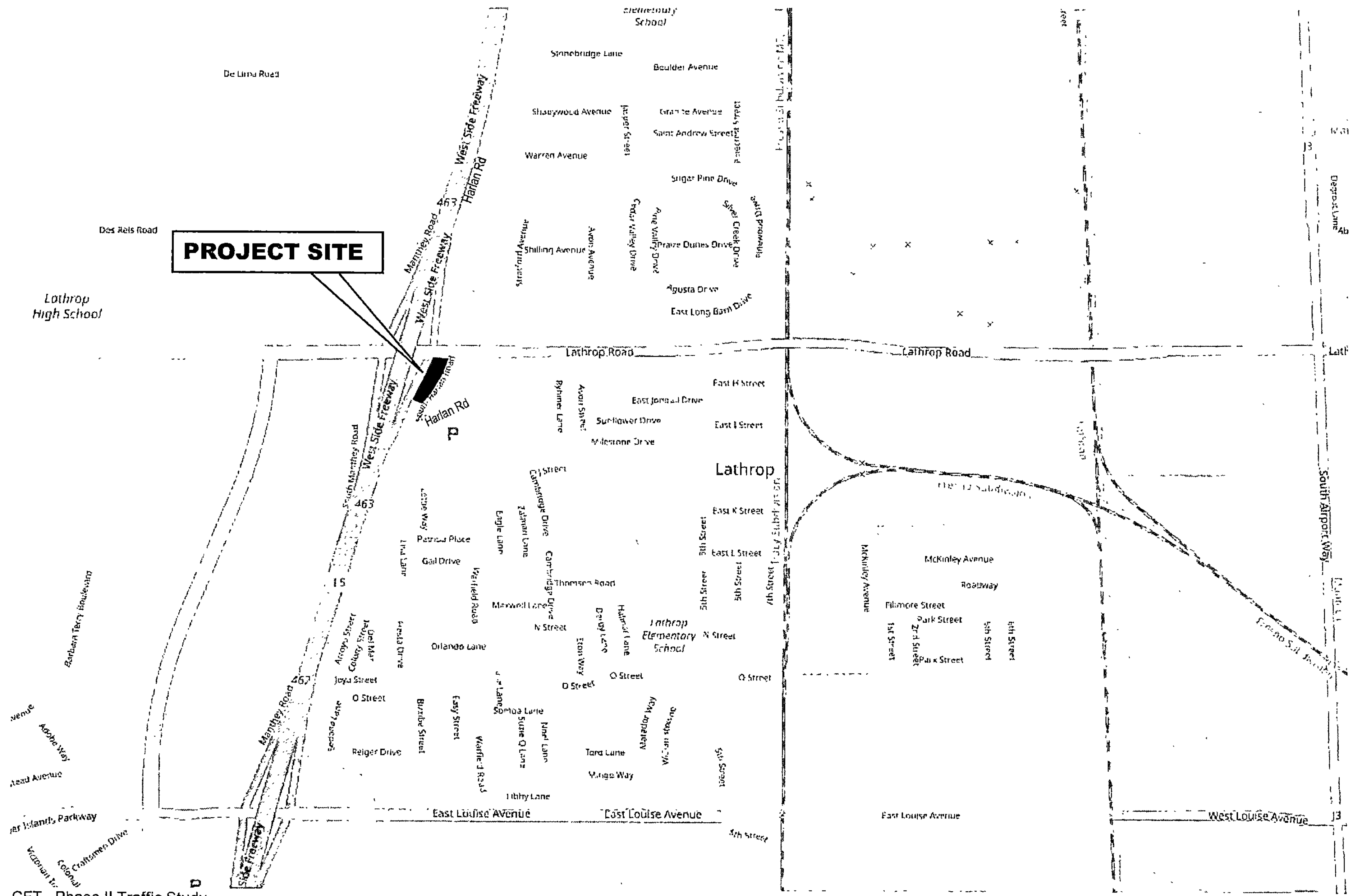
AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
IN	OUT	Total 2 way	IN	OUT	Total 2 way
77	75	150	73	69	142

Net new Project Trips being Attracted to Development Area from other section of Lathrop or Manteca

AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
IN	OUT	Total 2 way	IN	OUT	Total 2 way
25	24	49	35	33	68

Compiled by: Crane Transportation Group.

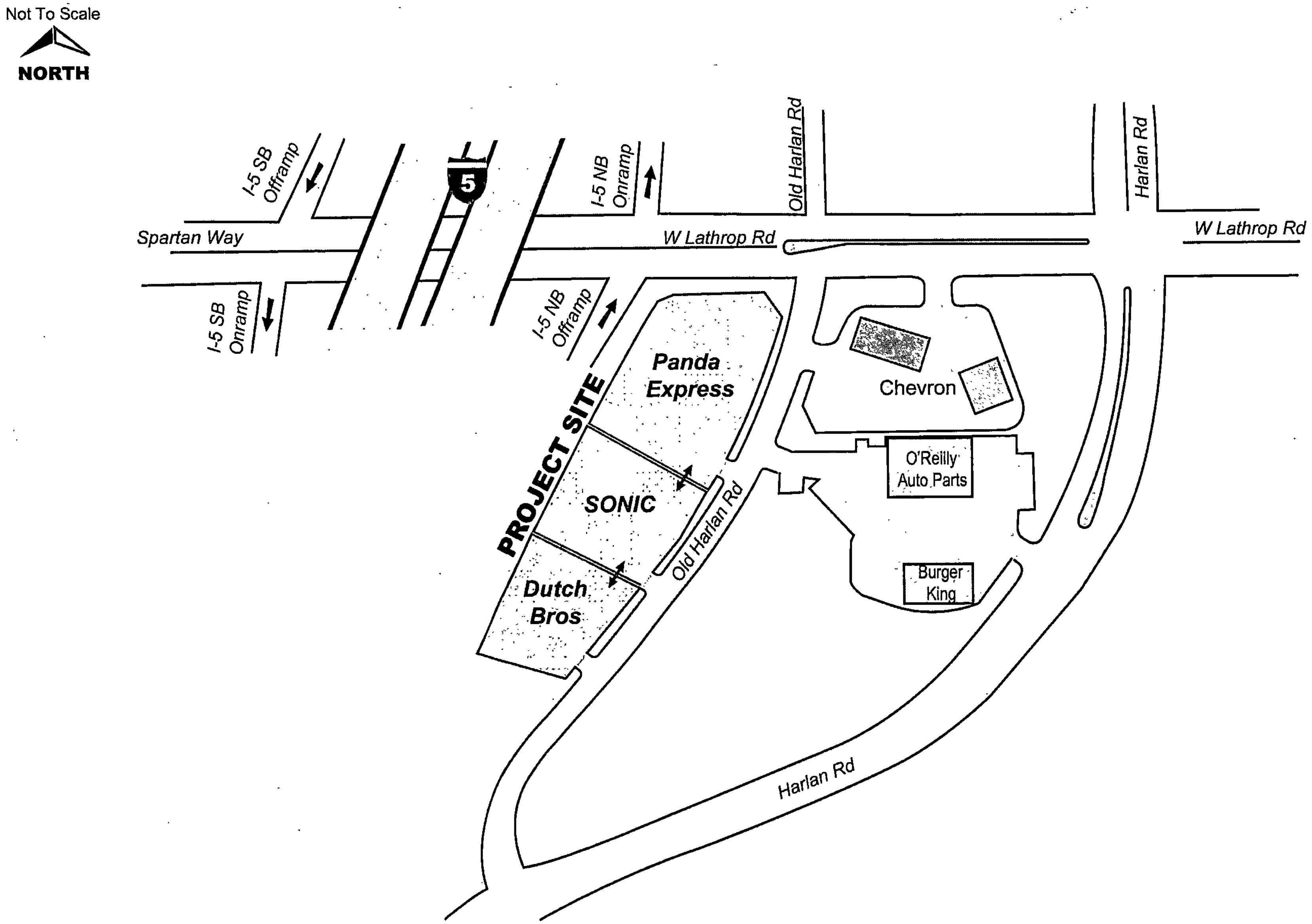
Figures



CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 1
Area Map



CFT - Phase II Traffic Study

Figure 2

Site Plan - Schematic

CRANE TRANSPORTATION GROUP

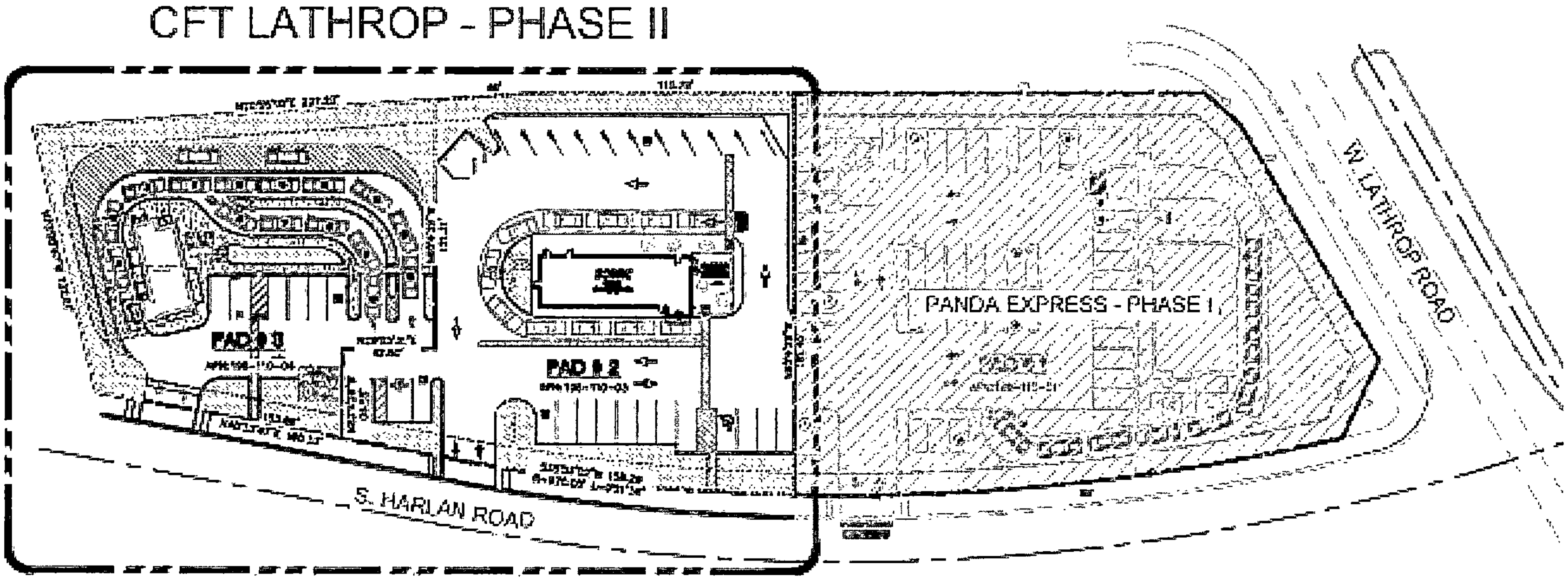
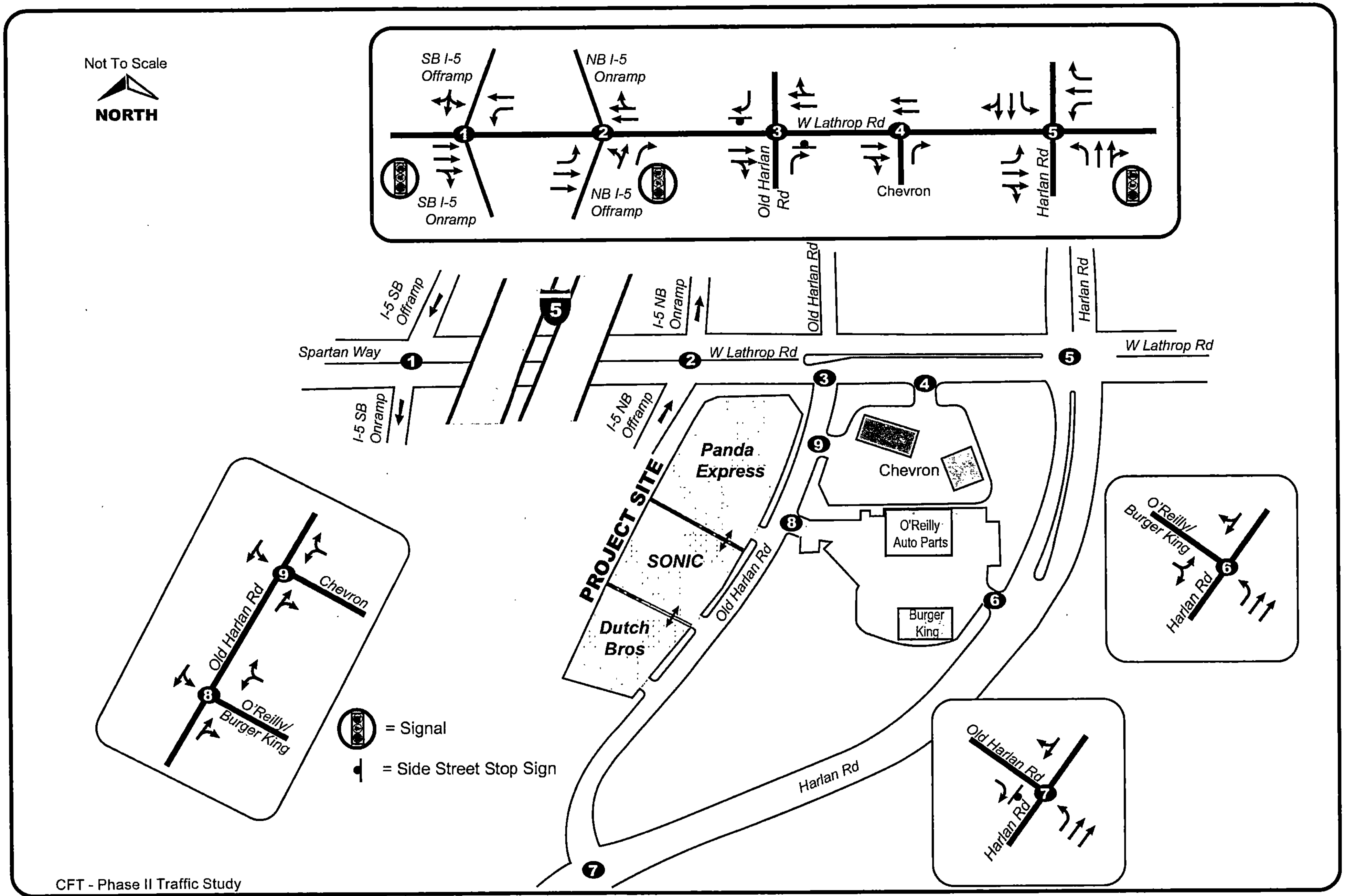


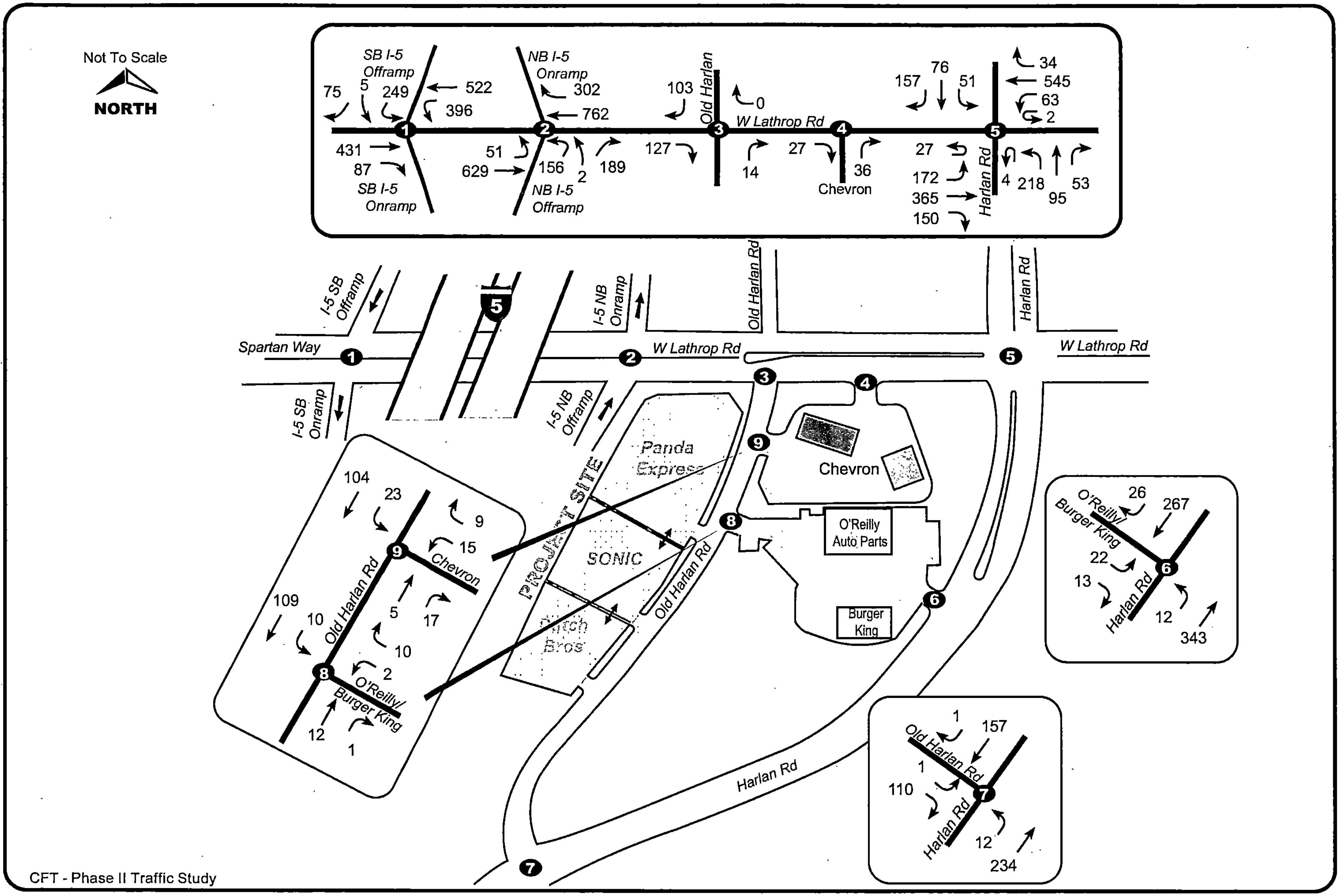
Figure 3

Site Plan - Architectual Version



CRANE TRANSPORTATION GROUP

Figure 4
Existing Intersection Approach Lane Geometrics and Control



CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 5

Existing AM Peak Hour Volumes (without Project)

Thursday October 3, 2019 - 7:00-8:00 AM

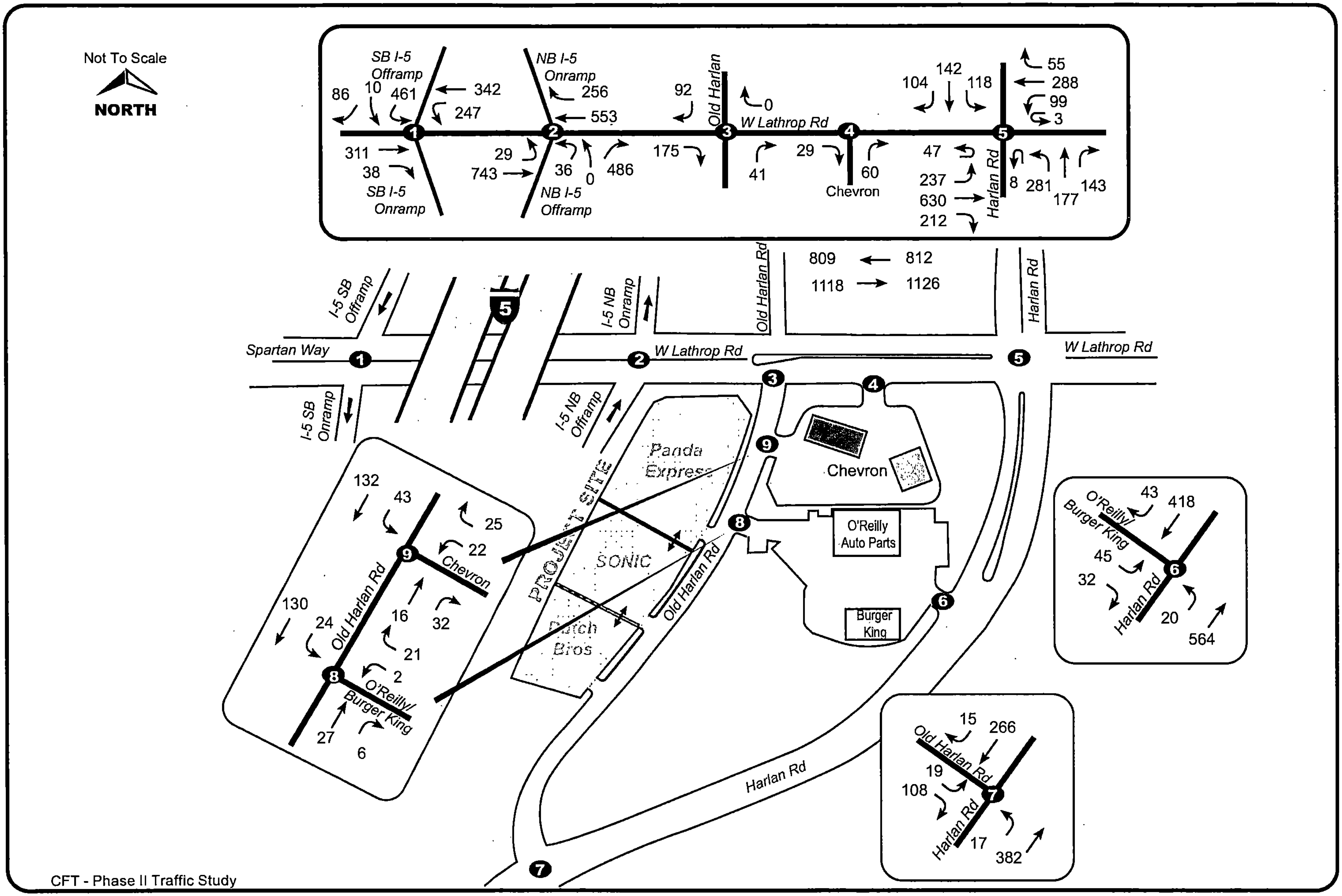
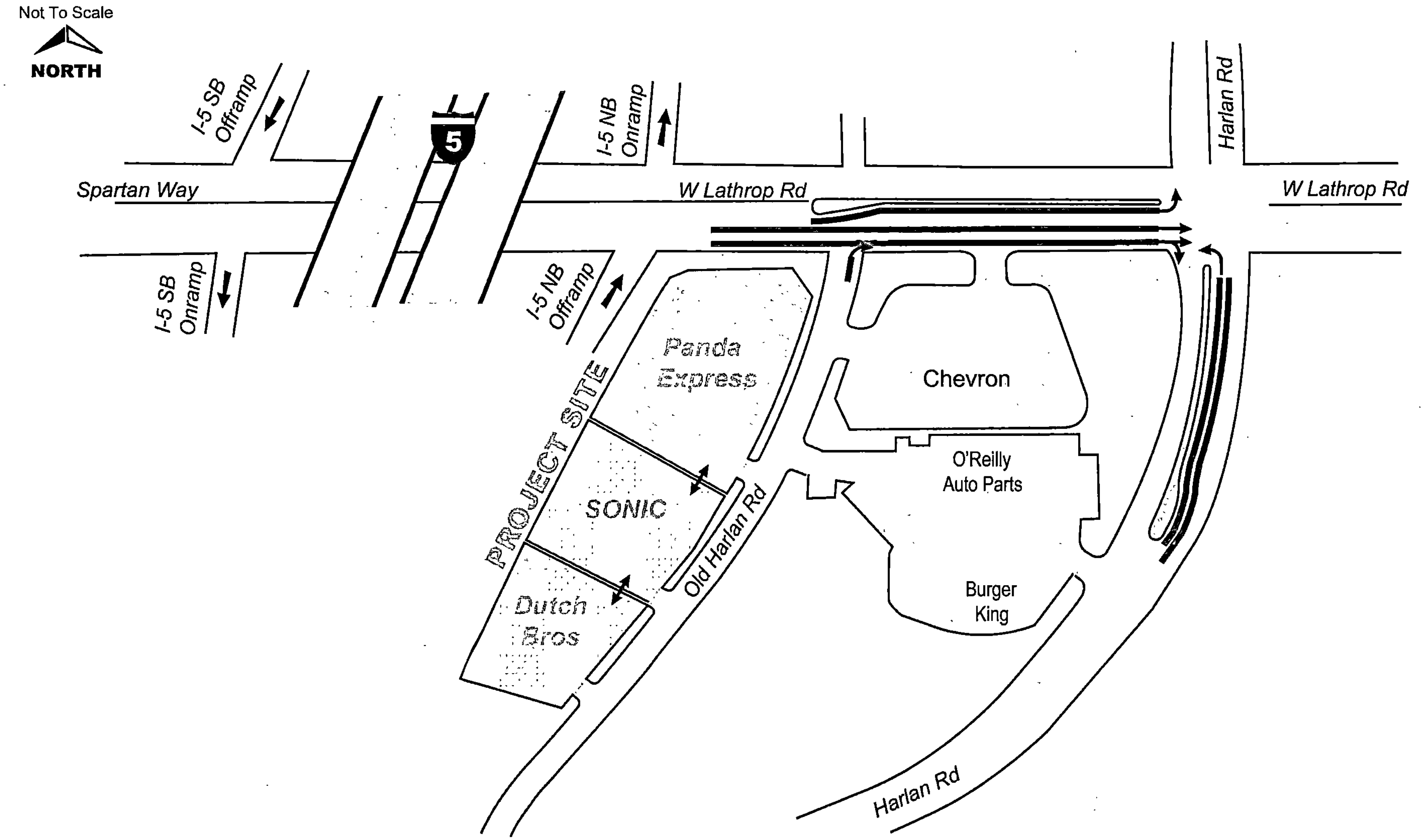


Figure 6

Existing PM Peak Hour Volumes (without Project)

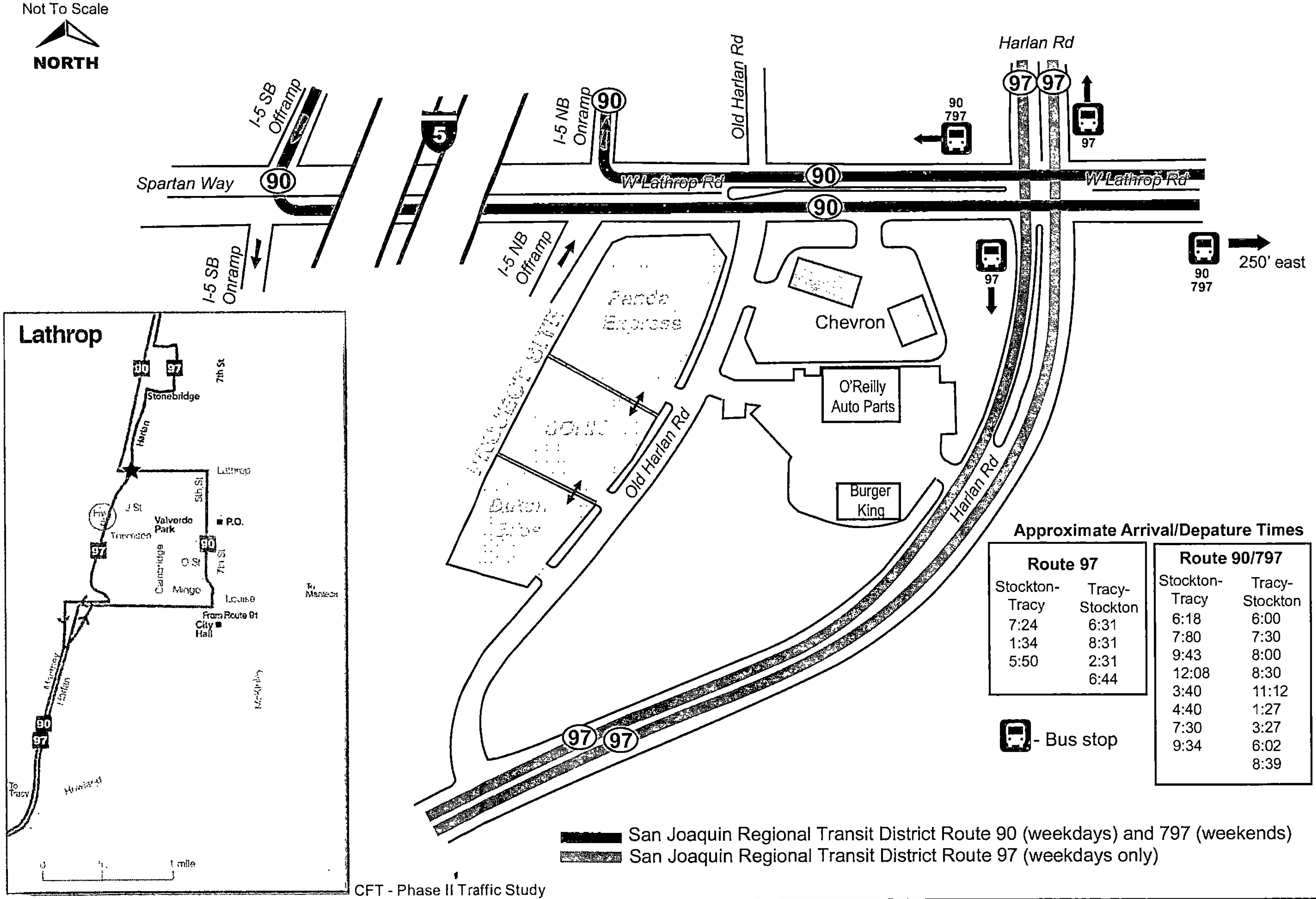
Thursday October 3, 2019 - 5:00-6:00 PM



- AM Peak Hour 95th% Queues Exceeding Left Turn Lane Storage
- PM Peak Hour 95th% Queues Exceeding Left Turn Lane Storage
- PM Peak Hour 95th% Queues Extending past Old Harlan Road Intersection
- PM Peak Hour 95th% Queues for informational purposes

Figure 7

**Existing (without Project)
95th% Queues Exceeding Storage**



Approximate Arrival/Depature Times

Route 97	
Stockton-Tracy	Tracy-Stockton
7:24	6:31
1:34	8:31
5:50	2:31
	6:44

Route 90/797	
Stockton-Tracy	Tracy-Stockton
6:18	6:00
7:80	7:30
9:43	8:00
12:08	8:30
3:40	11:12
4:40	1:27
7:30	3:27
9:34	6:02
	8:39

🚌 - Bus stop

▬ San Joaquin Regional Transit District Route 90 (weekdays) and 797 (weekends)

▨ San Joaquin Regional Transit District Route 97 (weekdays only)

CFT - Phase II Traffic Study

Figure 8
Transit Routes in Vicinity of Project Site

CRANE TRANSPORTATION GROUP

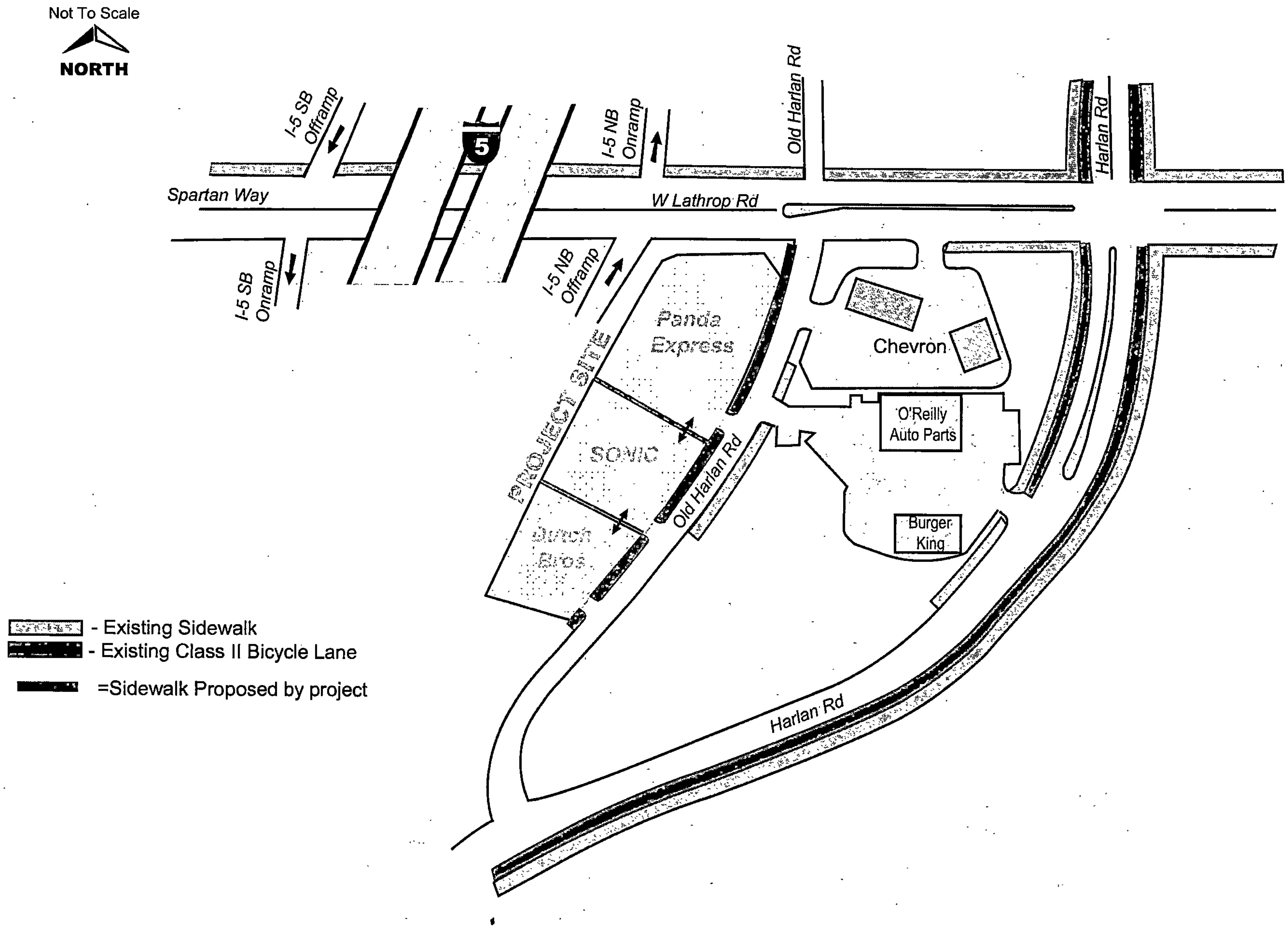


Figure 9

Existing Sidewalks and Bicycle Lanes and Those Proposed by Project

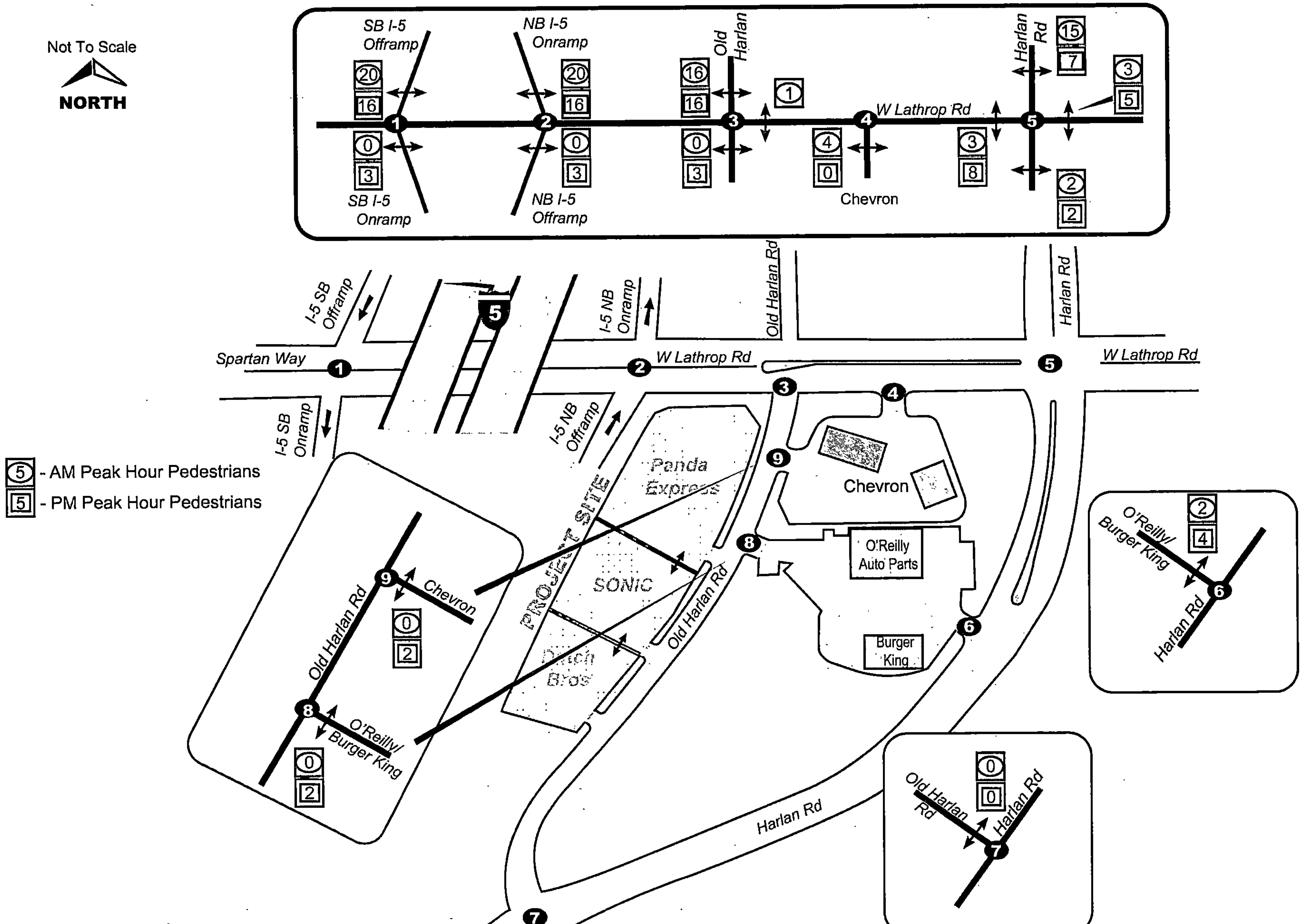
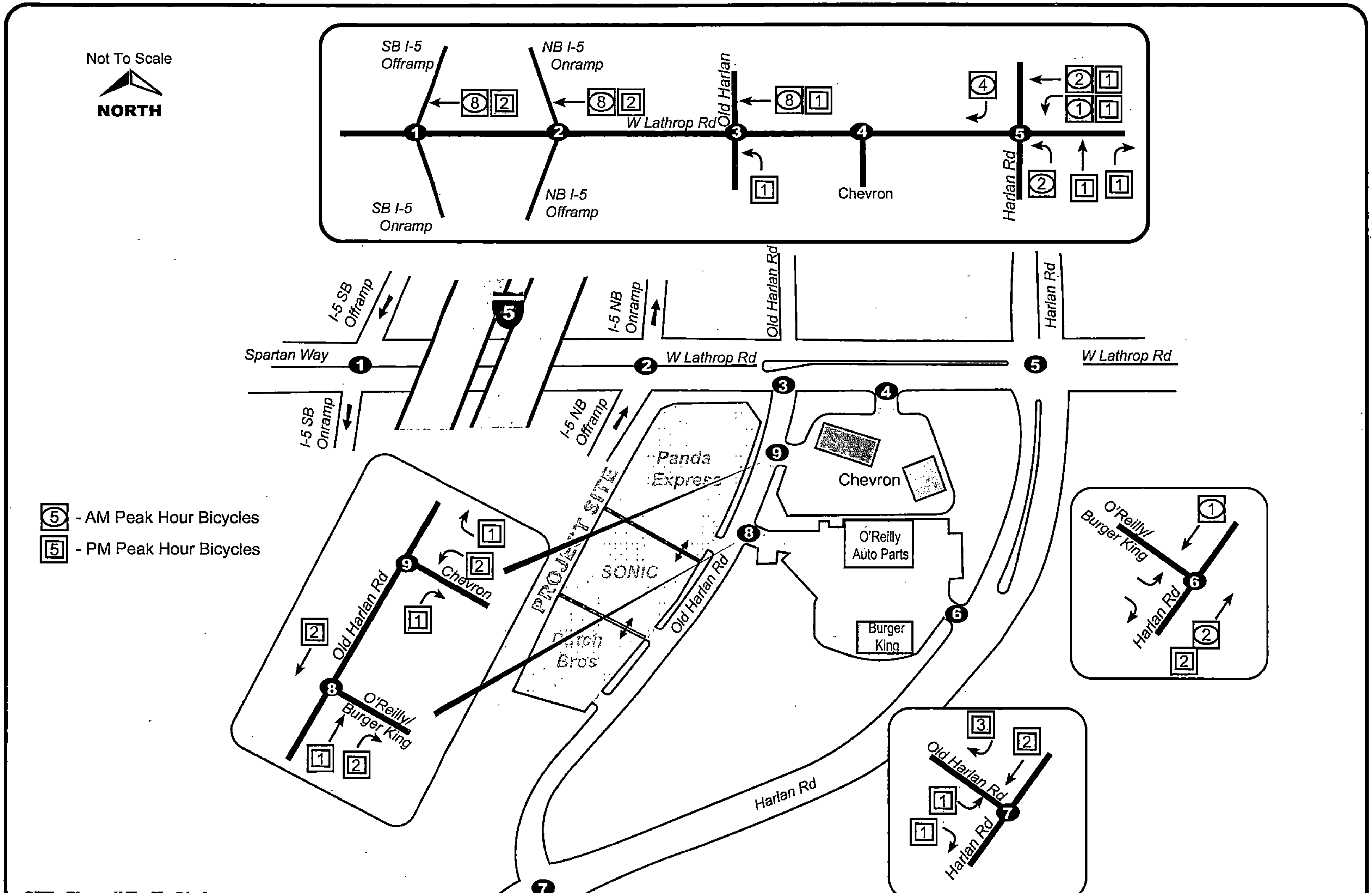


Figure 10

Existing AM and PM Peak Hour Pedestrian Volumes

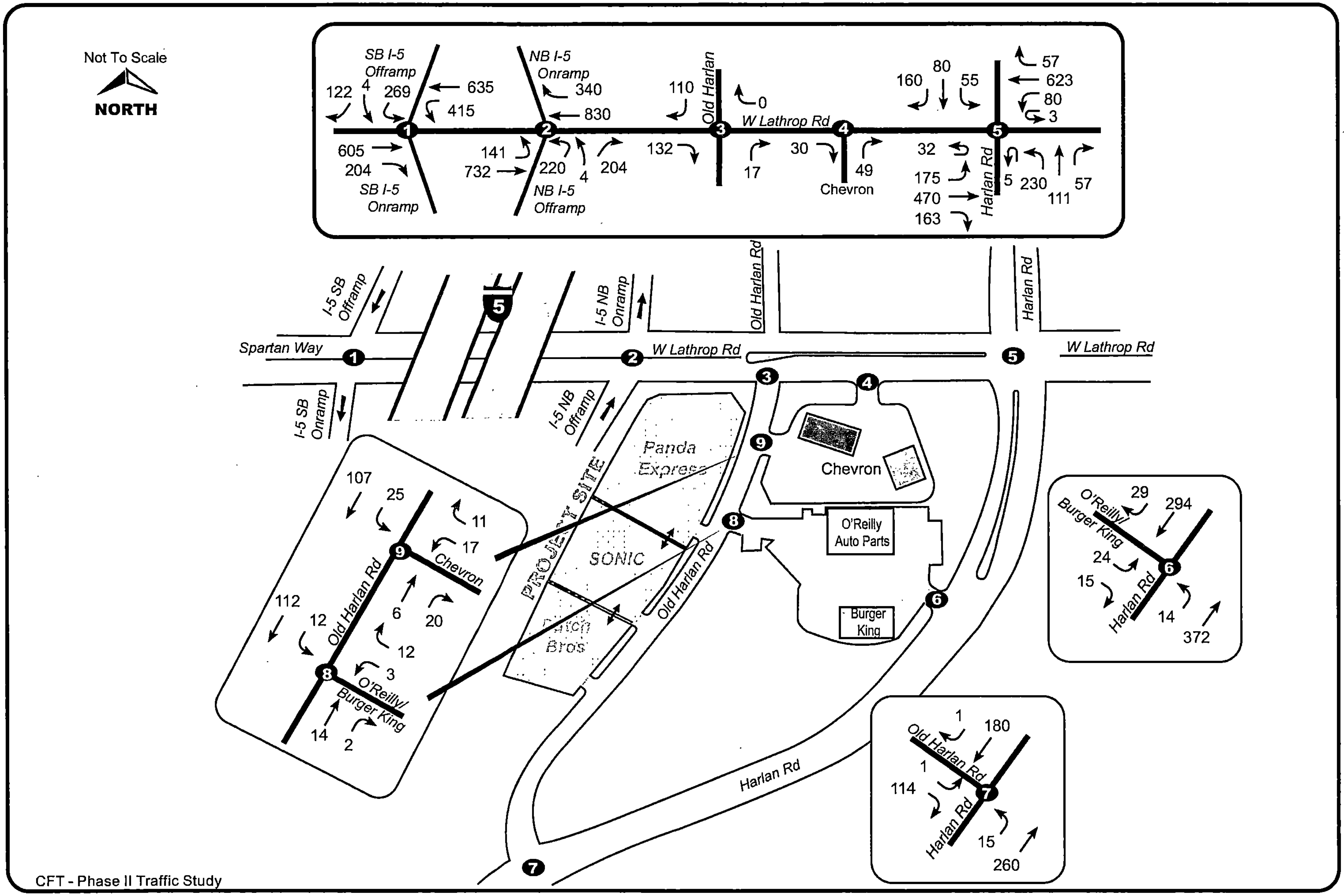


CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 11

Existing AM and PM Peak Hour Bicycle Volumes



CFT - Phase II Traffic Study

Figure 12

Cumulative (Year 2022)

Weekday AM Peak Hour Volumes (without Project)

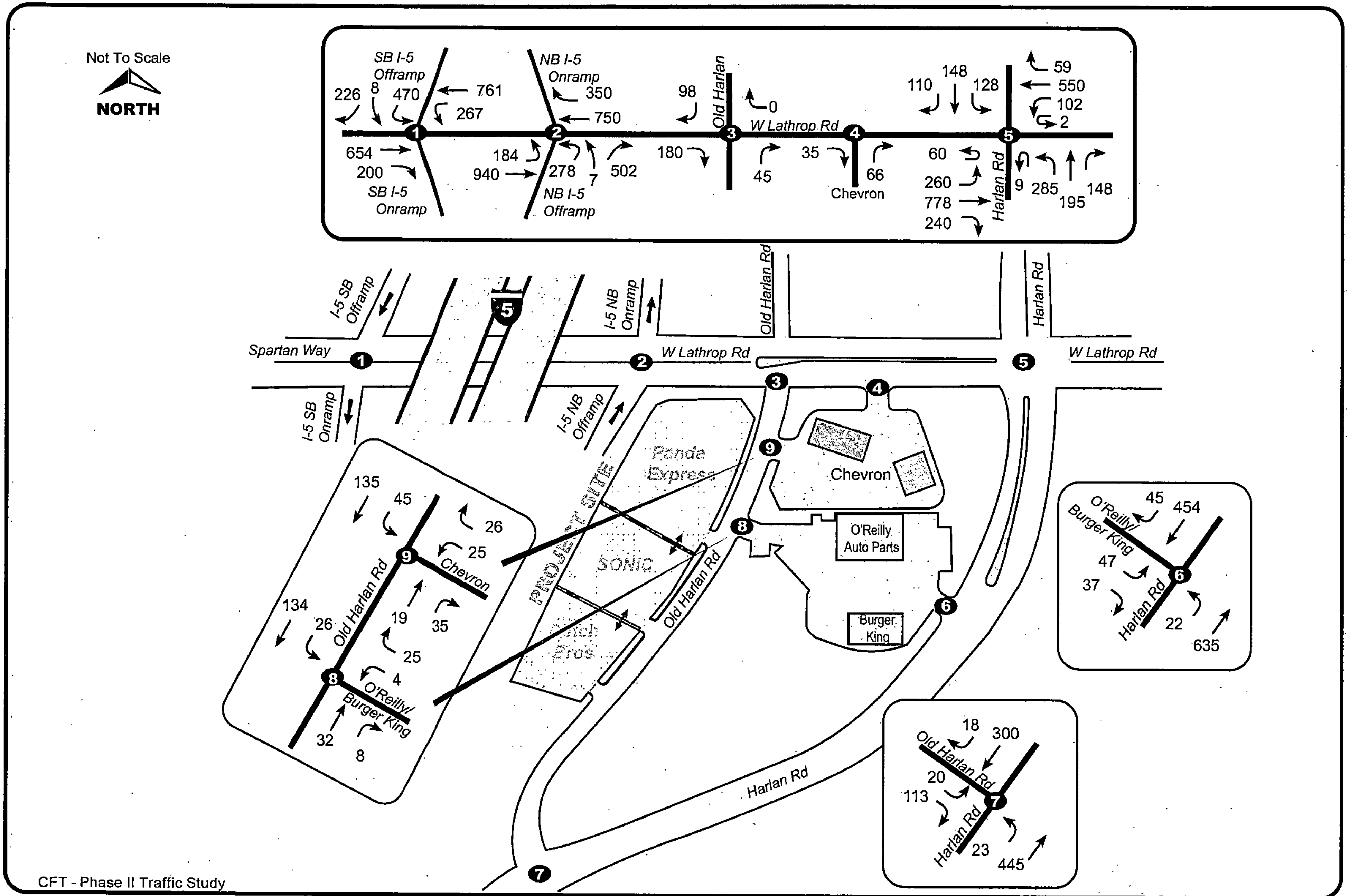
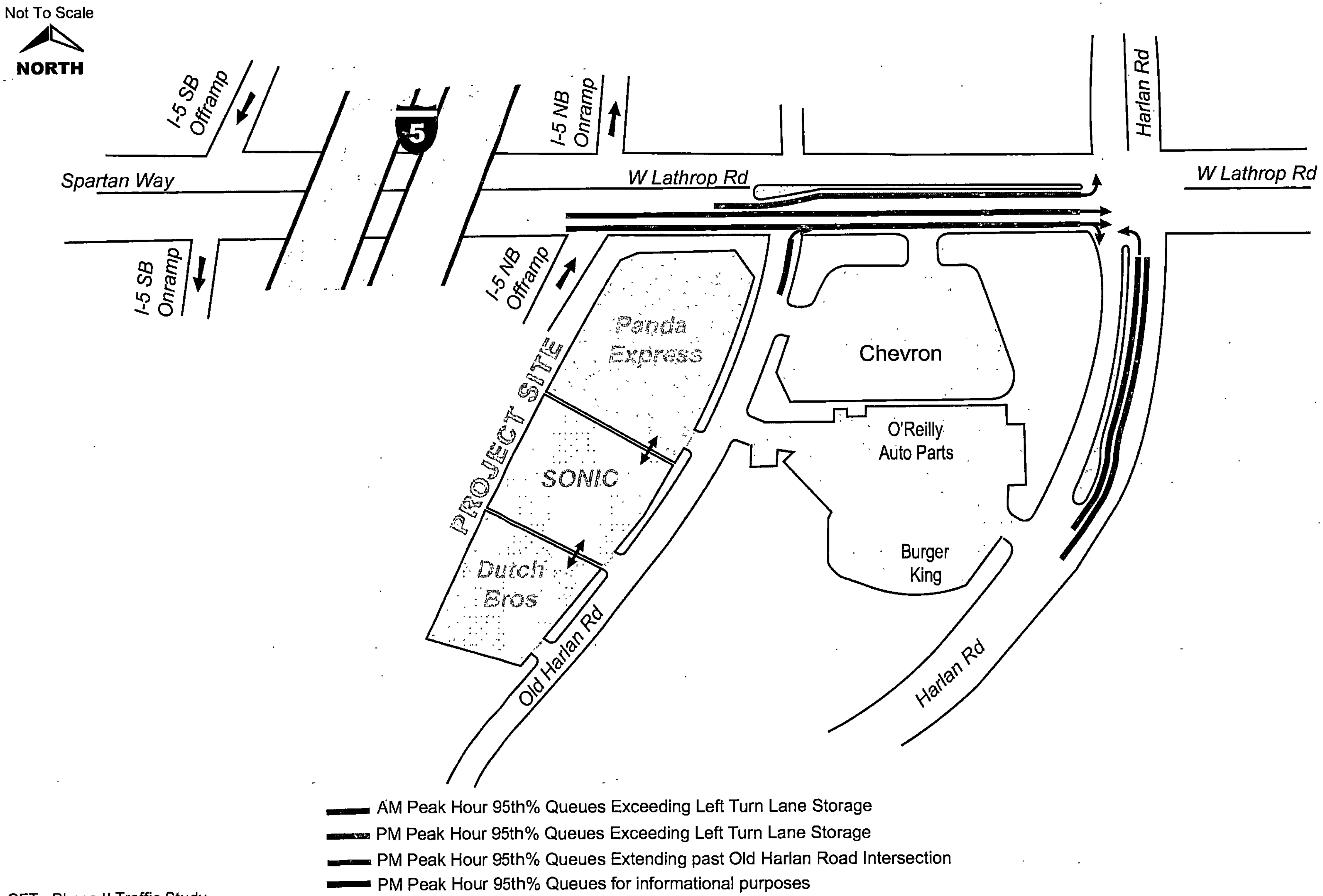


Figure 13

Cumulative (Year 2022)
Weekday PM Peak Hour Volumes (without Project)



CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 14

Cumulative (Year 2022) without Project
95th% Queues Exceeding Storage

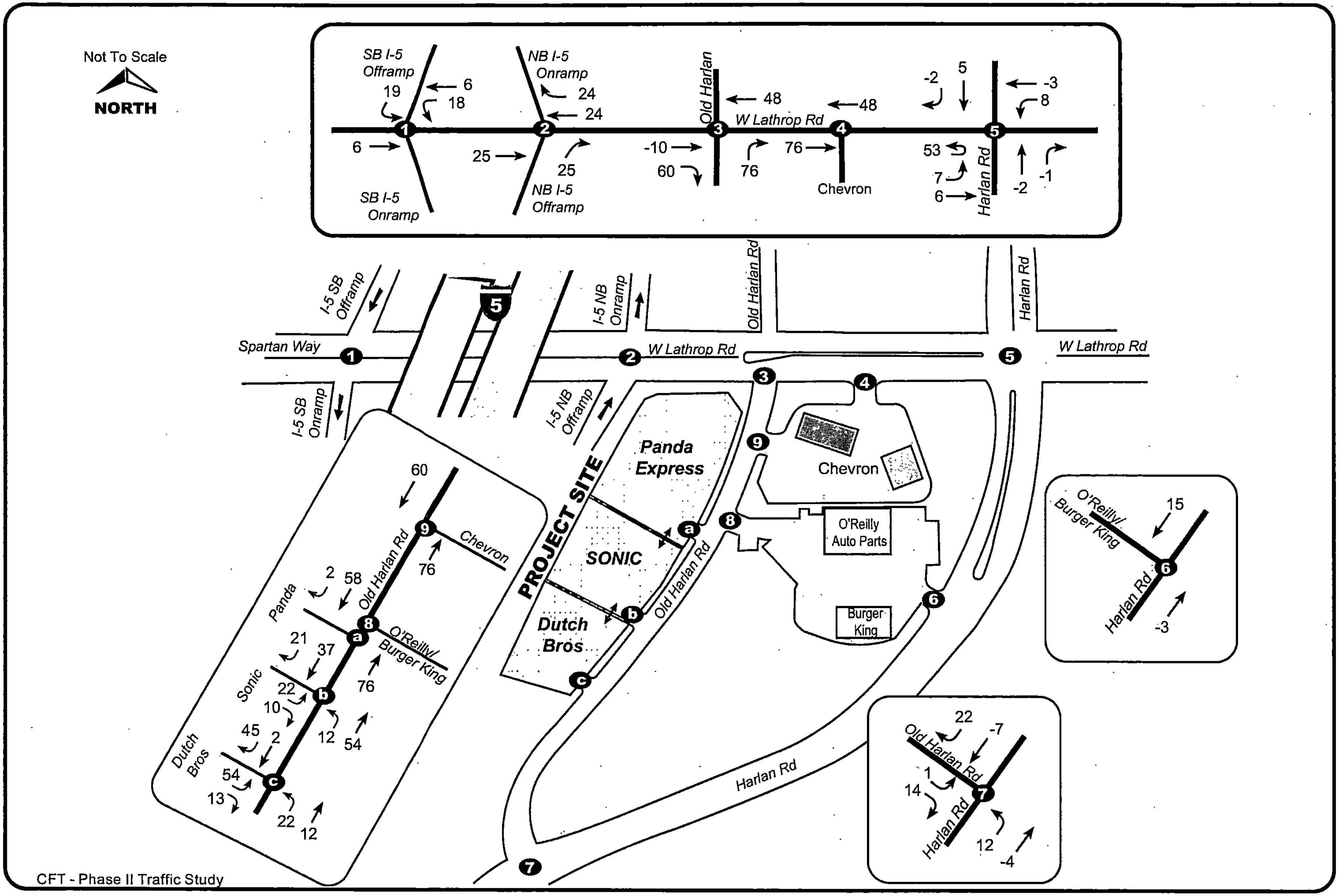
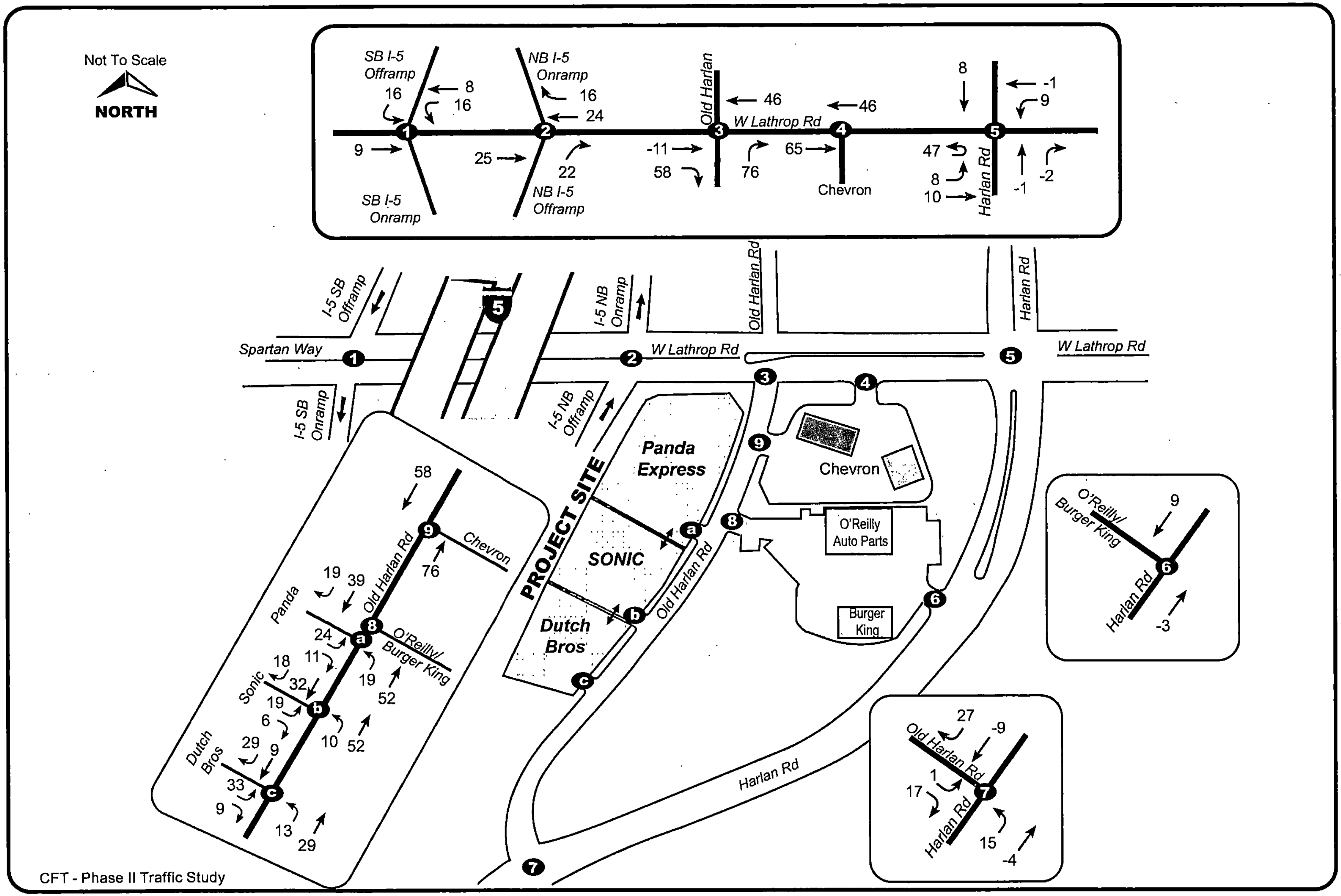


Figure 15

Project Traffic Increment (AM Peak Hour)

CRANE TRANSPORTATION GROUP

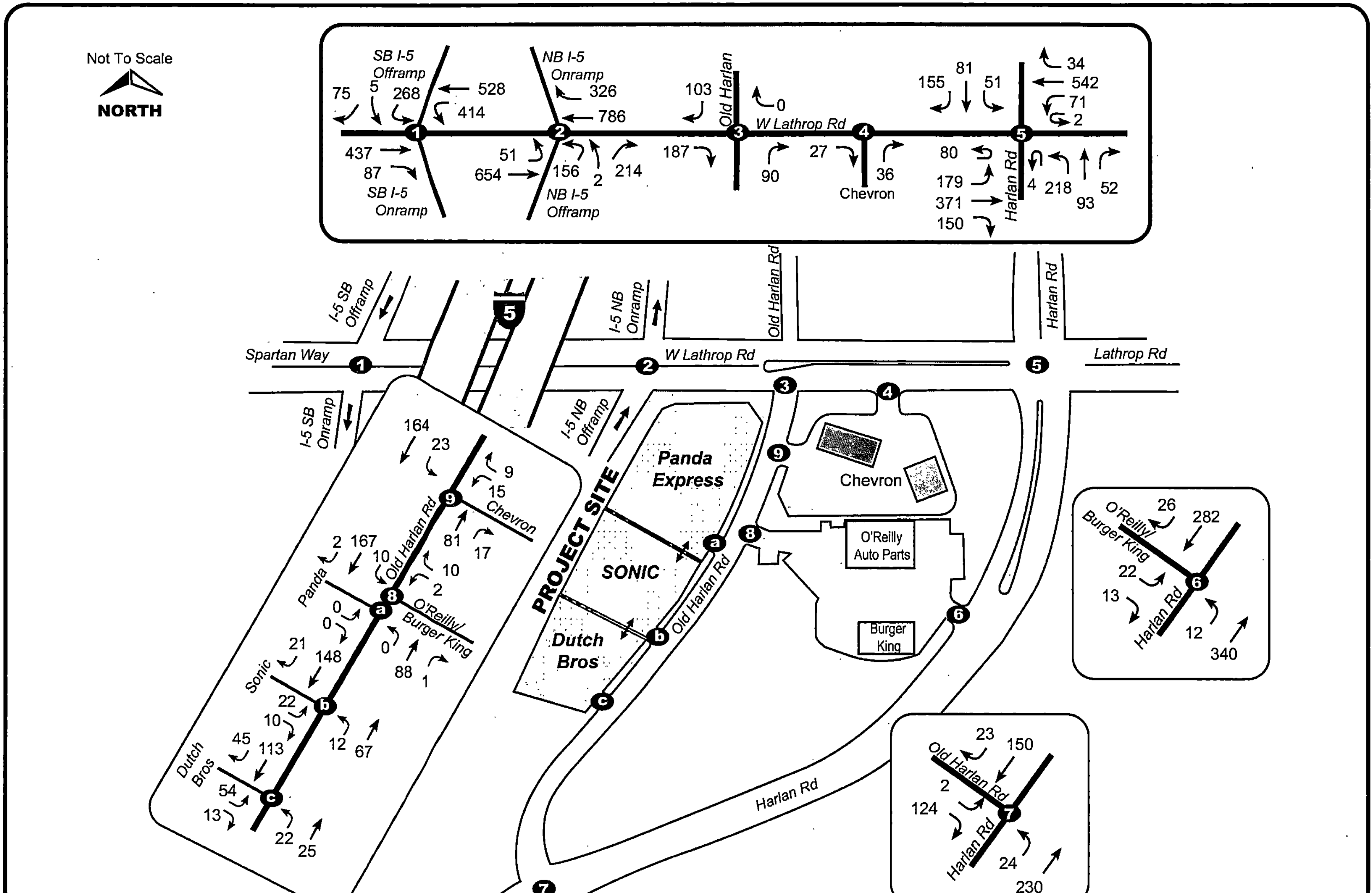


CFT - Phase II Traffic Study

Figure 16

Project Traffic Increment (PM Peak Hour)

CRANE TRANSPORTATION GROUP

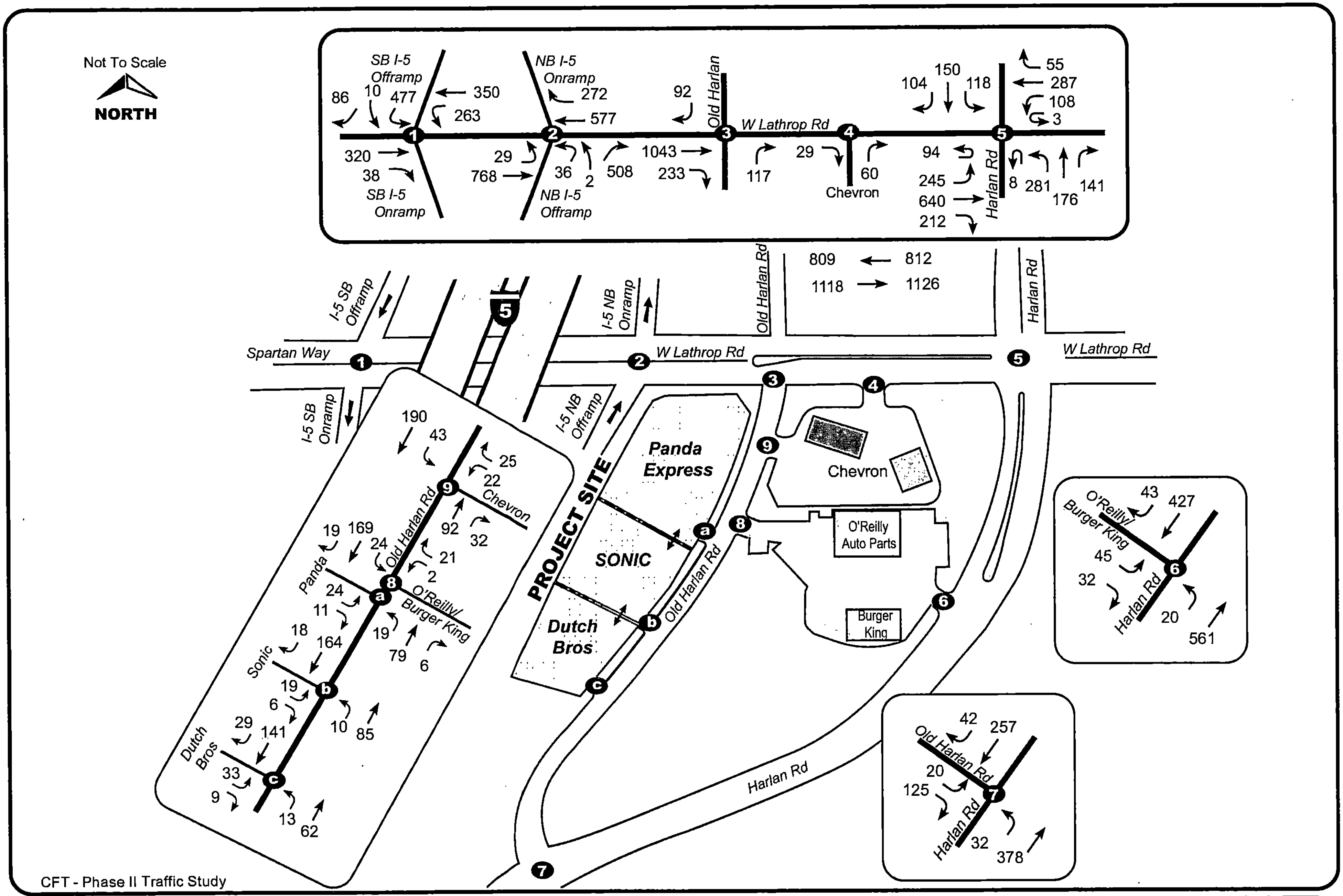


CFT - Phase II Traffic Study

Figure 17

Existing + Project AM Peak Hour Volumes

CRANE TRANSPORTATION GROUP

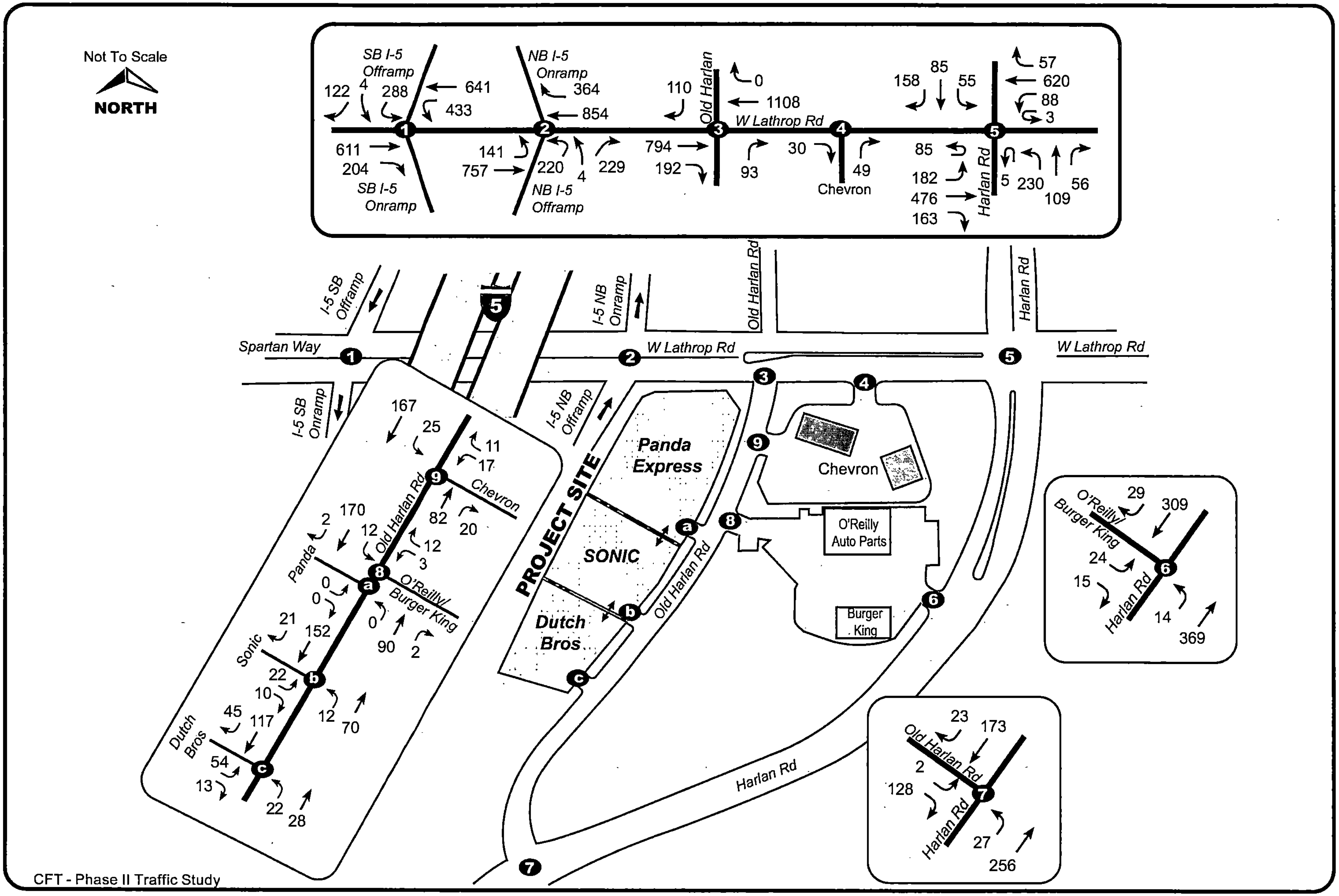


CFT - Phase II Traffic Study

Figure 18

Existing + Project PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 19

Cumulative (Year 2022)
Weekday AM Peak Hour Volumes (with Project)

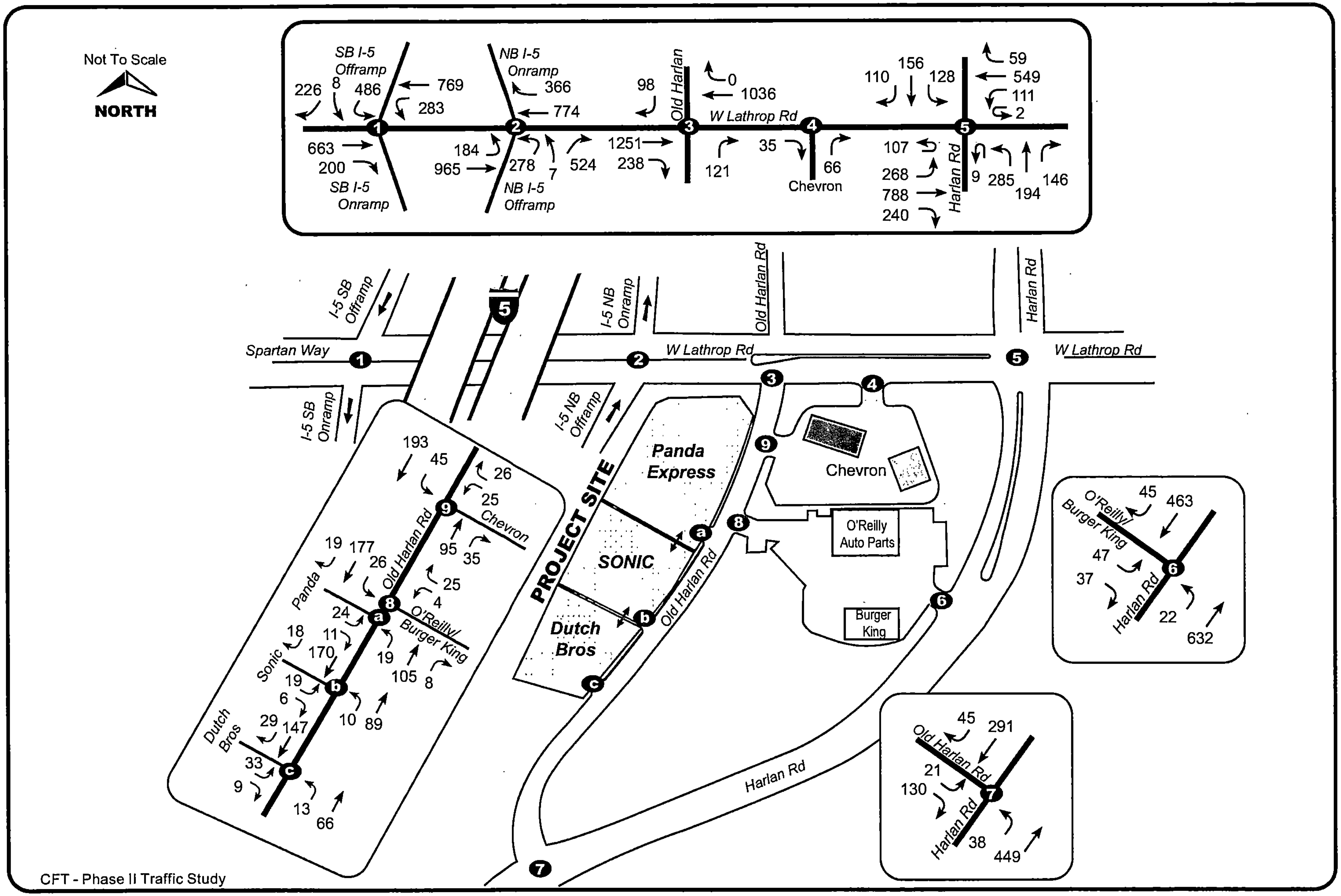
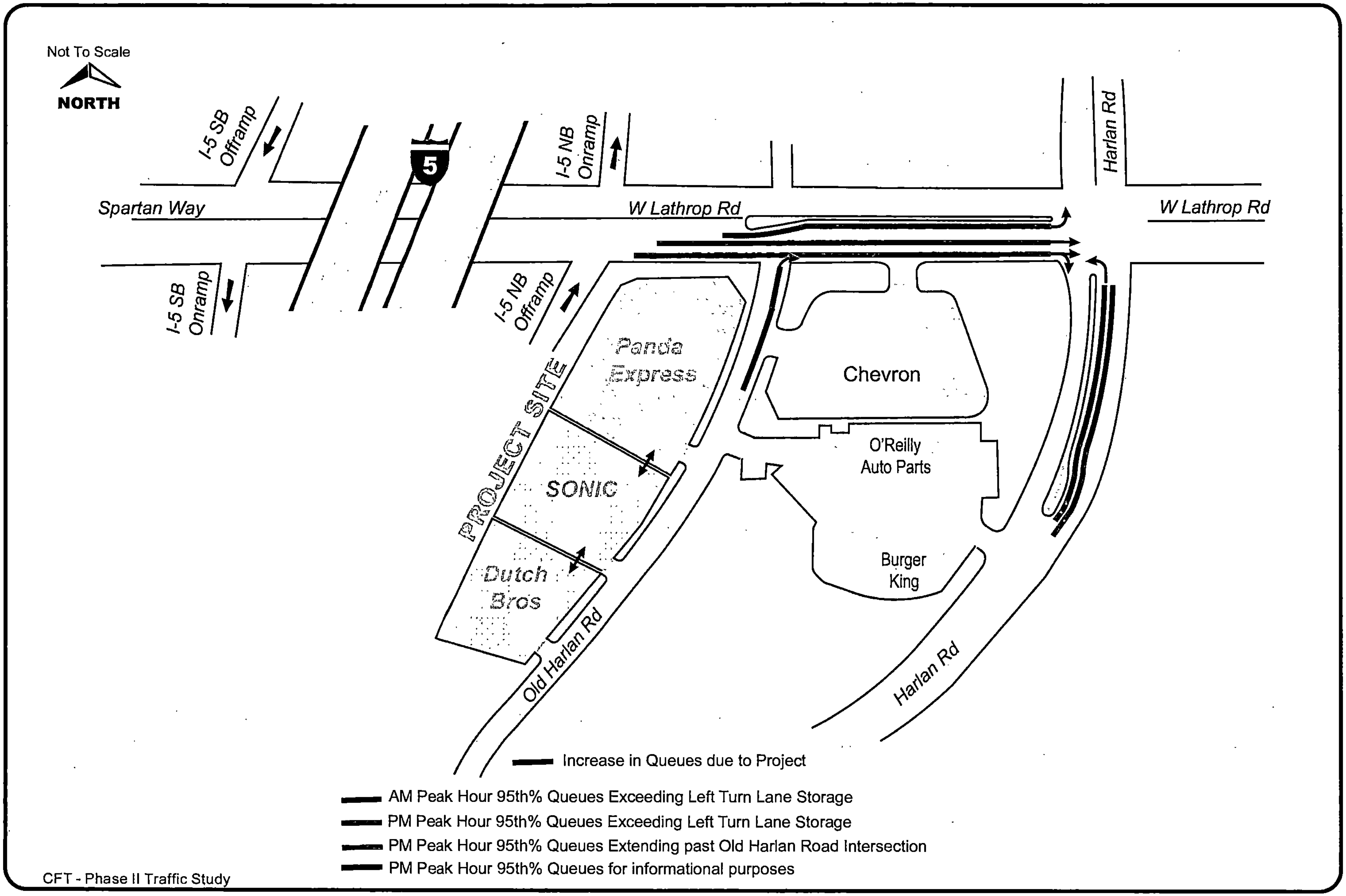


Figure 20
Cumulative (Year 2022)
Weekday PM Peak Hour Volumes (with Project)

CRANE TRANSPORTATION GROUP

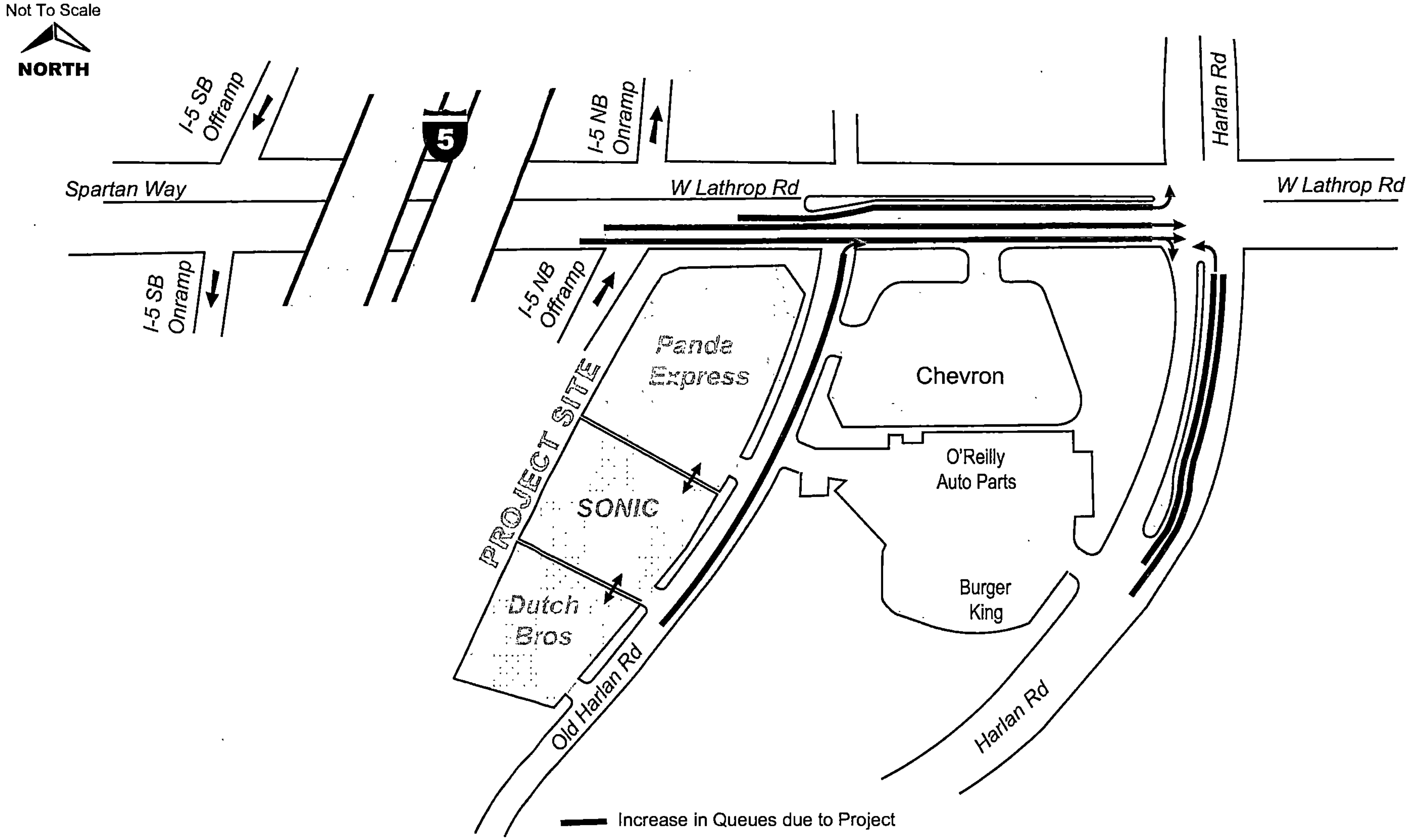


CFT - Phase II Traffic Study

CRANE TRANSPORTATION GROUP

Figure 21

Existing + Project
95th% Queues Exceeding Storage



▬ Increase in Queues due to Project

▬ AM Peak Hour 95th% Queues Exceeding Left Turn Lane Storage

▬ PM Peak Hour 95th% Queues Exceeding Left Turn Lane Storage

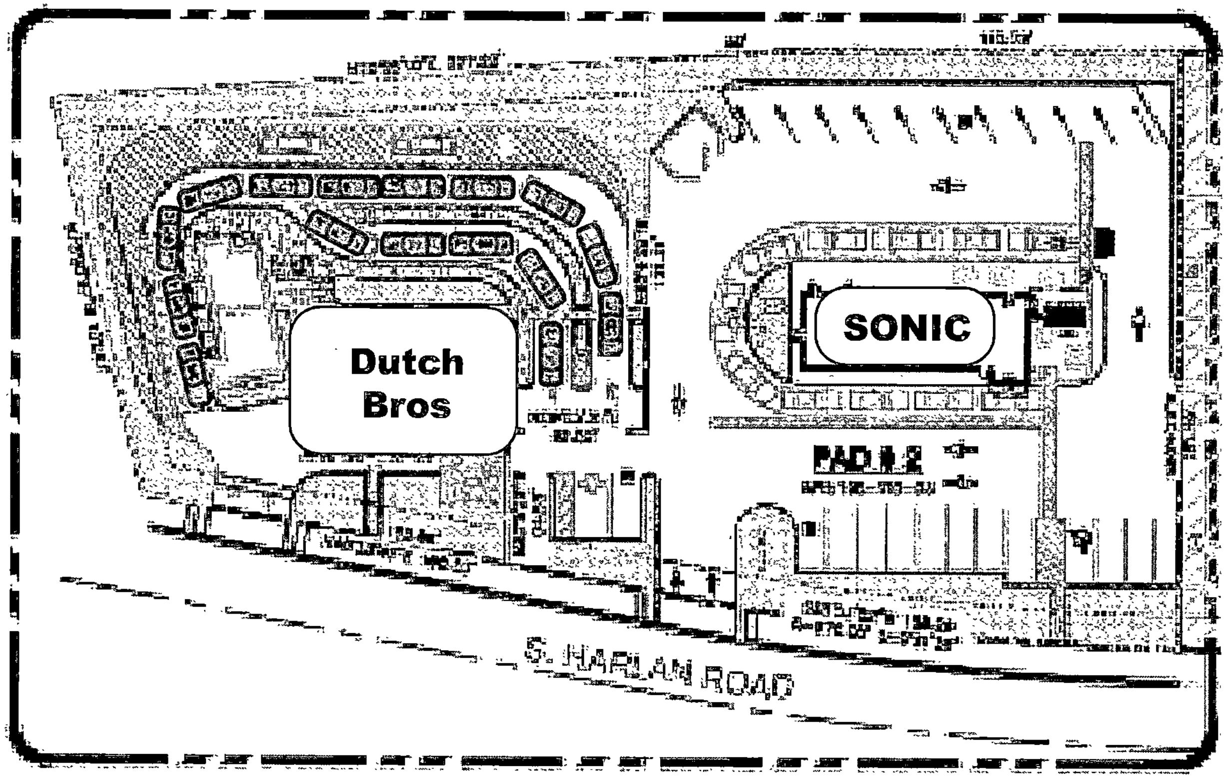
▬ PM Peak Hour 95th% Queues Extending past Old Harlan Road Intersection

▬ PM Peak Hour 95th% Queues for informational purposes

CFT - Phase II Traffic Study

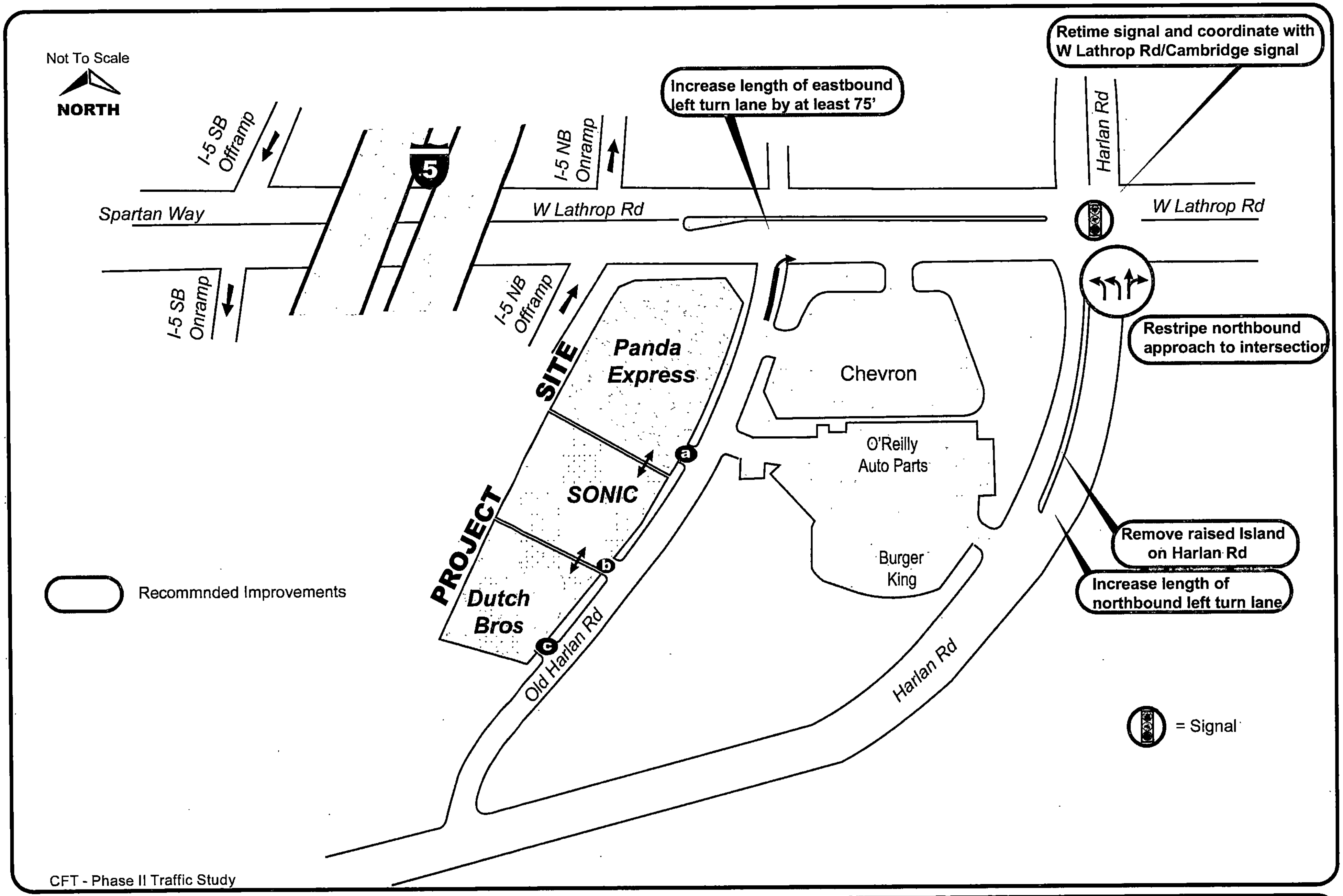
CRANE TRANSPORTATION GROUP

Figure 22
Cumulative (Year 2022) + Project
95th% Queues Exceeding Storage



▭ - Vehicles in Dutch Bros Queue

Figure 23
Dutch Brothers Drive Thru Queueing



Increase length of eastbound left turn lane by at least 75'

Retime signal and coordinate with W Lathrop Rd/Cambridge signal

Restripe northbound approach to intersectio

Remove raised Island on Harlan Rd

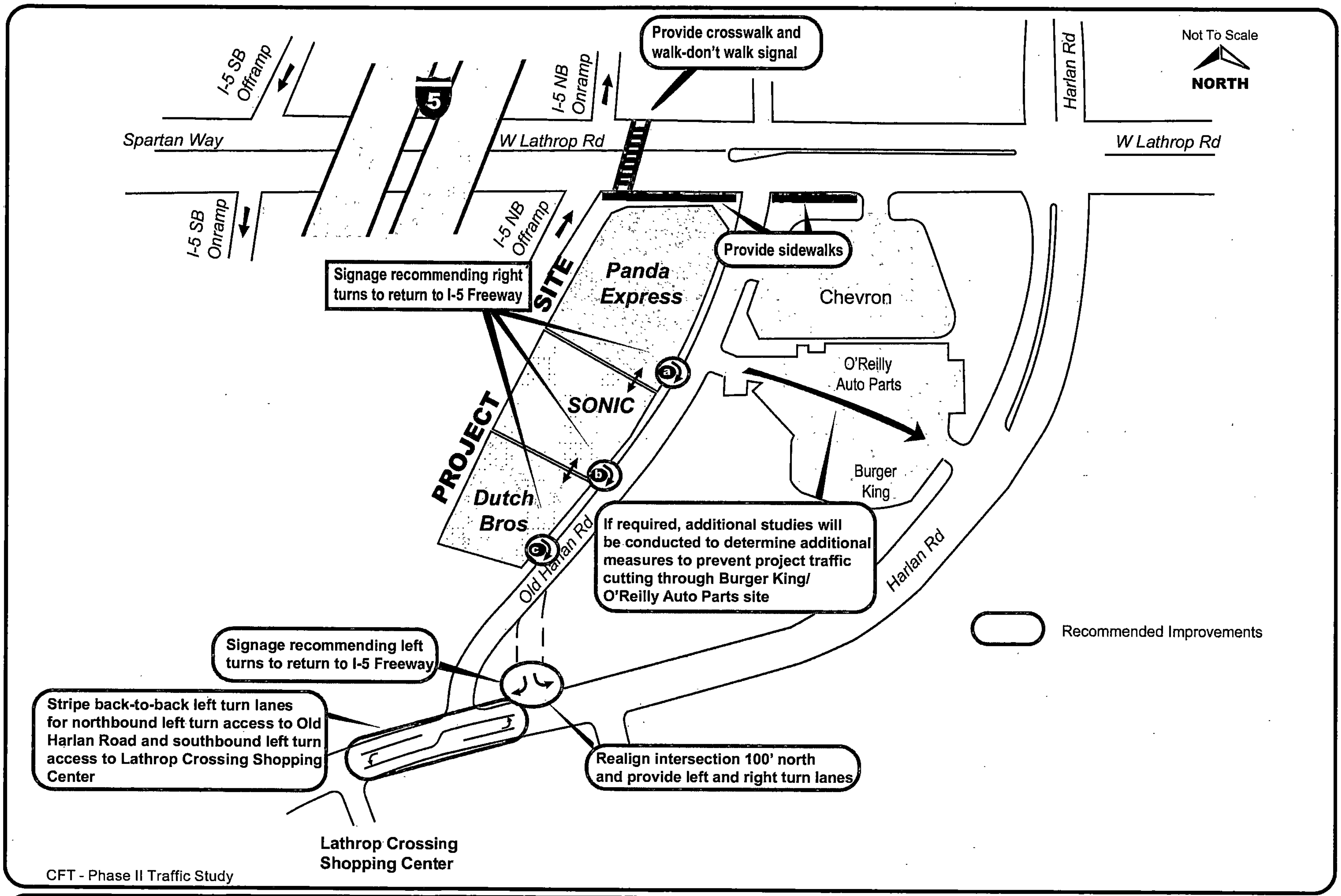
Increase length of northbound left turn lane

CFT - Phase II Traffic Study

Figure 24

Existing and Cumulative (Year 2022)
Recommended Improvements (without Project)
City Responsibility

CRANE TRANSPORTATION GROUP



CRANE TRANSPORTATION GROUP

Figure 25
Existing and Cumulative (Year 2022) + Project Recommended Improvements

Appendices

Appendix D

Dutch Brothers

Trip Rates

Appendix D

Trip Rates

Dutch Brothers Survey Locations near Lathrop versus Institute of Transportation Engineers Trip Generation Manual

Survey Locations	Size of Facility (Square Ft)	AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
		IN		OUT		IN		OUT	
		Trips	Rate/ 1000 Sq Ft	Trips	Rate/ 1000 Sq Ft	Trips	Rate/ 1000 Sq Ft	Trips	Rate/ 1000 Sq Ft
Stockton	810	63	77.8	57	70.4	31	38.3	39	48.2
Lodi	1500	48	32	51	34	29	19.3	36	24.0
Oakley	295	38	128.8	32	108.5	49	166.1	43	145.8
Average of 3 Survey Locations			79.5		71.0		74.6		72.7
ITE RATE (1) Coffee/Donut Shop + Drive through window ***with*** indoor seating	N/A	N/A	45.4	N/A	43.6	N/A	21.7	N/A	21.7
ITE RATE (1) Coffee/Donut Shop + Drive through window ***without*** indoor seating	N/A	N/A	168.5	N/A	168.5	N/A	41.7	N/A	41.7

Trip Rates: Dutch Brothers Surveys - Crane Transportation Group
I.T.E. - Trip Generation Manual 10th Edition by the Institute of Transportation Engineers, 2017

Compiled by: Crane Transportation Group

Appendix E

Dutch Brothers Drive Through Lane Queue Count Summaries

(Stockton, Lodi & Oakley)

Appendix E

Table E1

Dutch Brothers Queue Comparison
Lodi, Oakley and Stockton AM and PM Peak Periods
Thursday Oct 3, 2019

Lodi, CA		Oakley, CA	Stockton, CA	
			1- N/O Side	2- S/O Side
Time:	Max Queue	Max Queue	Max Queue	Max Queue
7:05 AM	2	3	0	3
7:10 AM	3	4	1	2
7:15 AM	2	9	1	3
7:20 AM	1	9	1	2
7:25 AM	1	9	0	1
7:30 AM	3	8	1	3
7:35 AM	2	8	0	4
7:40 AM	2	6	1	4
7:45 AM	1	7	5	8
7:50 AM	2	11	5	8
7:55 AM	2	9	4	9
8:00 AM	1	8	3	6
8:05 AM	1	11	3	9
8:10 AM	1	9	6	7
8:15 AM	1	6	4	8
8:20 AM	0	5	3	9
8:25 AM	0	11	3	9
8:30 AM	2	13	2	7
8:35 AM	2	9	0	6
8:40 AM	1	9	2	8
8:45 AM	1	11	2	8
8:50 AM	2	9	3	8
8:55 AM	3	10	5	7
9:00 AM	1	8	4	6

Source: Crane Transportation Group

Lodi, CA		Oakley, CA	Stockton, CA	
			1- N/O Side	2- S/O Side
Time:	Max Queue	Max Queue	Max Queue	Max Queue
3:05 PM	2	6	2	2
3:10 PM	2	9	0	3
3:15 PM	1	7	0	3
3:20 PM	2	8	3	2
3:25 PM	3	7	1	2
3:30 PM	2	8	7	3
3:35 PM	3	8	3	3
3:40 PM	5	6	1	2
3:45 PM	4	7	0	2
3:50 PM	4	7	0	6
3:55 PM	2	10	2	4
4:00 PM	2	9	3	1
4:05 PM	3	8	2	6
4:10 PM	1	6	0	3
4:15 PM	2	4	0	0
4:20 PM	1	4	2	0
4:25 PM	3	4	0	0
4:30 PM	2	4	0	3
4:35 PM	2	3	0	2
4:40 PM	3	5	0	3
4:45 PM	2	5	0	2
4:50 PM	2	5	0	2
4:55 PM	2	3	0	2
5:00 PM	6	4	0	0
5:05 PM	3	2	0	1
5:10 PM	2	4	0	1
5:15 PM	3	5	0	2
5:20 PM	2	7	0	1
5:25 PM	3	8	3	0
5:30 PM	2	9	0	1
5:35 PM	2	7	0	0
5:40 PM	1	6	0	3
5:45 PM	2	5	0	1
5:50 PM	2	7	0	1
5:55 PM	0	7	0	2
6:00 PM	0	4	0	1

CAR WASH TRIP GENERATION STUDIES

Oakland Road Hotel and Car Wash Transportation Analysis Report

City of San Jose

May 22, 2019

Prepared for:

Blue Wave Express Car Wash

Prepared by:

Stantec Consulting Services Inc.

Sign-off Sheet

This document entitled Oakland Road Hotel and Car Wash Transportation Analysis Report was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Blue Wave Express Car Wash (the “Client”).

Prepared by ______________________________

(signature)

Cathy Lawrence, PE
(949) 923-6064

Reviewed by Keith R. Rutherfurd ______________________________

(signature)

Keith Rutherfurd, PE
(949) 923-6952

Table of Contents

EXECUTIVE SUMMARY I

1.0 INTRODUCTION 1.1
1.1 PROJECT DESCRIPTION 1.1
1.2 CEQA TRANSPORTATION ANALYSIS SCOPE 1.1
1.3 LOCAL TRANSPORTATION ANALYSIS SCOPE 1.5
1.4 REPORT ORGANIZATION 1.6

2.0 EXISTING TRANSPORTATION CONDITIONS 2.1
2.1 VEHICLE-MILES TRAVELED 2.1
2.2 ROADWAY NETWORK 2.1
2.3 TRAFFIC VOLUMES 2.5
2.4 PEDESTRIAN AND BICYCLE FACILITIES 2.5
2.5 TRANSIT FACILITIES AND SERVICES 2.8
2.6 OBSERVED TRANSPORTATION CONDITIONS 2.11

3.0 CEQA TRANSPORTATION ANALYSIS 3.1
3.1 VEHICLE-MILES TRAVELED ANALYSIS 3.1
3.2 OTHER JURISDICTIONS 3.4
  3.2.1 Methodology 3.4
  3.2.2 Significance Criteria 3.4
  3.2.3 Project Impacts and Mitigation Measures 3.4

4.0 LOCAL TRANSPORTATION ANALYSIS 4.1
4.1 BICYCLE AND PEDESTRIAN 4.1
4.2 TRANSIT 4.1
4.3 TRANSPORTATION DEMAND MANAGEMENT 4.1
4.4 INTERSECTION OPERATION ANALYSIS 4.1
  4.4.1 Trip Generation 4.1
  4.4.2 Project Trip Distribution 4.4
  4.4.3 Project Trip Assignment 4.5
  4.4.4 Background Conditions 4.12
  4.4.5 Background plus Project Conditions 4.15
  4.4.6 Project Entrance Analysis 4.15
4.5 QUEUING ANALYSIS 4.19
4.6 SIGNAL WARRANT 4.21
4.7 SITE CIRCULATION AND ACCESS 4.22
4.8 DELIVERY, WASTE, AND MOVING TRUCKS 4.24
4.9 PARKING 4.24
4.10 NEIGHBORHOOD TRAFFIC INTRUSION 4.25

5.0 CONCLUSIONS 5.1

6.0 REFERENCES 6.1

LIST OF TABLES

Table 1-1 Intersection Level of Service Ranges 1.7
Table 2-1 Existing Delay and Level of Service Summary 2.5
Table 4-1 Project Trip Generation Summary 4.2
Table 4-2 Background Delay and Level of Service Summary 4.12
Table 4-3 Background Plus Project Delay and Level of Service Summary 4.18
Table 4-4 Queue Analysis Summary 4.20
Table 4-5 Oakland Road Left-Turn Pocket Length Summary 4.20

LIST OF FIGURES

Figure 1-1 Project Site Location 1.2
Figure 1-2 Proposed Site Plan 1.3
Figure 2-1 City of San Jose VMT per Capita Heat Map 2.2
Figure 2-2 Study Area Street Network and Existing Intersection Lanes 2.3
Figure 2-3 Existing AM Peak Hour Intersection Volumes 2.6
Figure 2-4 Existing PM Peak Hour Intersection Volumes 2.7
Figure 2-5 Bicycle Facilities in the Study Area 2.9
Figure 2-6 Transit Facilities in the Study Area 2.10
Figure 3-1 Hotel Locations in the Vicinity of the Project Site 3.2
Figure 3-2 Car Wash Locations in the Vicinity of the Project Site 3.3
Figure 4-1 General Project Trip Distribution – Business Hotel 4.6
Figure 4-2 General Project Trip Distribution – Automated Car Wash 4.7
Figure 4-3 Net Project AM Peak Hour Trips 4.8
Figure 4-4 Net Project PM Peak Hour Trips 4.9
Figure 4-5 US 101/Oakland Road/Mabury Road Planned Improvements 4.11
Figure 4-6 Background AM Peak Hour Intersection Volumes 4.13
Figure 4-7 Background PM Peak Hour Intersection Volumes 4.14
Figure 4-8 Background Plus Project AM Peak Hour Intersection Volumes 4.16
Figure 4-9 Background Plus Project PM Peak Hour Intersection Volumes 4.17
Figure 4-10 Proposed Car Wash Stacking 4.23

LIST OF APPENDICES

APPENDIX A SAN JOSE VMT EVALUATION TOOL OUTPUT SHEET A.1

APPENDIX B TRANSPORTATION COUNTS B.1

APPENDIX C APPROVED TRIP INVENTORY C.1

APPENDIX D INTERSECTION OPERATIONS ANALYSIS OUTPUT SHEETS D.1

APPENDIX E SIGNAL WARRANT STUDY OUTPUT SHEETS E.1

APPENDIX F CAR WASH TRIP GENERATION CASE STUDY DATA F.1

APPENDIX G PROJECT TRIPS – COMPONENTS G.1

Executive Summary

This transportation analysis has been prepared for the proposed Oakland Road hotel and Blue Wave car wash located on Oakland Road in the City of San Jose. A transportation analysis is required for this project in compliance with the City of San Jose's Transportation Impact Policy (Council Policy 5-1) and the Santa Clara County's Congestion Management Program (CMP). The analysis has been prepared in conformance with the requirements contained in the City's Transportation Analysis Handbook (2018).

The project site is located at the southwest corner of Oakland Road and Horning Street. The existing site is located on four separate parcels, which are to be combined and divided into two new parcels for the development of a 116-room business hotel on the north parcel (approximately 1.8 acres) and a drive-through car wash on the south parcel (approximately 0.8 acres). The car wash site also includes self-serve vacuum stalls and associated site improvements. A shared access drive aisle is to be constructed from Oakland Road for access to both proposed sites. A driveway is also proposed on Horning Street.

Project trips were calculated based on ITE trip rates and an existing car wash case study driveway count. Location based reduction for Suburban with Multifamily Housing area was applied to the hotel component of the project. Furthermore, trips generated by the existing development on the site were subtracted from the project trip generation to obtain net new project vehicle trips. A reduction for car wash pass-by trips was not taken, which results in a conservatively high trip generation estimate. The proposed project will generate 45 new vehicle trips during the AM peak hour, 62 new vehicle trips during the PM peak hour, and 723 new vehicle trips daily.

The proposed land uses cannot be evaluated with the City's VMT Evaluation Tool or with the Travel Demand Model because hotel does not fall into one of the designated land use categories. Therefore, the proposed hotel and car wash project trip generation estimates were converted to an equivalent amount of retail square footage based on the daily trips. The resulting retail square footage was compared with the CEQA VMT Analysis Screening Criteria in the Transportation Handbook 2018 to determine conformance to Council Policy 5-1. Based on the daily baseline vehicle trip generation for the proposed project, the project is equivalent to 38,000 square feet of retail uses, which exempts the project from a detailed CEQA VMT analysis per the small infill screening criteria of 100,000 square feet or less of retail space. The project site is located within two miles of the Mineta San Jose Airport, Civic Center, and Downtown San Jose. These local facilities will attract a large portion of the proposed business hotel trips. Furthermore, the proposed hotel will increase employment density (jobs/commercial acres in half-mile buffer), resulting in a lower VMT for the project than the existing VMT for the area. Additionally, motorists will choose a car wash that is convenient rather than drive miles out of their way to a car wash. If the proposed car wash is more convenient than an existing car wash, then motorists will divert existing car wash trips to the proposed car wash. Furthermore, the majority of car wash trips would be pass-by or diverted trips where the motorist stops at the car wash on their way to another destination.

The net new project trips were distributed to the surrounding street network based on levels and locations of development in relation to the project site. Separate distribution patterns for the business hotel and car wash were developed. The business hotel trips were primarily distributed to the Mineta San Jose Airport, Civic Center, and Downtown San Jose, while the car wash trips were distributed to surrounding residential and commercial areas.

The study area was defined and approved by City staff, and five signalized intersections and two stop-controlled intersections in proximity of the project site were identified as the study intersections. Peak hour turning movement counts were collected in July and September 2018 at the study intersections.

Background conditions were developed by adding trips from approved but not yet constructed projects in the City's ATI database to the existing intersection volumes. These background volumes provide the conditions against which the project impacts are evaluated.

The net new project vehicle-trips were added to the background volumes. The delay and LOS for background plus project conditions were compared with the background delay and LOS. Three study intersections operate at deficient LOS under background conditions; however, the project has no adverse effect on these or any of the study intersections.

The City adopted the US-101/Oakland Road/Mabury Road Transportation Development Policy (TDP) in 2007 which defines the interchange capacity available, identifies the required improvements for future development in the area, establishes a traffic fee program for new development in the area to fund the improvements, and allows the LOS of signalized intersections covered by the TDP to temporarily exceed the City's LOS standards until the required improvements are constructed. Major regional transportation projects that are recognized as necessary to provide adequate access to the US 101 freeway and the planned BART station include modification of the US 101/Oakland Road interchange and construction of the US 101/Mabury Road interchange. The City Council established a Traffic Impact Fee program to cover the unfunded cost of the Planned Improvements. Based on the trip distribution and assignment, the project adds 14 PM peak hour trips to the Oakland Road/US 101 interchange. This volume of project trips could be reduced if the business hotel were to provide a shuttle service for guests to and from destinations such as the airport.

The project entrance on Oakland Road opposite Boardwalk Way is proposed to be signalized. The raised median would be modified, and the existing residential development on the east side of Oakland Road (Modern Ice Townhomes) would be given full access to Oakland Road. This location would operate at LOS F without a signal. With a signal, the intersection operates at LOS B during the AM and PM peak hours. A signal and median break at this location would provide pedestrian connectivity between the residential uses on the east side and the commercial uses on the west side of Oakland Road and a controlled crossing of Oakland Road for bicyclists.

The project has no adverse effect on the surrounding streets and no off-site mitigation is necessary.

1.0 INTRODUCTION

This transportation analysis has been prepared for the proposed Oakland Road hotel and Blue Wave car wash located on Oakland Road in the City of San Jose. A transportation analysis is required for this project in compliance with the City of San Jose's Transportation Analysis Policy (Council Policy 5-1) and the Santa Clara County's Congestion Management Program (CMP). The analysis has been prepared in conformance with the requirements contained in the City's Transportation Analysis Handbook (2018). This report summarizes the project's potential transportation impacts, if any, and presents appropriate mitigation measures, if necessary.

1.1 PROJECT DESCRIPTION

The project site is located on the west side of Oakland Road between Horning Street and Madera Avenue. **Figure 1-1** illustrates the location of the project site. The existing site is located on four separate parcels, which are to be combined and divided into two new parcels for the development of a 116-room business hotel on the north parcel (approximately 1.8 acres) and an automated drive-through car wash on the south parcel (approximately 0.8 acres). The car wash site also includes self-serve vacuum stalls and associated site improvements. A shared access drive aisle is to be constructed from Oakland Road for access to both proposed sites. This driveway is opposite Boardwalk Way, and the existing median break is proposed to be modified to provide full access to the project driveway, as well as Boardwalk Way, from Oakland Road. A traffic signal at this location has been evaluated. A driveway is also proposed on Horning Street. **Figure 1-2** illustrates the proposed site plan.

The project site is currently developed with permitted auto-related businesses such as a tire and wheel shop, truck and car wash, and graphic design/car wrap business.

1.2 CEQA TRANSPORTATION ANALYSIS SCOPE

Council Policy 5-1 aligns with California Senate Bill 743 (SB 743) that establishes the thresholds for transportation impacts under the California Environmental Quality Act (CEQA), removing transportation "Level of Service" (LOS) based on delay and congestion and replacing it with "Vehicle-Miles Traveled" (VMT). VMT refers to the amount of and distance of automobile travel in a day attributed to a development project. VMT is measured by multiplying the total vehicle trips generated by a development project by the average distance of those trips. In the City of San Jose, VMT is calculated using the Origin-Destination VMT method, which measures the full distance of vehicle travel with one end within the project.

Increased vehicle travel associated with development projects results in several undesirable consequences. Increased vehicle travel leads to increased greenhouse gases and poor air quality, leads to health issues such as chronic diseases (associated with poor air quality and reduced physical activity) and worse mental health, has negative effects on other road users such as pedestrians, cyclists, and transit users, results in more vehicle collisions, requires more infrastructure which increases impermeable surfaces (raising flood risks and polluting waterways) and loss of natural habitat, and increases interactions with nature leading to more collisions with wildlife. SB 743 attempts to diminish these undesirable outcomes by encouraging development that reduces vehicle travel.

Figure 1-1

Project Site Location

Figure 1-2

Proposed Site Plan

The intention of SB 743 is to “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” VMT exceeding an applicable threshold of significance may indicate a significant impact. If a project is found to have a significant impact on VMT, the impact must be reduced by modifying the project VMT to an acceptable level and/or mitigating the impact through multimodal transportation improvements or establishing a Trip Cap.

A project could have a significant transportation impact on the environment if it:

a) Conflicts with a plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle lanes, and pedestrian paths

b) Conflicts or is inconsistent with CEQA Guidelines Section 15064.2, Subdivision (b)(1)

c) Substantially increases hazards due to a geometric design feature or incompatible uses

d) Results in inadequate emergency access.

The City has chosen a net increase in the total existing VMT for the region (i.e. the Bay Area’s Metropolitan Planning Organization’s boundaries) as the determination of significant transportation impact. For development projects that do not meet the City’s screening criteria, the VMT analysis consists of a comparison of the project’s potential impacts related to VMT and other significance criteria. For retail, hotel, or school projects, the total VMT for the region without and with the project is calculated. The threshold for significance for retail projects is a net increase in the existing regional total VMT.

A detailed CEQA transportation analysis is not required if a project meets the City’s screening criteria. New retail development typically redistributes existing trips instead of creating new trips. Local-serving retail projects may shorten vehicle-trips and reduce VMT by diverting trips from existing local retail to new local retail without measurably increasing trips outside the local area. The City has defined retail projects below 100,000 square feet as local-serving shopping centers. Therefore, it is presumed that retail projects no larger than 100,000 square feet will have a less than significant VMT impact and do not require a detailed CEQA transportation analysis.

As City staff outlined in the workscope letter for this project dated May 17, 2018, the proposed land uses cannot be evaluated with the City’s VMT Evaluation Tool or with the Travel Demand Model. The VMT Evaluation Tool has four categories of land uses (Residential, Office, Retail, and Industrial), and hotel does not fall into any of the designated land use categories. Therefore, both the business hotel and the car wash require a qualitative evaluation and comparison to retail land uses as defined in Council Policy 5-1. The proposed hotel and car wash project trip generation estimates are converted to an equivalent amount of retail square footage based on the daily trips. The resulting retail square footage is compared with the CEQA VMT Analysis Screening Criteria in the Transportation Handbook 2018 to determine conformance to Council Policy 5-1 for the proposed 116-room hotel and automated car wash.

1.3 LOCAL TRANSPORTATION ANALYSIS SCOPE

The project is subject to the City's Local Transportation Analysis (LTA) as specified in the Council Policy 5-1 and must comply with methodology included in the City's Transportation Analysis Handbook. The project's effects on transportation, access, circulation, and related safety elements in the proximate area of the project are evaluated. The traffic study provides near term impact analysis of the proposed project as required by the City. The analysis will address project impacts compared with the background no-project scenario.

Seven study intersections have been identified by Public Works staff, and the project's effects on the operation of these study intersections were evaluated under background conditions. Five of the study intersections are controlled by traffic signals, and the remaining two study intersections are two-way stop-controlled T-intersections, although both stop-controlled intersections are restricted to right turns only because of the raised median along Oakland Road.

The following intersections are included in the analysis:

Intersection	Control	Jurisdiction
1. Oakland Road & Mabury Road	Two-Way Stop Sign	San Jose
2. Oakland Road & US 101 NB	Signal	San Jose/Caltrans
3. Oakland Road & US 101 SB	Signal	San Jose/Caltrans
4. Oakland Road & Horning Street	Two-Way Stop Sign	San Jose
5. Oakland Road & Hedding Street	Signal	San Jose
6. 11th Street & Hedding Street	Signal	San Jose
7. 10th Street & Hedding Street	Signal	San Jose

The US 101 interchange study intersections are identified on the CMP network. They are outside of an Infill Opportunity Zone (IOZ).

The project site is designated as Combined Industrial/Commercial (CIC) in the City's Envision San Jose 2040 General Plan (February 2018). Hotel is a permitted use in CIC, and car wash is a conditional permit use. The project is consistent with the current General Plan; therefore, a General Plan Amendment (GPA) long-range transportation analysis is not required.

The project site is located south of the US 101 interchange at Oakland Road. The interchange is the subject of the City's adopted US 101/Oakland Road/Mabury Road Transportation Development Policy (TDP) which recognizes that the interchange is severely constrained and establishes a mitigation program for impacts to the US 101/Oakland Road interchange.

Two study intersections (Oakland Road/US 101 NB ramps and Oakland Road/US 101 SB ramps) are identified as Congestion Management Program (CMP) monitoring locations. An analysis based on the VTA CMP guidelines was not prepared since the proposed project generates less than 100 net new peak hour vehicle trips; however, the City's guidelines are intended to be consistent with the VTA Transportation Impact Analysis Guidelines, to promote consistency across jurisdictions within Santa Clara County.

The following scenarios are evaluated:

- Existing Scenario: Existing LOS
- Background Scenario: Existing + Approved Projects LOS
- Background Plus Project Scenario: Existing + Approved Projects + Proposed Project LOS

Project level of service and potential negative project effects are based on Highway Capacity Manual (HCM) delay methodology. **Table 1- 1** summarizes the correspondence between LOS and average vehicle delay. Traffix software is utilized to calculate the vehicle delay at the study intersections. An adverse effect on intersection operations occurs when the analysis demonstrates that the project causes the operations standard at a study intersection to fall below LOS D with the addition of project vehicle-trips to baseline conditions. For intersections already operating at LOS E or F under background conditions, the criteria for determining adverse intersection operations from the project impact is:

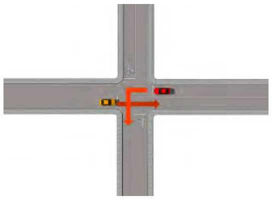
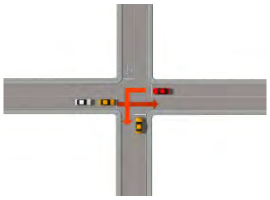
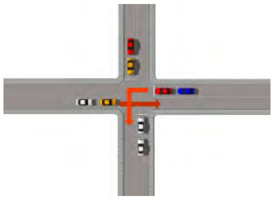
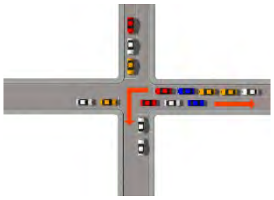
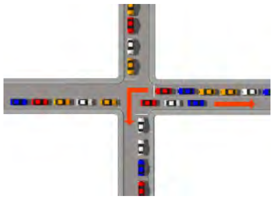
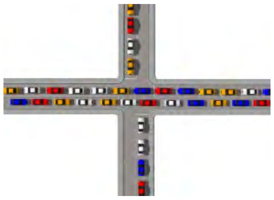
- An increase in average critical delay by 4.0 seconds or more AND an increase in the critical V/C ratio of 0.010 or more; OR
- A decrease in the average critical delay AND an increase in critical V/C ratio of 0.010 or more.

It should be noted that a potential adverse effect is not a CEQA measure.

1.4 REPORT ORGANIZATION

Chapter 2.0 of this report provides the transportation setting for the impact analysis, including existing roadway conditions, peak hour and daily traffic volumes, pedestrian, bicycle, and transit facilities, and traffic conditions field observations. Chapter 3.0 describes the CEQA conditions. Chapter 4.0 focuses on the LTA and potential traffic impacts of the proposed project under near term conditions, with project trip generation, distribution, and assignment presented in this chapter. Sections presenting additional site analyses and operational effects are included in Chapter 4.0. Chapter 5.0 summarizes the conclusions of the transportation analysis.

Table 1-1 Intersection Level of Service Ranges

Level of Service		Delay Description	Average Vehicle Delay	
			Signalized	Stop-Controlled
A		Minimal or no vehicle delay	0 – 10 seconds	0 – 10 seconds
B		Slight delay to vehicles	10.1 – 20 seconds	10.1 – 15 seconds
C		Moderate vehicle delays, traffic flow remains stable	20.1 – 35 seconds	15.1 – 25 seconds
D		More extensive delays at intersections	35.1 – 55 seconds	25.1 – 35 seconds
E		Long queues create lengthy delays	55.1 – 80 seconds	35.1 – 50 seconds
F		Severe delay and congestion	Above 80 seconds	Above 50 seconds

Source: Transportation Research Board, *Highway Capacity Manual 2010*, Exhibit 15-3

2.0 EXISTING TRANSPORTATION CONDITIONS

This chapter describes the transportation setting for the proposed project. The existing roadway network, intersection conditions, and existing traffic volumes are presented.

2.1 VEHICLE-MILES TRAVELED

From the Transportation Analysis Handbook, VMT is the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT is calculated using the Origin-Destination VMT method, which measures the full distance of personal motorized vehicle-trips with one end within the project. VMT that promotes the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses shall be used as a basis for determining significant transportation impacts in California to appropriately balance the needs of congestion management with statewide goals related to infill development, the promotion of public health through active transportation, and the reduction of greenhouse gas emissions.

The City uses an Excel-based VMT Evaluation Tool to evaluate whether proposed development projects would generate VMT impacts. The VMT for the half-mile radius surrounding the project site is based on the City's travel demand model and adjusted to the parcel level.

The City's VMT Evaluation Tool was used to determine the existing VMT for the study area. The VMT for the area is 15.43 per non-industrial worker. This is above the City's threshold of 12.22 per worker. The half-mile radius area around the project site includes residential developments and mostly industrial space. The VMT for the area is higher than the City's threshold since the workers in the area may not live in the surrounding residential developments and have to drive farther to home than the City's threshold.

Figure 2-1 illustrates the VMT per capita heat map for a one-half mile radius around the project site. This shows that the majority of the area surrounding the project site is classified as Regional Average VMT Areas.

2.2 ROADWAY NETWORK

The project is located on the west side of Oakland Road between Horning Road and Madera Avenue. Project traffic will access the local transportation network via Oakland Road, Hedding Street, and Horning Street. Regional access to the study area will be provided primarily by US 101. None of the streets in the study area are identified as a Vision Zero Priority Safety Corridor. The study area is identified as a Suburban with Multifamily Housing place type.

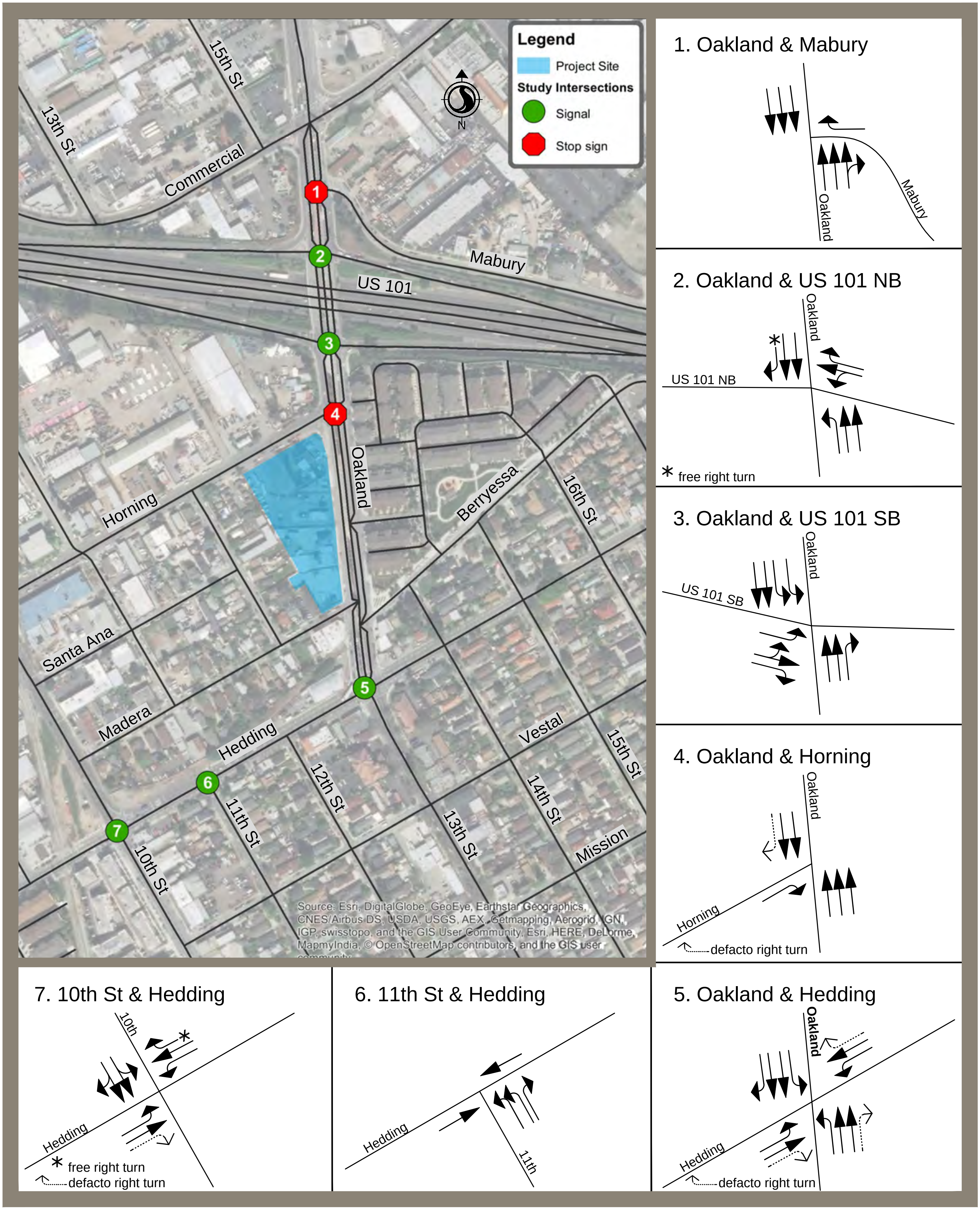
Figure 2-2 illustrates the surrounding street network and shows the existing lane configurations at the study intersections.

Oakland Road is a six-lane road north of the study area which narrows to five lanes for a short distance north of Commercial Street. South of Commercial Street, Oakland Road is a four-lane road with a raised median and left- and right-turn pockets at the US 101 interchange and at Hedding Street. The raised median restricts traffic at Mabury

Stantec

Figure 2-1

City of San Jose VMT per Job Heat Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 2-2

Study Area Street Network and Existing Intersection Lanes

Road, Horning Street, Madera Avenue, and Berryessa Road to right turns only. A median break at Boardwalk Way allows the southbound left-turn movement onto Boardwalk Way, but westbound traffic from Boardwalk Way onto Oakland Road is restricted to right turns only. South of the study area, Oakland Road becomes N. 13th Street south of Hedding Street. Oakland Road is classified on the City's General Plan Transportation Network as a City Connector Street north of US 101, a Main Street from US 101 to Jackson Street south of the study area, and a Local Connector Street south of Jackson Street. The speed limit on Oakland Road in the project vicinity is 40 mph north of US 101, 35 mph between US 101 and Hedding Street, and 25 mph south of Hedding Street. Signals are provided at US 101 northbound ramps, US 101 southbound ramps, and Hedding Street within the study area and at Commercial Street just north of the study area.

Hedding Street is a two-lane road in the project vicinity with a two-way left-turn painted median and turn pockets at the intersections. Hedding Street is classified as an On-Street Primary Bicycle Facility through the study area, Class II bike lanes are provided. On-street parking is prohibited. The speed limit on Hedding Street in the project vicinity is 30 mph west of Oakland Road and 35 mph east of Oakland Road. The intersections at 10th Street, 11th Street, and Oakland Road in the study area are signalized. Hedding Street crosses train tracks west of 10th Street. The at-grade crossing has flashing warning lights and automatic gates.

10th Street is classified as a City Connector Street north of Madera Avenue and a Local Connector Street south of Madera Avenue. 10th Street is a four-lane undivided street north of Hedding Street. South of Hedding Street, 10th Street is a wide one-way street southbound. The speed limit is 35 mph on 10th Street north of Hedding Street and 30 mph south of Hedding Street. Class II bike lanes are provided on 10th Street north of Hedding Street, but the striping is very faded in places. On-street parking is not allowed.

11th Street is a one-way street northbound that ends at Hedding Street. It is striped with two lanes that widens to three lanes at the intersection with Hedding Street. 11th Street is classified as a Local Connector Street. The speed limit on 11th Street is 30 mph. On-street parking is permitted, and a Class II bike lane is provided northbound.

Horning Street is not classified on the City's Transportation Network Diagram. Horning Street begins at 10th Street west of the project site and ends at Oakland Road. It is a wide two-lane street with no centerline stripe. The speed limit is 35 mph and on-street parking is allowed. Horning Street is controlled by a stop sign at the 10th Street and the Oakland Road intersections.

Madera Avenue is not classified on the City's Transportation Network Diagram. Madera Avenue also begins at 10th Street and ends at Oakland Road. Madera Avenue is a two-lane street with a 25-mph speed limit. On-street parking is allowed. Madera Avenue is controlled by a stop sign at the 10th Street and the Oakland Road intersections.

US 101 (Bayshore Freeway) provides regional access to the project vicinity. US 101 is an eight-lane freeway with six general purpose lanes and two high occupancy vehicle (HOV) lanes in the study area. A diamond interchange is provided at Oakland Road north of the project site. US 101 provides an interchange with I-880 approximately one-half mile west of the project study area and an interchange with I-280/I-680 approximately three miles southeast of the study area.

2.3 TRAFFIC VOLUMES

Peak hour intersection turning movement volumes at four of the seven study intersections were counted in September 2018 by All Traffic Data Services, and peak hour turning movement volumes at three study intersections and average daily traffic (ADT) volumes at seven mid-block locations were counted in July 2018 by NDS. The peak hour counts included pedestrians and bicycles. The mid-block counts included truck classification counts at three of the locations. Peak hour and ADT count data is included in **Appendix B**. The intersection counts that were collected in July 2018 were adjusted to match the September 2018 counts at the adjacent intersections.

The existing AM peak hour intersection turning movement volumes and mid-block ADT volumes are illustrated in **Figure 2-3**. Existing PM peak hour intersection turning movement volumes are illustrated in **Figure 2-4**.

Table 2-1 summarizes the delay and LOS for the study intersections under existing conditions (Traffix delay calculation worksheets are presented in **Appendix D**). This is provided for information only, since the project impacts are evaluated under background conditions presented later in the report (Chapter 4.0). The delay for the signalized intersections is based on the average delay for all movements, while the delay for the stop-controlled intersections is the delay on the approach controlled by the stop sign. As this table shows, the signalized intersections at the US 101 ramps are operating at LOS C or better during the AM and PM peak hours, and the signalized intersections along Hedding Street are operating at acceptable LOS D or better during the AM and PM peak hours. The stop-controlled intersection of Oakland Road and Mabury Road is operating at acceptable LOS C or better during the AM and PM peak hours, but the stop-controlled intersection of Oakland Road and Horning Street is operating at LOS E during the PM peak hour.

Table 2-1 Existing Delay and Level of Service Summary

		AM Peak Hour		PM Peak Hour	
Intersection	**Control**	**Delay**	**LOS**	**Delay**	**LOS**
1. Oakland & Mabury	Stop Sign	18.2 sec	C	12.7 sec	B
2. Oakland & US 101 NB [1]	Signal	33.4 sec	C	24.2 sec	C
3. Oakland & US 101 SB [1]	Signal	27.0 sec	C	29.4 sec	C
4. Oakland & Horning	Stop Sign	10.5 sec	B	**45.1 sec**	**E**
5. Oakland & Hedding	Signal	44.5 sec	D	43.4 sec	D
6. 11th St & Hedding	Signal	29.0 sec	C	15.9 sec	B
7. 10th St & Hedding	Signal	21.0 sec	C	37.5 sec	D

Notes:

[1] US 101/Oakland/Mabury TDP intersection and CMP intersection

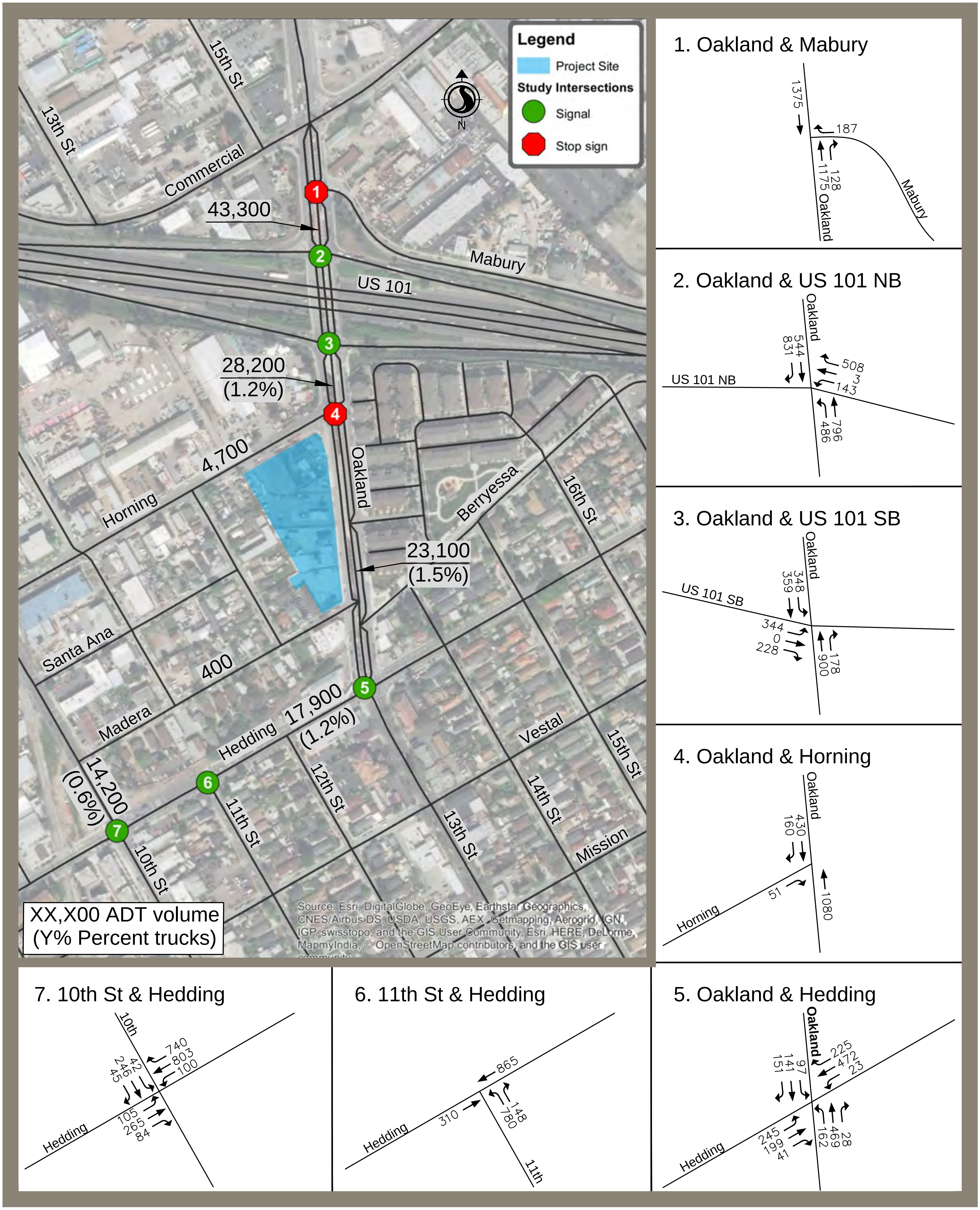
sec = Seconds of delay per vehicle

LOS = Level of service

▨ Highlight indicates LOS E or F

2.4 PEDESTRIAN AND BICYCLE FACILITIES

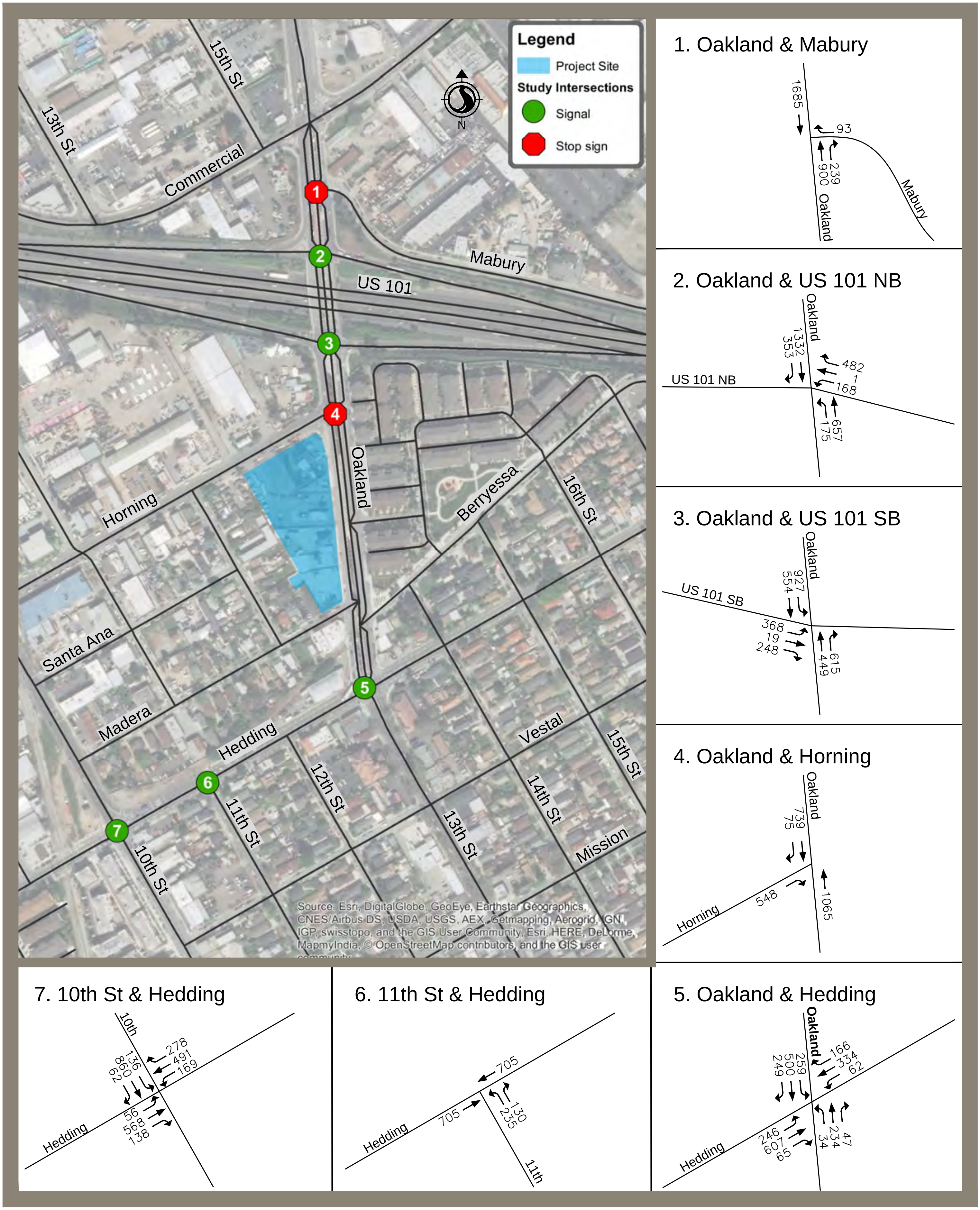
From the peak hour counts and field observations, pedestrian and bicycle traffic is light during the AM peak hour and moderate during the PM peak hour in the study area. Sidewalks are available and in acceptable condition along Oakland Road and Hedding Street in the study area, with the exception of the north side of Hedding Street between 11th Street and 10th Street where the sidewalk becomes a dirt path. Not all curb ramps along Oakland Road or



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 2-3

Existing AM Peak Hour Intersection Volumes



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Stantec

Figure 2-4

Existing PM Peak Hour Intersection Volumes

Hedding Street are ADA-compliant. A sidewalk is provided on the east side of 10th Street north of Hedding Street but does not exist on the west side. Sidewalks are provided on both sides of 10th Street south of Hedding Street, on 11th Street south of Hedding Street, and on Madera Avenue. Sidewalks are missing on portions of Horning Street.

Class II bike lanes are provided on Oakland Road north of Commercial Street and south of Boardwalk Way, but they are not carried through the US 101 interchange area. Santa Clara Valley Transportation Authority (VTA) rates Oakland Road between Hedding Street and US 101 as a “High Caution” area on the Santa Clara Valley Bikeways Map which indicates high traffic volumes, high traffic speeds, high number of vehicles turning right, and narrow travel area for bicycles. Class II bike lanes are provided on Hedding Street which is designated as an On-Street Primary Bicycle Facility. Class II bike lanes are provided in both directions on 10th Street north of Hedding Street but are not striped on the one-way portion of 10th Street south of Hedding Street, although “Bike Lane” signs are posted. Northbound Class II bike lanes are striped on 11th Street south of Hedding Street. All of the bike facilities are in good repair, with the exception of 10th Street north of Hedding Street where the bike lane striping is badly faded in some places.

There are no designated bike facilities on Horning Street or Madera Avenue.

Figure 2-5 illustrates the bike facilities in the project vicinity.

Planned improvements at the US-101/Oakland Road interchange include widening of the bridge deck to accommodate an additional lane over the freeway. The deck widening will also include additional width for bike lanes and sidewalks along Oakland Road.

2.5 TRANSIT FACILITIES AND SERVICES

Several local and express bus routes are located in the study area.

VTA provides local and community bus routes along Oakland Road and Hedding Street and two express routes along US 101 in the study area. Route 66 travels along Oakland Road from north of Commercial Street to Hedding Street with bus stops on Oakland Road adjacent to the project site. Route 66 continues west along Hedding Street past 10th Street. Route 65 travels from the Oakland Road/Hedding Street intersection south along 13th Street south of the study area. Route 12 travels from the Civic Center area west of the study area to east of the study area along Hedding Street. Similarly, Route 62 travels from west of the study area to east of the study area via Hedding Street. Bus stops are located along Hedding Street in the study area.

VTA provides express Route 121 and Route 122 through the study area via US 101; however, bus stops for these routes are not provided in the study area.

Monterey-Salinas Transit (MST) provides an Amtrak thruway bus route that travels between Mineta San Jose International Airport and King City to the south. MST Route 86 travels through the study area via US 101 and does not provide any bus stops in the study area.

Figure 2-6 illustrates the transit routes in the study area.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 2-5

Bicycle Facilities in the Study Area

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

\\us0312-ppfss01\workgroup\2042\active\222310633\design\traffic\rpt_dwgs\carwash_hotel-rpt_dwgs.dwg

Figure 2-6

Transit Facilities in the Study Area

2.6 OBSERVED TRANSPORTATION CONDITIONS

Traffic conditions in the field were observed during the AM peak period (beginning 8 AM) on Tuesday July 24, 2018 and during the PM peak period (beginning 4 PM) on Monday July 23, 2018 by Stantec staff.

During the AM peak period, there was mild traffic observed at Mabury Road and at US 101 northbound on-ramp. Mild pedestrian traffic on Oakland Road. No congestion was observed at the intersection of Oakland Road and Hedding Street. Similarly, along Hedding Street very little congestion was observed between Oakland Road and 10th Street. Few pedestrians or bicyclists were observed during the AM peak period along Hedding Street.

During the PM peak period, congestion observed at 10th Street and 11th Street caused eastbound traffic on Hedding Street to back up past 7th Street. A moderate amount of pedestrian traffic was observed along Hedding Street. Considerable traffic turning left onto Oakland Road from eastbound Hedding Street caused congestion at the intersection of Oakland Road and Hedding Street. The ramp meter at the US 101 southbound on-ramp from Oakland Road backs traffic approximately 250 feet from the meter to Oakland Road, but vehicles do not spill out onto Oakland Road. Moderate traffic was observed at Mabury Road due to vehicles backing up from the Commercial Street intersection. Southbound on Oakland Road, traffic backs up from the US 101 northbound on-ramp ramp meter to Oakland Road and causes moderate impact on the intersection at Commercial Street.

3.0 CEQA TRANSPORTATION ANALYSIS

City staff has confirmed that the project is exempt from a detailed CEQA VMT analysis since it is equivalent to less than 100,000 square foot retail development based on the trip generation. Similar to local-serving retail trips, the proposed hotel and car wash trips would typically redistribute existing trips instead of creating new trips. The project trips may shorten vehicle-trips and reduce VMT by diverting existing trips from established locations to the new hotel and car wash without measurably increasing trips outside the local area.

3.1 VEHICLE-MILES TRAVELED ANALYSIS

The City has developed screening criteria to determine when a detailed CEQA transportation analysis would not be required. A detailed CEQA transportation analysis is not required if a project meets the City's screening criteria. Projects that are expected to result in less-than-significant VMT impacts based on project description, characteristics, or location would not require a detailed CEQA transportation analysis.

The City has defined "Local-Serving Retail" as a type of project that will not result in significant transportation impacts on the transportation system and will conform to the City's General Plan and other City goals and policies. As defined in Council Policy 5-1, local-serving retail typically diverts existing trips from established local retail to new local retail without measurably increasing trips outside of the area. In recognition of this effect, retail commercial projects up to a combined total of 100,000 gross square feet meet the City's screening criteria and do not require a detailed VMT analysis.

A 100,000 square foot retail project would generate 3,775 daily trips based on Institute of Transportation Engineers (ITE) trip rate. The proposed project generates 1,429 daily baseline vehicle-trips (discussed in Chapter 4.0, Section 4.4.1). The project is equivalent to 38,000 square feet of local-serving retail based on the project's daily baseline vehicle trip total; therefore, the project is less than the criteria of 100,000 square feet of retail and is exempt from a detailed VMT analysis.

To demonstrate the local serving nature of the proposed project, **Figure 3-1** illustrates the locations of hotels proximate to the project site. This figure shows the project's proximity to the Mineta San Jose Airport. Also in the general vicinity are the Civic Center and Downtown San Jose. The hotel component of the project will be oriented toward business travelers. Many of the proposed hotel's visitors will choose this hotel for its location within two miles of the airport as well as its proximity to the Civic Center or Downtown San Jose (i.e., less than two miles). It is presumed that the majority of hotel customers would divert trips to the proposed hotel from other existing local hotels and, therefore, would not generate new hotel trips in the region.

Figure 3-2 illustrates the locations of car wash facilities proximate to the project. The project site is surrounded by several existing car wash facilities, either at gas stations or stand-alone. Motorists will choose a car wash that is convenient rather than drive miles out of their way to a car wash. If the proposed car wash is more convenient than an existing car wash, then motorists divert existing car wash trips to the proposed car wash. Furthermore, the majority of car wash trips would be pass-by or diverted trips where the motorist stops at the car wash on their way to another destination.

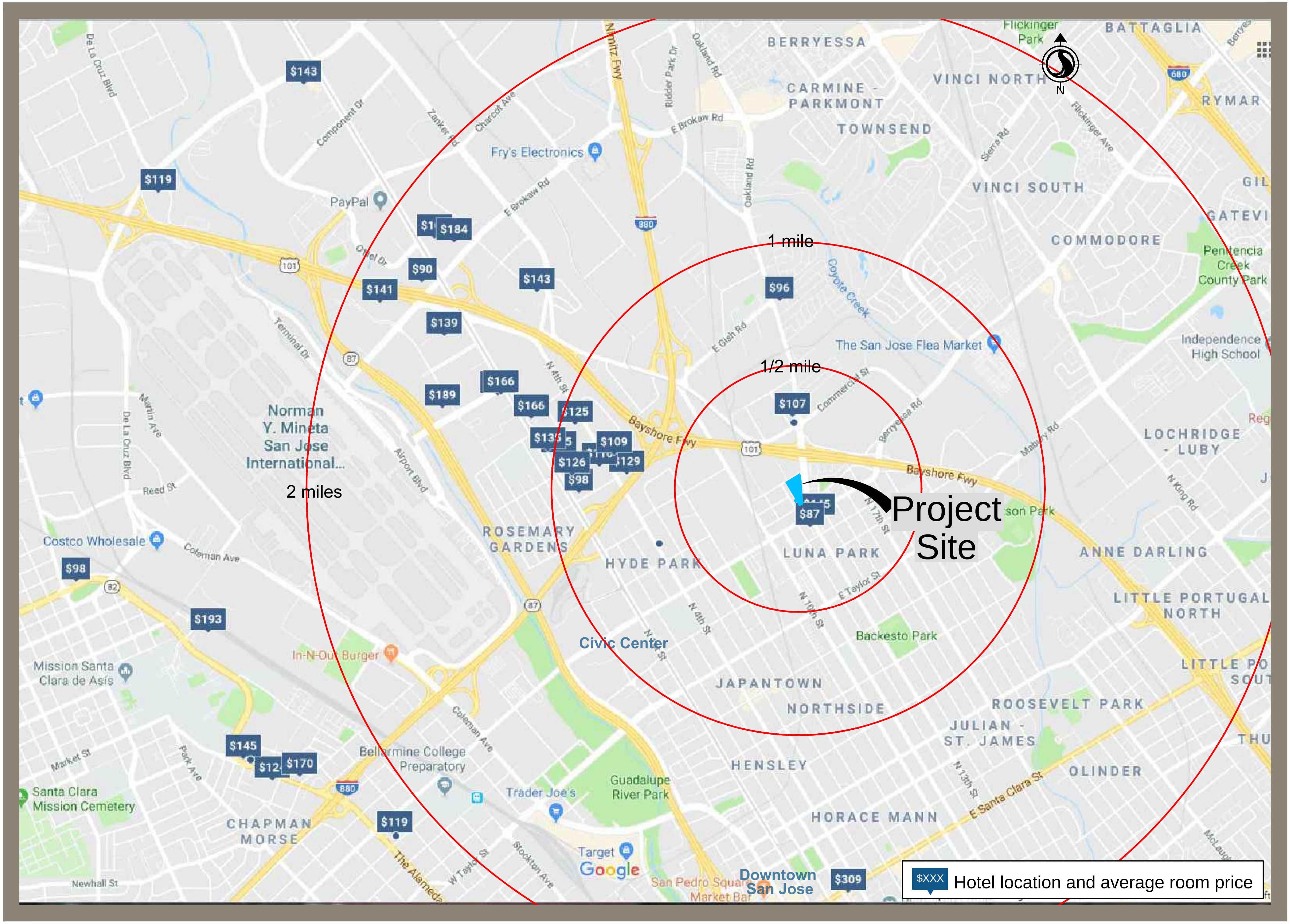


Figure 3-1

Hotel Locations in the Vicinity of the Project Site

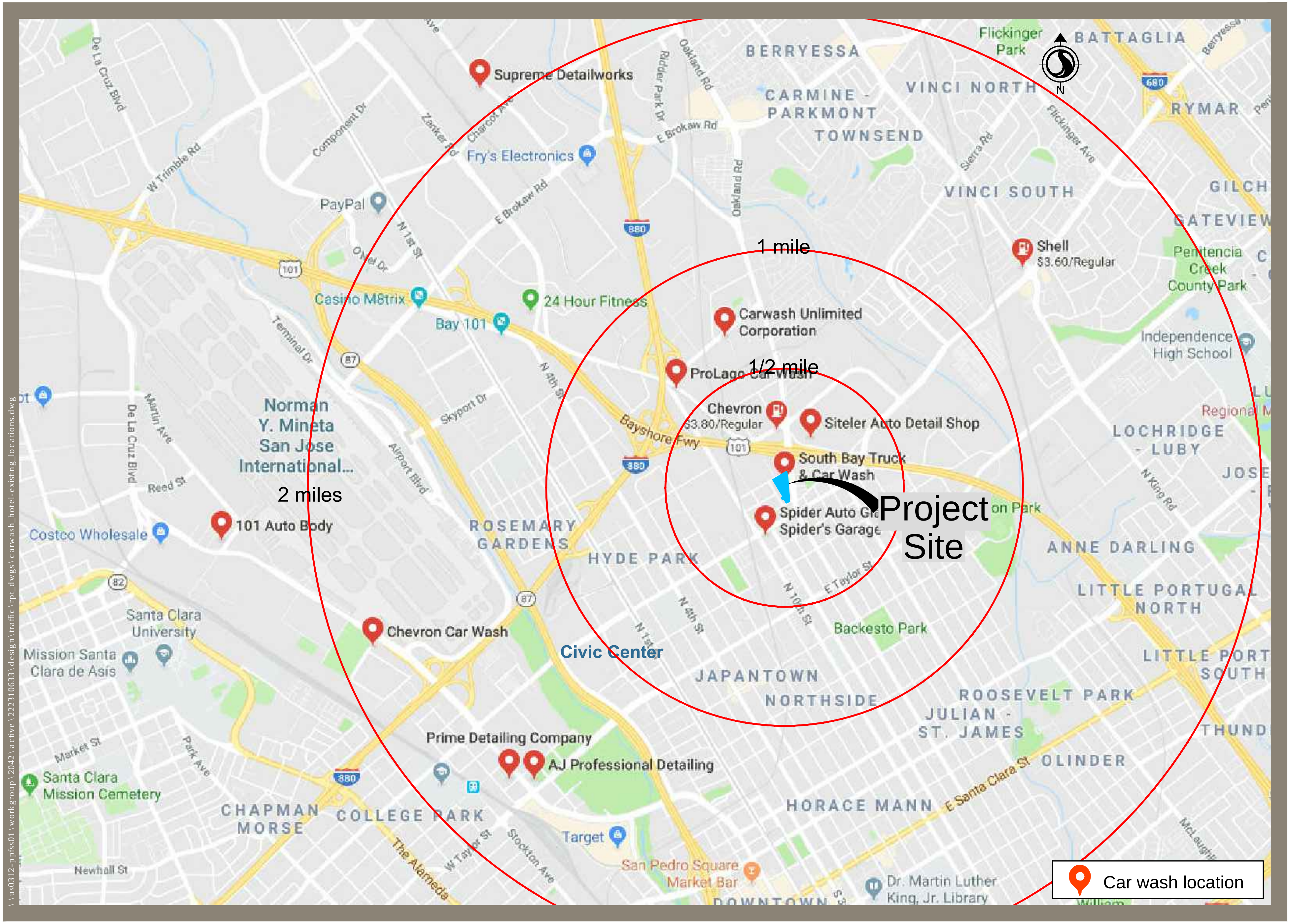


Figure 3-2

Car Wash Locations in the Vicinity of the Project Site

Per San Diego Association of Governments (SANDAG) *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, the weighted average hotel trip length of all trips, including guests and staff, is 7.6 miles. A gas station has a weighted average trip length, including customers and staff, of 2.8 miles, and the proposed car wash would have a similar average trip length. Both of these land uses have much shorter average trip lengths than the VMT for the area of 15.43 per non-industrial worker; therefore, the project would reduce the overall VMT for the area.

The proposed project is in conformance with Council Policy 5-1.

3.2 OTHER JURISDICTIONS

The project is adjacent to US 101 freeway. The Oakland Road/US 101 interchange ramps are under Caltrans jurisdiction and are included in the list of study intersections. The study area is completely within the City of San Jose, and no other City's intersections or roadways are analyzed.

3.2.1 Methodology

Study intersections at the US 101/Oakland Road interchange are under Caltrans jurisdiction. Caltrans uses HCM delay methodology to determine peak hour impacts at ramp intersections. Caltrans analysis methodology is consistent with the HCM analysis that the City uses in the LTA.

The project adds less than 100 trips to the freeway; therefore, a mainline freeway analysis is not performed.

3.2.2 Significance Criteria

The significance criteria that the City uses was applied to the Oakland Road/US 101 ramp intersections to determine impacts to Caltrans intersections.

3.2.3 Project Impacts and Mitigation Measures

Project impacts to the Oakland Road/US 101 ramp intersections are discussed in the following chapter.

4.0 LOCAL TRANSPORTATION ANALYSIS

This chapter addresses the potential project impacts based on the City's local transportation analysis (LTA), and identifies significant project impacts, if any, based on the methodology in the City's Transportation Analysis Handbook.

4.1 BICYCLE AND PEDESTRIAN

The project is not expected to generate a significant amount of pedestrian or bicycle traffic. Business hotel guests are expected to use rental cars, ride-sharing services (i.e., Uber/Lyft), or hotel shuttle services (if provided); however, a portion of hotel employees might walk or bike to the site. Car wash customers will drive their vehicle to the car wash site. The automated car wash will have a minimal number of employees who might walk or bike to the site. The project is not expected to have a noticeable effect on the pedestrian or bicycle network.

4.2 TRANSIT

As discussed below, the project is located within a Suburban with Multifamily Housing area. There is a bus route that travels along the project frontage and several that travel along Hedding Street south of the site; however, there is a low percentage of transit use expected. Business hotel guests are more likely to use the hotel's airport shuttle (if provided) or ride-sharing services such as Uber or Lyft than to take public transit to and from the hotel. Customers of the car wash will drive their personal car to the site. The most common users of transit to the site will be employees of the hotel or car wash. However, the project is not expected to have a noticeable effect on transit use in the study area.

4.3 TRANSPORTATION DEMAND MANAGEMENT

A transportation demand management plan will be prepared for the project site.

4.4 INTERSECTION OPERATION ANALYSIS

The LTA is based on the peak hour analysis of seven study intersections. The analysis examines the project's impacts based on the HCM delay methodology. Conditions with the proposed project are compared with background conditions to determine significant project impacts.

4.4.1 Trip Generation

The project site is currently developed with several businesses, mostly automobile related such as a tire shop, auto and truck hand wash, print shop for car wraps, propane sales, etc., and one single-family residence. These businesses are currently generating traffic that is included in the existing intersection turning movement counts. The site currently has approximately 10 employees, which can vary depending on the weather (auto/truck hand wash).

The proposed project is comprised of two components, a 116-room business hotel and an automated car wash. **Table 4-1** summarizes the daily total trip generation for the proposed project and during the weekday AM and PM peak hours.

Table 4-1 Project Trip Generation Summary

			AM Peak Hour			**PM Peak Hour**			
Land Use	**ITE Category**	**Units**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**ADT**
Trip Rates [1]									
Business Hotel	312	Rooms	.16	.23	.39	.18	.14	.32	4.02
Automated Car Wash	948	Tunnels	*	*	*	38.75	38.75	77.50	*
Trip Generation									
Business Hotel		116 Rooms	19	26	45	20	17	37	466
Automated Car Wash		1 Tunnel	28	21	49	39	39	78	963
Baseline Vehicle Trips			47	47	94	59	56	115	1,429
Project Trip Reduction									
1. Hotel Location-Based Adjustment [2]			-2	-3	-5	-2	-2	-4	-56
Adjusted Vehicle Trips - Sub-Total			45	44	89	57	54	111	1,373
3. Existing Site Traffic [3]			-30	-12	-42	-22	-27	-49	-650
Net External Vehicle Trips			15	32	45	35	27	62	723

* Source: Case study – comparable automated car wash site in Montebello, CA (Los Angeles County)
Notes:
[1] *Trip Generation Manual, 10th Edition,* Institute of Transportation Engineers
[2] Suburban with Multifamily Housing: 88%
[3] Driveway counts collected July 2018

Trips generated by the project were estimated based on land use-based trip rates. Estimates of project trips are generally calculated based on average trip rates per a known variable, such as square feet for office or retail uses or dwelling units for residential developments. The Institute of Transportation Engineers (ITE) publishes a comprehensive manual with trip rates for hundreds of specific land use categories based on decades of data collected in the field. ITE's *Trip Generation Manual* is the industry standard for determining trip generation for developments.

Hotel

Daily and peak hour trip generation rates for the proposed hotel were obtained from ITE's *Trip Generation Manual, 10th Edition* trip rates for Business Hotel (Category 312). These trip rates are based on the number of guest rooms of the proposed business hotel. The hotel component of the proposed project will generate approximately 466 daily vehicle trips, 45 AM peak hour vehicle trips, and 37 PM peak hour vehicle trips.

Car Wash

As thorough as ITE's *Trip Generation Manual* is, there are categories of land uses with little or no trip rate data. The proposed automated car wash is one such category (Category 948). The *Trip Generation Manual* contains trip rates for weekday PM peak hour, but no data is available for daily or AM peak hour trips. In the absence of viable published trip rates, case study data is used. A case study of an existing car wash with identical layout and operating characteristics in Los Angeles County was used to determine the AM and daily trips for the proposed car wash. The car wash used in the case study is located in Montebello on the corner of Montebello Boulevard and Washington Boulevard. This case study car wash has been in operation since 2013, and the counts were collected in 2014. The hours of operation are 7 AM to 7 PM except during the summer when they are open until 8 PM. Information on the number of staff at the time of the counts is not available. The car wash component of the project is estimated to generate 49 AM peak hour trips, 78 PM peak hour trips, and 963 daily trips. The peak hour and daily trip count data for the car wash site case study is provided in **Appendix F.**

The peak hour and daily trips being used for the analysis were compared with the trips that the car wash would generate if SANDAG trip rates for Car Wash – Automatic from the *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002) were applied to the project. Compared with SANDAG trip rates, the project trip generation used in this analysis is 13 trips higher during the AM peak hour, 4 trips lower during the PM peak hour, and 63 trips higher daily. The trips used in this analysis are conservatively high during the AM peak hour and daily, and approximately equivalent during the PM peak hour. A comparison summary of the car wash trips is included in **Appendix F**.

The project's baseline vehicle trip total is 1,429 daily trips, of which 94 occur during the AM peak hour and 115 occur during the PM peak hour.

Trip Generation Reduction Factors

Trip generation reduction factors applied to the baseline project trip generation total are discussed below.

Internal Capture

The proposed project's land use combination of business hotel and automated car wash is forecasted to have nominal to no internal capture trips; therefore, no internal adjustment was made to the project trip generation estimate.

Location Based Adjustment

The project site location meets the description of a Suburban with Multifamily Housing area defined by the VMT Tool. The Transportation Analysis Handbook specifies 88 percent vehicle mode share for "Suburban with Multifamily Housing" area. Therefore, 12 percent of estimated business hotel project trip generation have been decreased per location-based adjustment. No adjustment credit for project site location transit was applied to the proposed car wash portion of the project trip generation because the nature of the self-serve car wash business would only draw patronage via consumers driving their own vehicles. The total Suburban with Multifamily Housing area reduction is 5 vehicle trips during the AM peak hour, 4 vehicle trips during the PM peak hour, and 61 daily vehicle trips.

The proposed business hotel will most likely operate a shuttle service between the hotel and Mineta San Jose International Airport. However, without a known hotel operator with a commitment to provide free shuttle service, no reduction in the project trip generation for shuttle trips was assumed for the proposed hotel.

Existing Site Traffic

The project site is currently developed with several automobile-related businesses. These businesses are currently generating traffic that is included in the existing intersection turning movement counts. Stantec conducted peak hour driveway counts at all ten of the existing project site driveways during AM and PM peak hours to determine existing trip generation from the site. Counts conducted at the driveways have been deducted from the proposed AM and PM peak hour trip estimates to calculate the net new trips from the proposed project. The total for the existing uses might be slightly low since the driveway counts do not include any site traffic that may have parked on the street adjacent to the site.

The average daily traffic estimate of the existing site was calculated by interpolating the collected AM and PM peak hour volume data. SANDAG rates specify that a car wash land use generates approximately 4 percent of its daily trips during the AM peak hour and 9 percent during the PM peak hour. Similarly, the SANDAG rates estimate that a hotel land use generates 6 percent of total daily trips during the AM peak hour and 8 percent during the PM peak hour. Using the hotel land use’s more conservative peak hour traffic to daily traffic ratio of 14:100 compared to the car wash’s ratio of 13:100, the sum of existing site’s AM and PM peak hour trips have been divided by 14 percent to interpolate the estimated total daily traffic. The collected existing driveway count data is provided in **Appendix B**. The existing land uses on the project site currently generate 42 AM peak hour trips, 49 PM peak hour trips, and approximately 650 daily trips.

It is generally preferable to collect actual count data for existing uses rather than calculate the trips based on trip rates, especially when some of the existing businesses on the site do not easily fall into the ITE categories. However, an estimate of existing trips based on ITE trip rates was prepared assuming Car Wash and Detail Center (ITE 949) and Auto Care Center (ITE 942) land uses for comparison. The actual counted driveway total was compared with the ITE trip rate estimate and is summarized in **Appendix F**. The actual counted driveway total is lower than the ITE trip estimate during the peak hours, with the actual counted driveway total 10 trips lower than the ITE trip estimate during the AM peak hour and 35 trips lower during the PM peak hour. This results in a conservatively high net external project vehicle trip estimate.

Net External Vehicle Trips

With the reductions for Urban Low-Transit area and existing development on-site, the proposed project will generate 45 new vehicle trips during the AM peak hour, 62 new vehicle trips during the PM peak hour, and 723 new vehicle trips daily. This trip generation estimate is conservatively high since a pass-by reduction for the car wash, which would be significant, was not taken.

4.4.2 Project Trip Distribution

Project trips were distributed and assigned to the surrounding streets manually. Separate distribution estimates were developed for the business hotel and the car wash. These distribution estimates were developed using engineering judgement based on levels and locations of development and locations of other existing hotels and car washes in relation to the location of the project site. Trips to and from the business hotel are more likely to be distributed to the airport, Civic Center, and Downtown San Jose areas than the car wash, which is more likely to draw traffic from the surrounding residential and business areas.

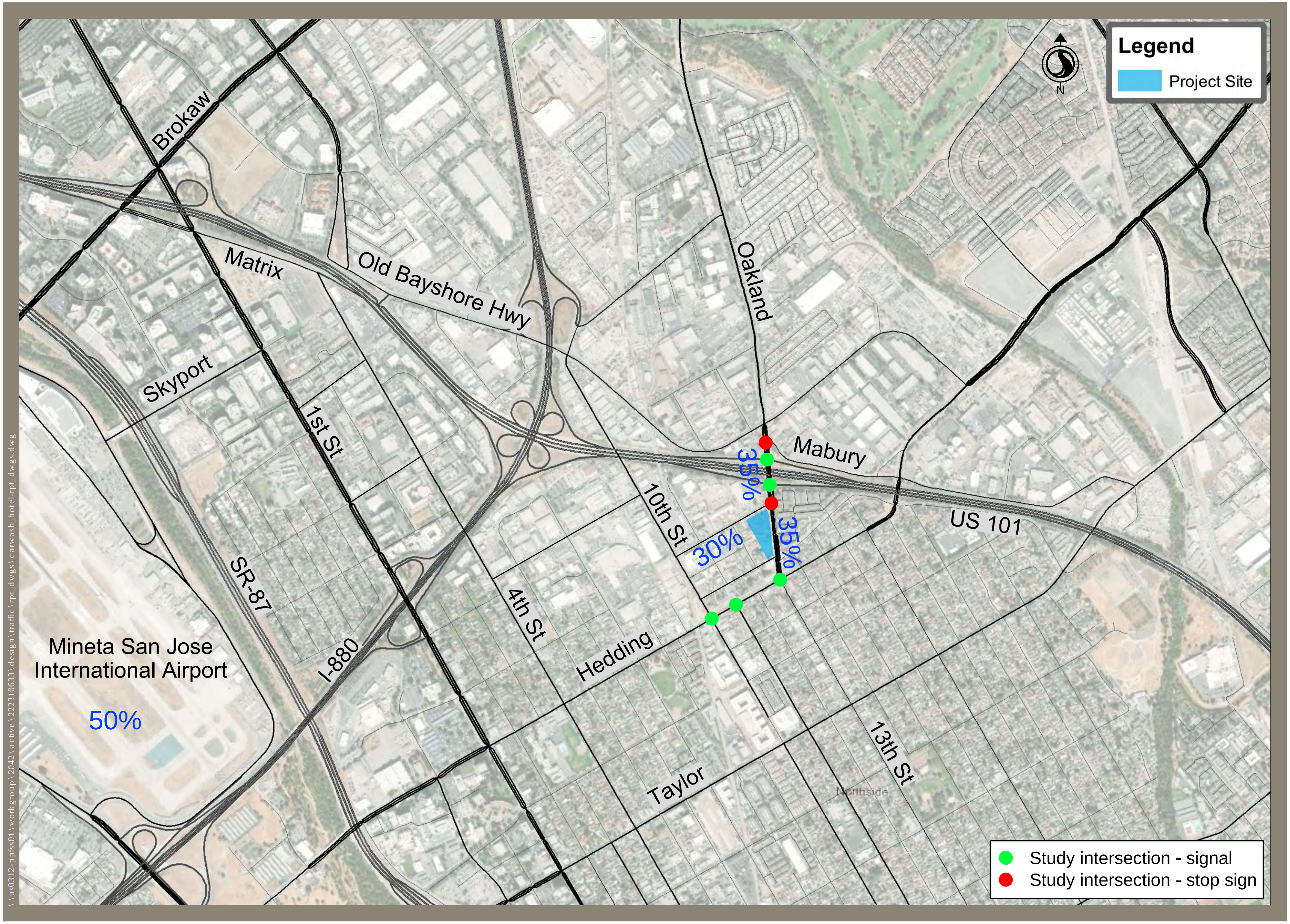
Figure 4-1 illustrates the business hotel general distribution. As this figure shows, the Mineta San Jose International Airport, approximately 2.5 miles from the project site, is estimated to attract approximately 50 percent of the business hotel traffic. The most direct route to the project site from the airport might be via US 101; however, congestion on US 101 during the peak hours would discourage many hotel guests from taking that route. With smartphone apps providing driving directions based on real-time traffic conditions, there are alternative routes using the local streets to and from the airport which would provide a competitive drive time between the hotel and airport. These alternate routes were assumed to be along 10th Street, 4th Street, and 1st Street via Horning Street or Hedding Street, with a small amount of business hotel traffic using I-880 to access the south end of the airport via Airport Boulevard. Approximately 22.5 percent of non-airport traffic is distributed to the I-880 and US 101 freeways, 2.5 percent to Oakland Road north of US 101, 10 percent to Hedding Street east of US 101, 5 percent south of Hedding Street, and 10 percent to Hedding Street west of 1st Street.

Figure 4-2 illustrates the car wash distribution. The car wash will attract customers more locally from the surrounding residential and commercial areas. Approximately 10 percent is distributed to Oakland Road north of US 101, 10 percent is distributed to Hedding Street east of US 101, 40 percent is distributed south of Hedding Street, 10 percent is distributed to Hedding Street west of 4th Street, and 30 percent is distributed northwest of the project site along 10th Street via Horning Street. The same distribution was assumed for existing site traffic since existing uses are auto-related retail businesses.

4.4.3 Project Trip Assignment

The peak hour project trips identified in Section 4.4.1 were assigned to the surrounding roadway network according to the general hotel and car wash distribution presented in the previous Section. Turn restrictions and one-way streets were taken into consideration when assigning the peak hour project trips to the study intersection turning movements. The peak hour business hotel intersection turning movement trips and the car wash intersection turning movement trips were added together, and the existing site peak hour intersection turning movement trips were subtracted from the business hotel and car wash total to produce the net intersection turning movement trips generated by the proposed project.

Figure 4-3 illustrates the net AM peak hour vehicle trips at the study intersections, and **Figure 4-4** illustrates the net PM peak hour vehicle trips for the project site (individual business hotel, automated car wash, and existing site peak hour intersection turning movement trips are provided in **Appendix G**). The project driveway volumes in these exhitbits represent the total adjusted vehicle trips generated by the proposed project, while the off-site study intersection volumes show the net external vehicle trips (i.e., new project trips less the existing site trips).



\\us0312-ppfss01\workgroup\2042\active\222310633\design\traffic\rpt_dwgs\carwash_hotel-rpt_dwgs.dwg

Stantec

Figure 4-1

General Project Distribution - Business Hotel

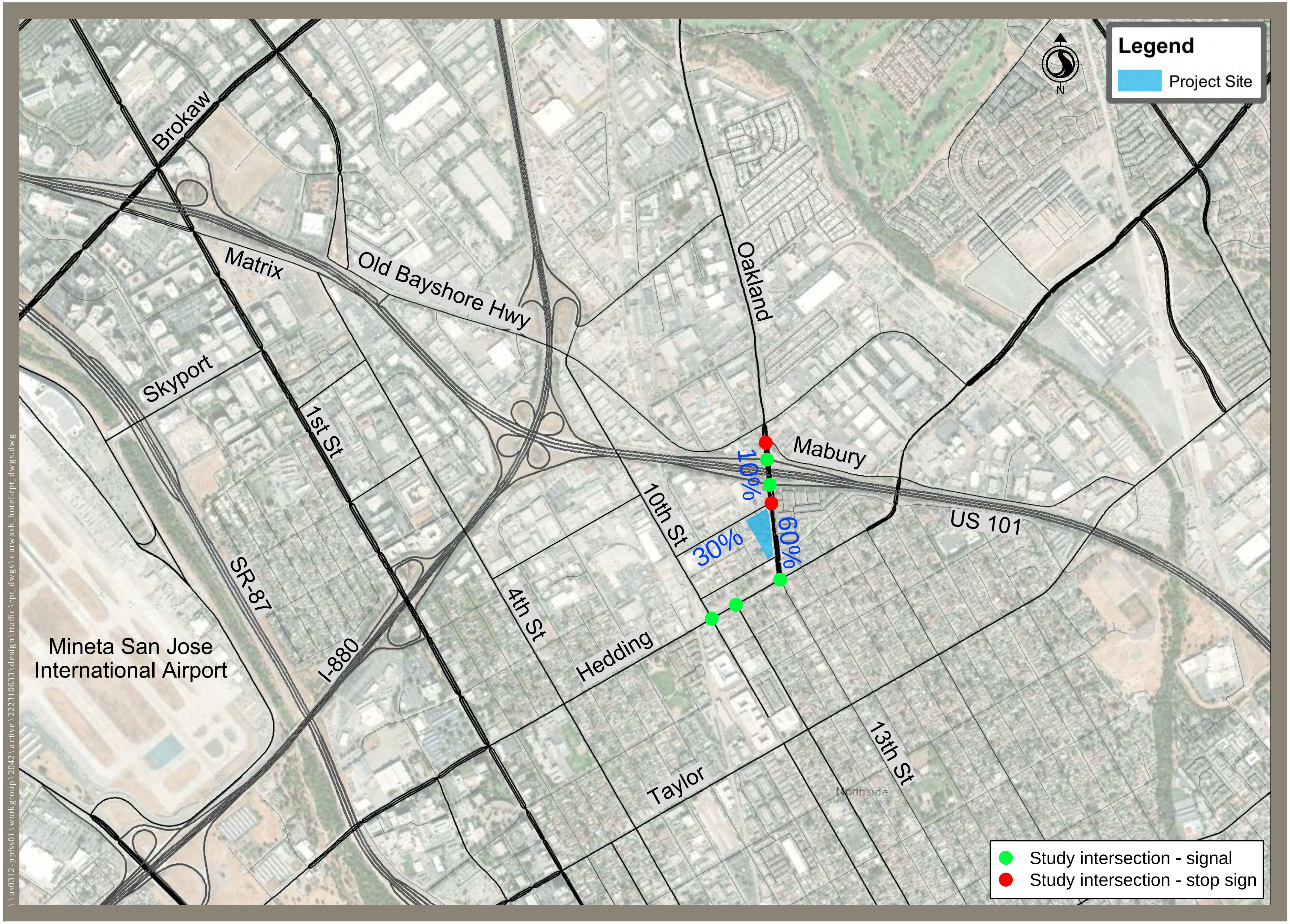
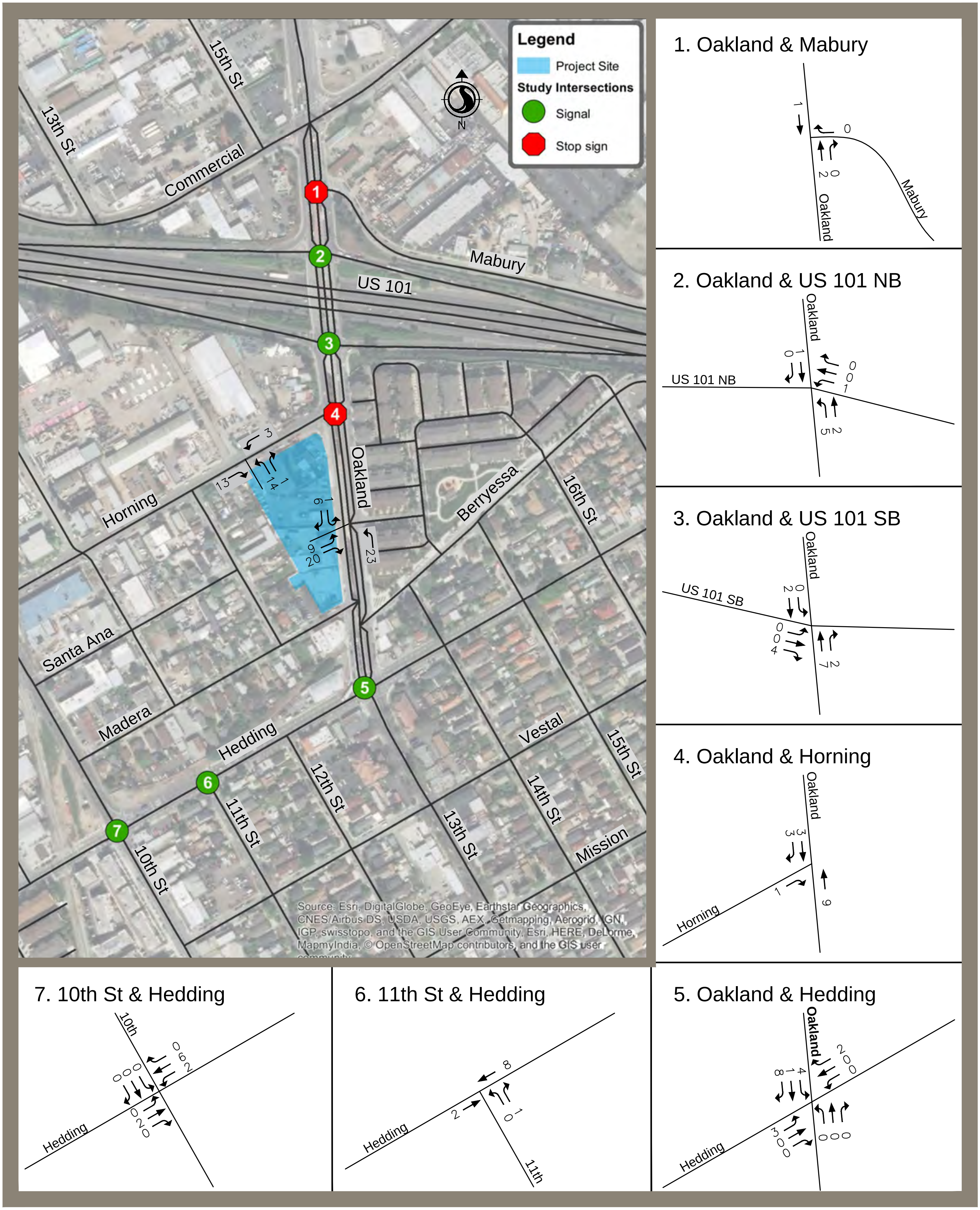


Figure 4-2

General Project Distribution - Carwash



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 4-3

Net Project AM Peak Hour Trips

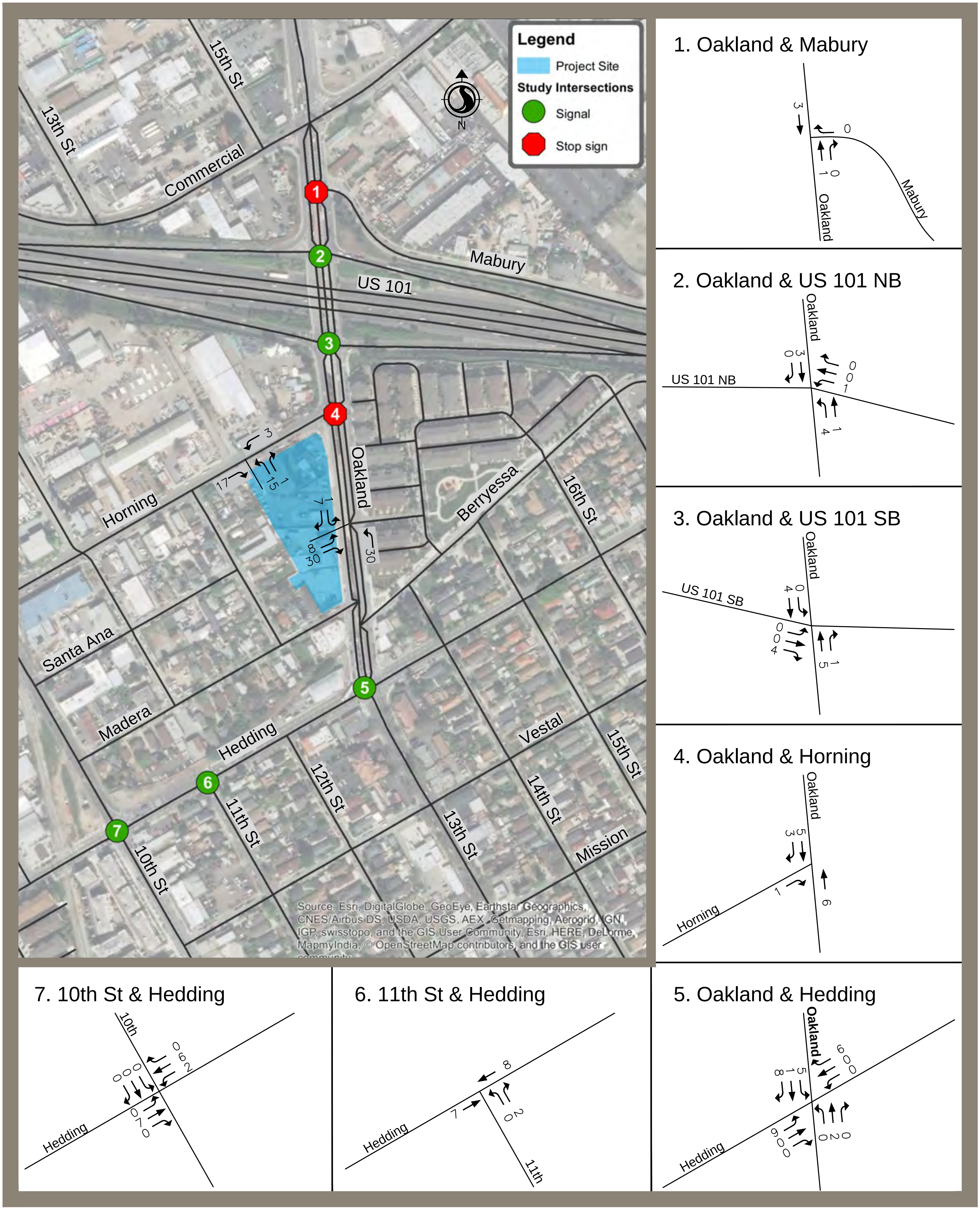


Figure 4-4

Net Project PM Peak Hour Trips

US-101 Oakland/Mabury TDP

The City adopted the US-101/Oakland/Mabury Transportation Development Policy (TDP) in 2007 which "is intended to achieve all of the following: (1) management of traffic congestion generated by near-term new development in the vicinity of the US-101/Oakland interchange; (2) promotion of General Plan goals for economic development and housing; and (3) improvement of the US-101/Oakland Road interchange and construction of the new US-101/Mabury Road interchange to accommodate new development." The TDP defines the interchange capacity available, identifies the required improvements for future development in the area, explains the funding to complete the required improvements, establishes a traffic fee program for new development in the area to fund the improvements, promotes industrial land use in the area, and allows the LOS of signalized intersections covered by the TDP to temporarily exceed the City's LOS standards until the required improvements are constructed.

Future intersection impacts caused by future developments are expected to occur at US 101 northbound/Oakland Road ramps, US 101 southbound/Oakland Road ramps, and Oakland Road/Commercial Road intersection. Major regional transportation projects that are recognized as necessary to provide adequate access to the US 101 freeway and the planned BART station include modification of the US 101/Oakland Road interchange and construction of the US 101/Mabury Road interchange. The proposed project adds traffic to the "Policy Interchange Intersections" of US 101 northbound/Oakland Road ramps and US 101 southbound/Oakland Road ramps.

The TDP established PM peak hour vehicle trips as the measurement for interchange capacity impacts. Any trip traversing through one or more Policy Interchange Intersection during the PM peak hour is regarded as one interchange trip, whether they access the US 101 freeway or not. Construction of the Planned Improvements will increase the interchange capacity, making approximately 1,153 PM peak hour trips available to accommodate new development. **Figure 4-5** illustrates the Planned Improvements.

Various funding sources for the Planned Improvements are identified in the TDP. The City Council established a Traffic Impact Fee program to cover the unfunded cost of the Planned Improvements. The Traffic Impact Fee program requires new development that adds traffic to the Policy Interchange Intersections to make a fair share financial contribution to the cost of the Planned Improvements. The Traffic Impact Fee for each interchange PM peak hour trip for fiscal year 2019 is $38,623.

The TDP and its Traffic Impact Fee program applies to all new residential and commercial development that generates vehicular trips at any of the Policy Interchange Intersections. Based on the trip distribution and assignment, the project adds 14 PM peak hour trips to the Oakland Road/US 101 interchange. This volume of project trips could be reduced if the business hotel were to provide a shuttle service for guests to and from destinations such as the airport.

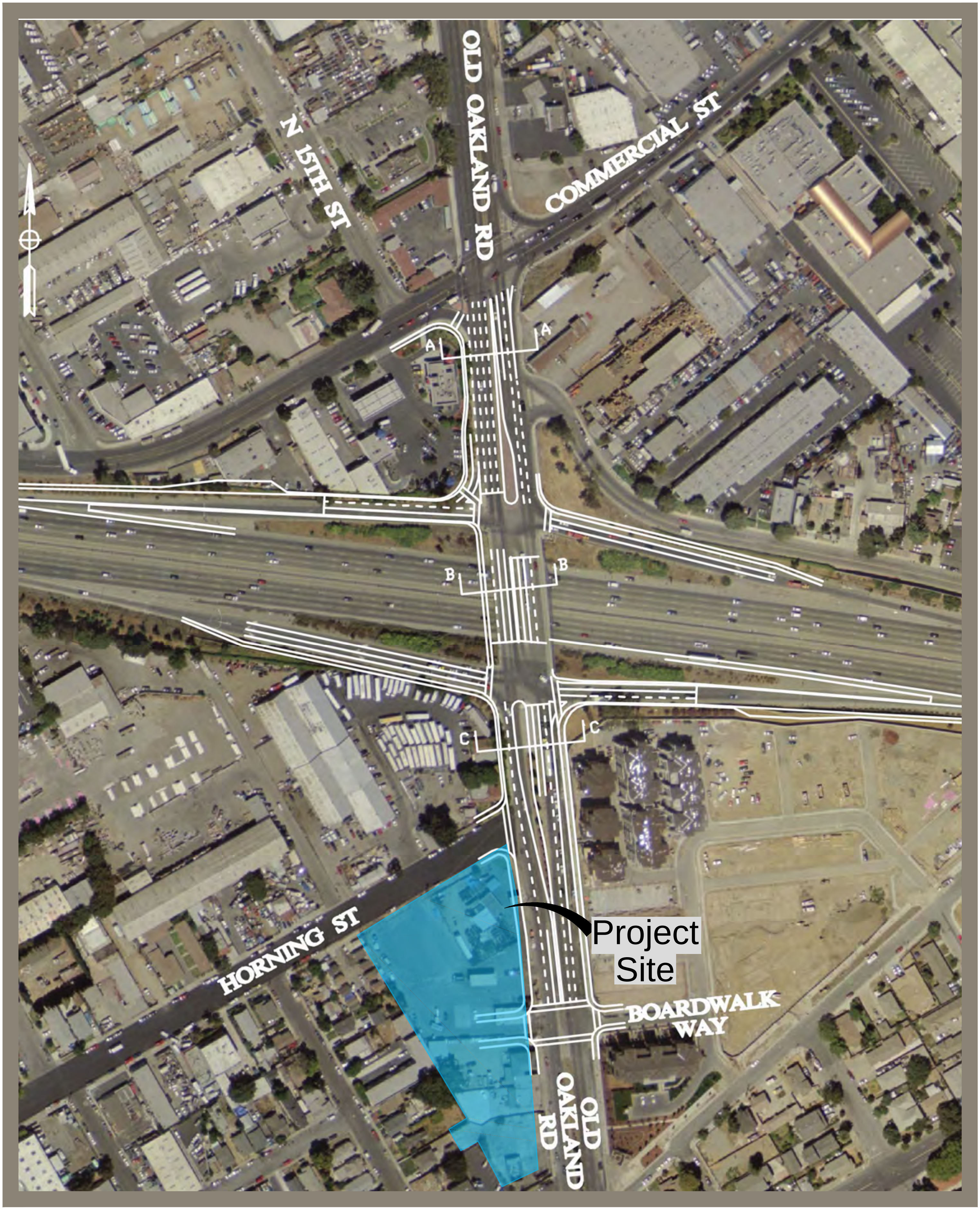


Figure 4-5

US-101/Oakland Road/Mabury Road Planned Improvements

4.4.4 Background Conditions

The City maintains a database of vehicle-trips of approved but not yet constructed projects, known as the Approved Trip Inventory (ATI), for use in the LTA. City staff provided ATI volumes at the study intersections for this analysis. The ATI volumes were added to the existing count data to represent background conditions. **Appendix C** summarizes the ATI projects and trips at the study intersections. The ATI peak hour volumes were added to the existing intersection turning movement volumes to produce the AM and PM peak hour background volumes against which the project impacts are evaluated.

Figure 4-6 illustrates AM peak hour background intersection volumes, and **Figure 4-7** illustrates PM peak hour background intersection volumes. **Table 4-2** summarizes the delay and corresponding LOS under background conditions.

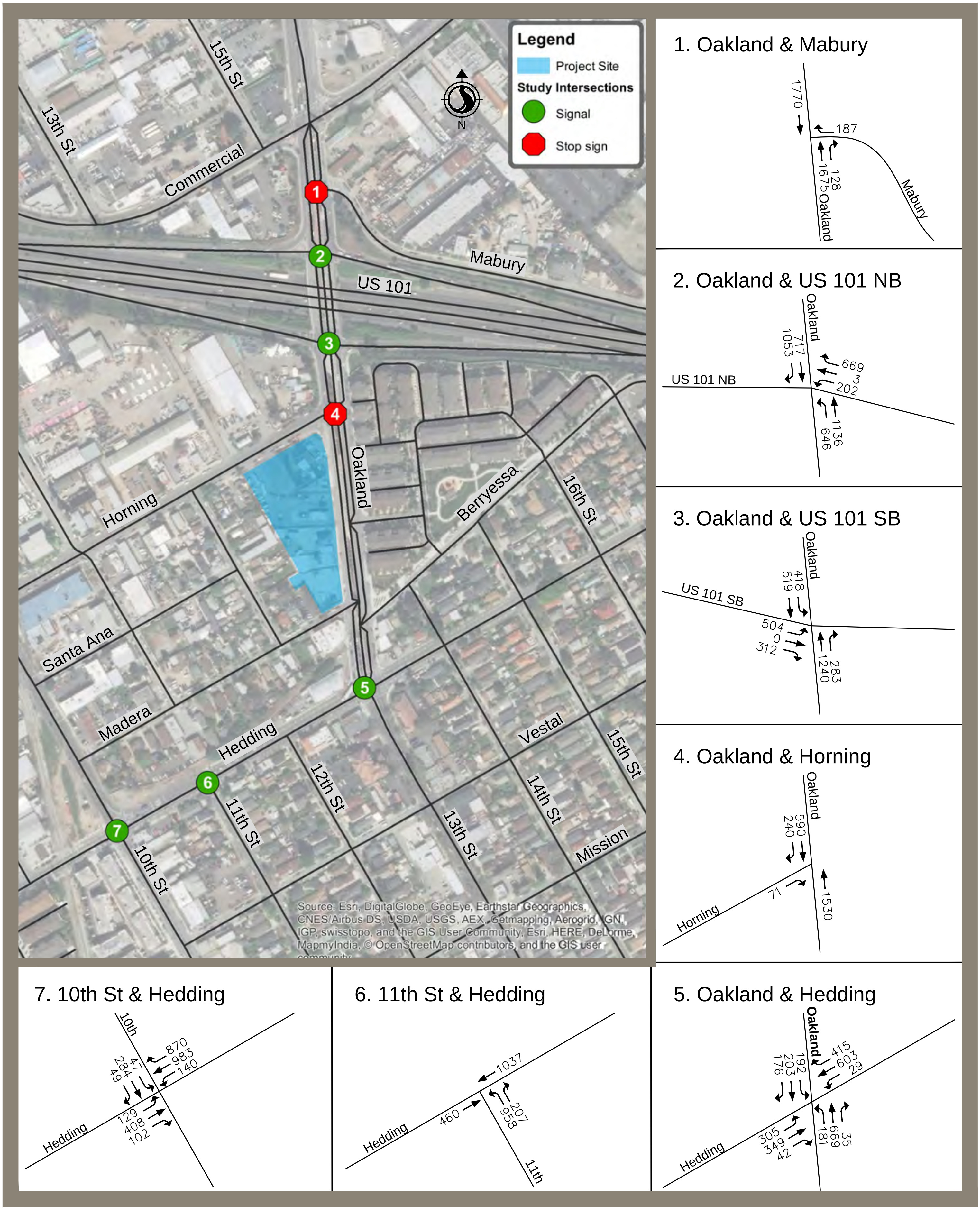
Table 4-2 Background Delay and Level of Service Summary

		AM Peak Hour		PM Peak Hour	
Intersection	**Control**	**Delay**	**LOS**	**Delay**	**LOS**
1. Oakland & Mabury	Stop Sign	32.0 sec	D	15.5 sec	C
2. Oakland & US 101 NB [1]	Signal	**56.2 sec**	**E**	**56.7 sec**	**E**
3. Oakland & US 101 SB [1]	Signal	29.2 sec	C	**69.5 sec**	**E**
4. Oakland & Horning	Stop Sign	11.9 sec	B	**222.6 sec**	**F**
5. Oakland & Hedding	Signal	51.8 sec	D	52.7 sec	D
6. 11th St & Hedding	Signal	36.3 sec	D	17.8 sec	B
7. 10th St & Hedding	Signal	23.4 sec	C	46.6 sec	D

Notes:
[1] US 101/Oakland/Mabury TDP intersection and CMP intersection

sec = Seconds of delay per vehicle
LOS = Level of service
▨ Highlight indicates LOS E or F

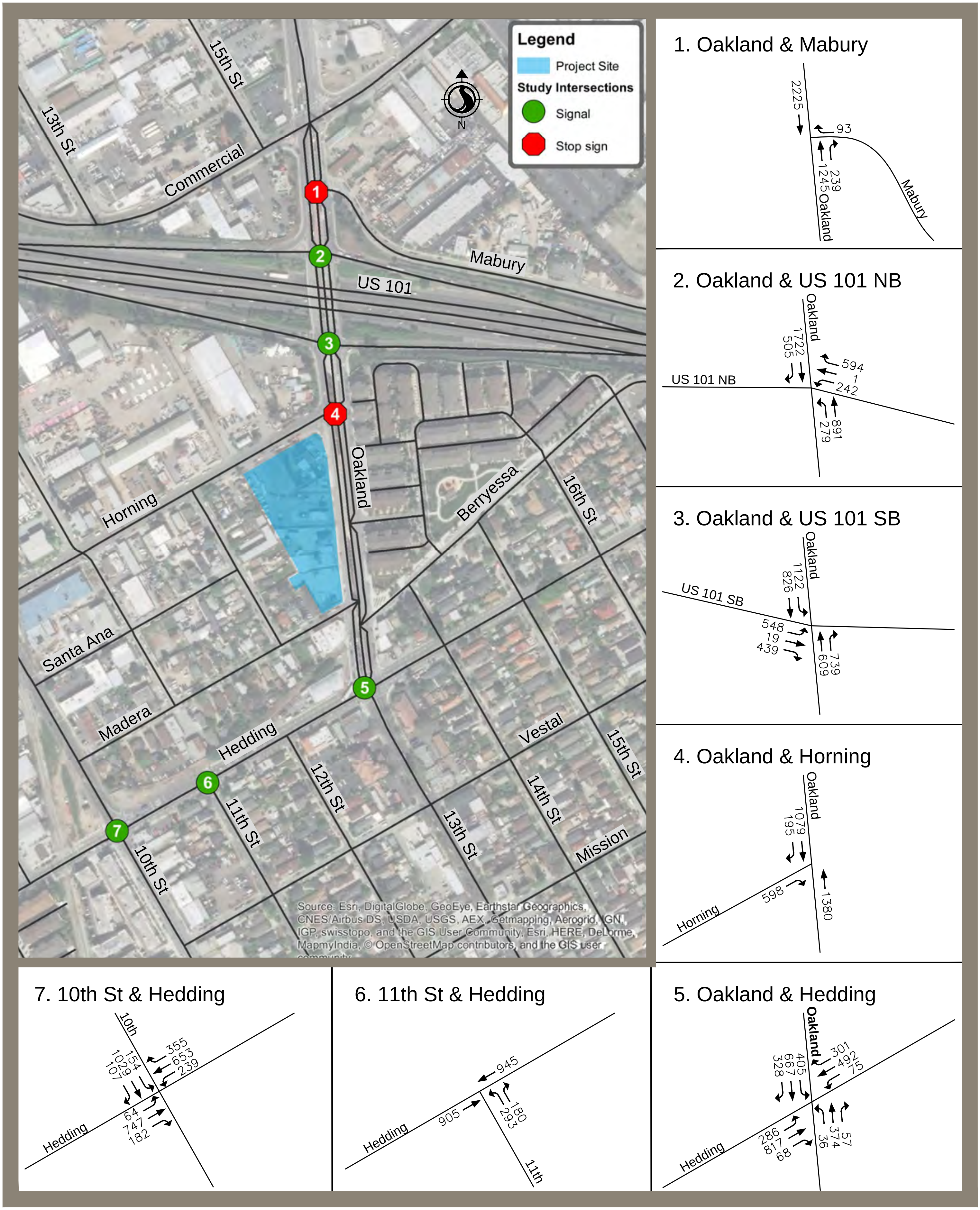
As this table shows, during the AM peak hour, the study intersection at Oakland Road and US 101 northbound ramps will operate at LOS E under background conditions. During the PM peak hour, the study intersections of Oakland Road and US 101 northbound ramps and Oakland Road and US 101 southbound ramps will operate at LOS E with the addition of ATI volumes. The stop-controlled intersection of Oakland Road and Horning Street will operate at LOS F during the PM peak hour under background conditions. The remaining study intersections will operate at acceptable LOS D or better during the AM or PM peak hour.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 4-6

Background AM Peak Hour Intersection Volumes



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Stantec

Figure 4-7

Background PM Peak Hour Intersection Volumes

4.4.5 Background plus Project Conditions

The net peak hour project trips presented in Section 4.4.3 were added to the background intersection volumes presented in the previous Section to produce background plus project conditions.

Figure 4-8 illustrates AM peak hour background plus project intersection volumes, and **Figure 4-9** illustrates PM peak hour background plus project intersection volumes.

Table 4-3 summarizes the delay and LOS under background plus project conditions and compares it with background conditions. As this table shows, the intersection of Oakland Road and US 101 northbound ramps will operate at LOS E during the AM and PM peak hour with the addition of project vehicle-trips; however, the increase in delay is less than 1.0 second and the increase in V/C is less than 0.010. The intersection of Oakland Road and US 101 southbound ramps will operate at LOS E during the PM peak hour with the addition of project vehicle-trips, but the increase in delay is less than 1.0 second and the increase in V/C is less than 0.010.

The stop-controlled intersection of Oakland Road and Horning Street will operate at LOS F during the PM peak hour under background conditions. The project increases the delay for the eastbound right-turn traffic by 4.7 seconds, a 2 percent increase. However, the Traffix software may be overestimating the delay for the eastbound right-turn movement since the signal at the adjacent intersection at US 101 southbound would create gaps in the southbound through traffic allowing the eastbound right-turn movement to turn. Furthermore, signalization of the intersection is not recommended since stopping the southbound through movement could create queues that might back up to the US 101 southbound ramps.

The remaining study intersections will operate at LOS D or better during the AM and PM peak hour.

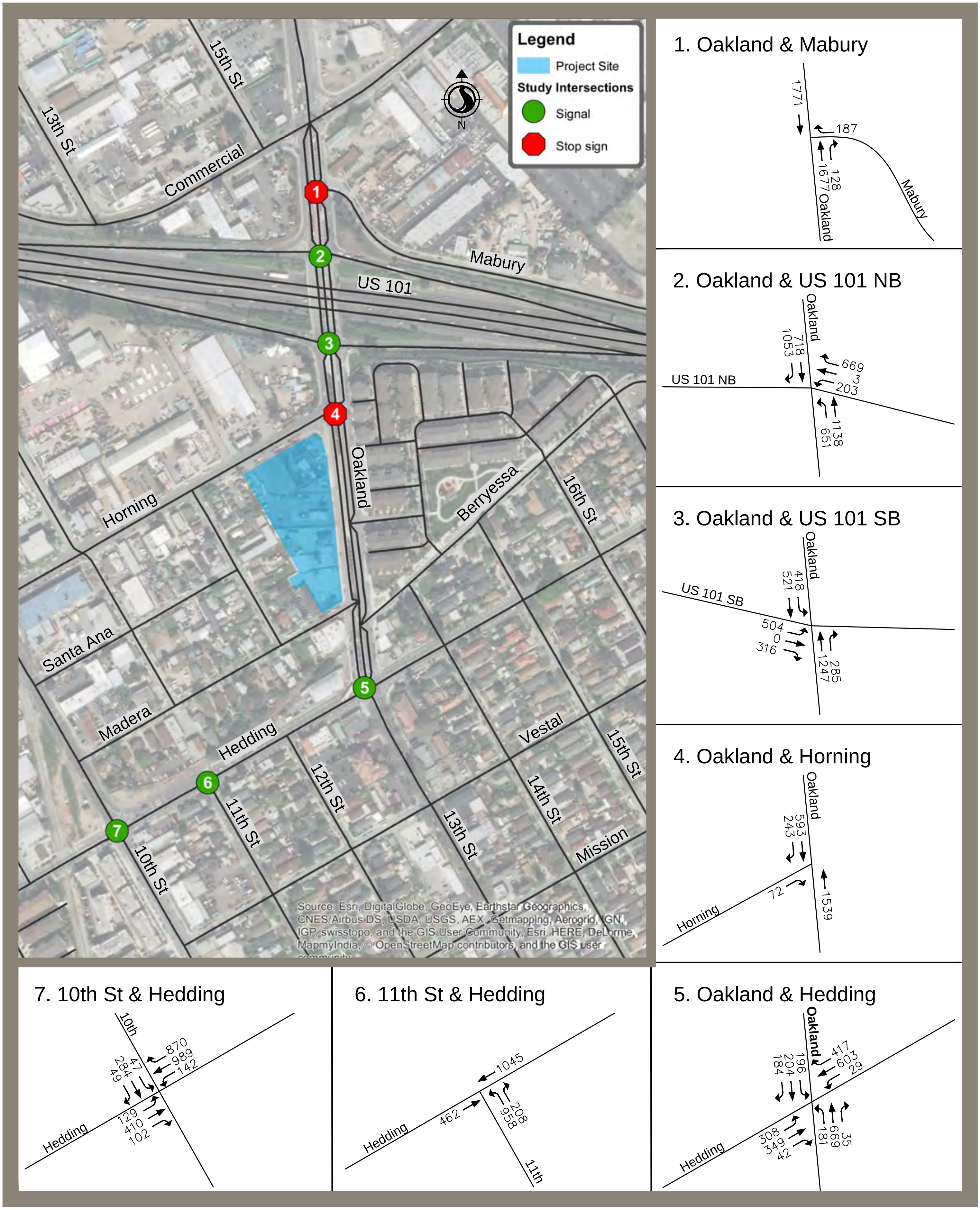
As discussed in Chapter 1.0, an adverse effect on intersection operations occurs when the analysis demonstrates that the project causes the operations standard at a study intersection to fall below LOS D with the addition of project vehicle-trips to baseline conditions. For signalized intersections already operating at LOS E or F under background conditions, the criteria for determining adverse intersection operations from the project impact is:

- An increase in average critical delay by 4.0 seconds or more AND an increase in the critical V/C ratio of 0.010 or more; OR
- A decrease in the average critical delay AND an increase in critical V/C ratio of 0.010 or more.

Based on these criteria, none of the study intersections are adversely affected by the proposed project.

4.4.6 Project Entrance Analysis

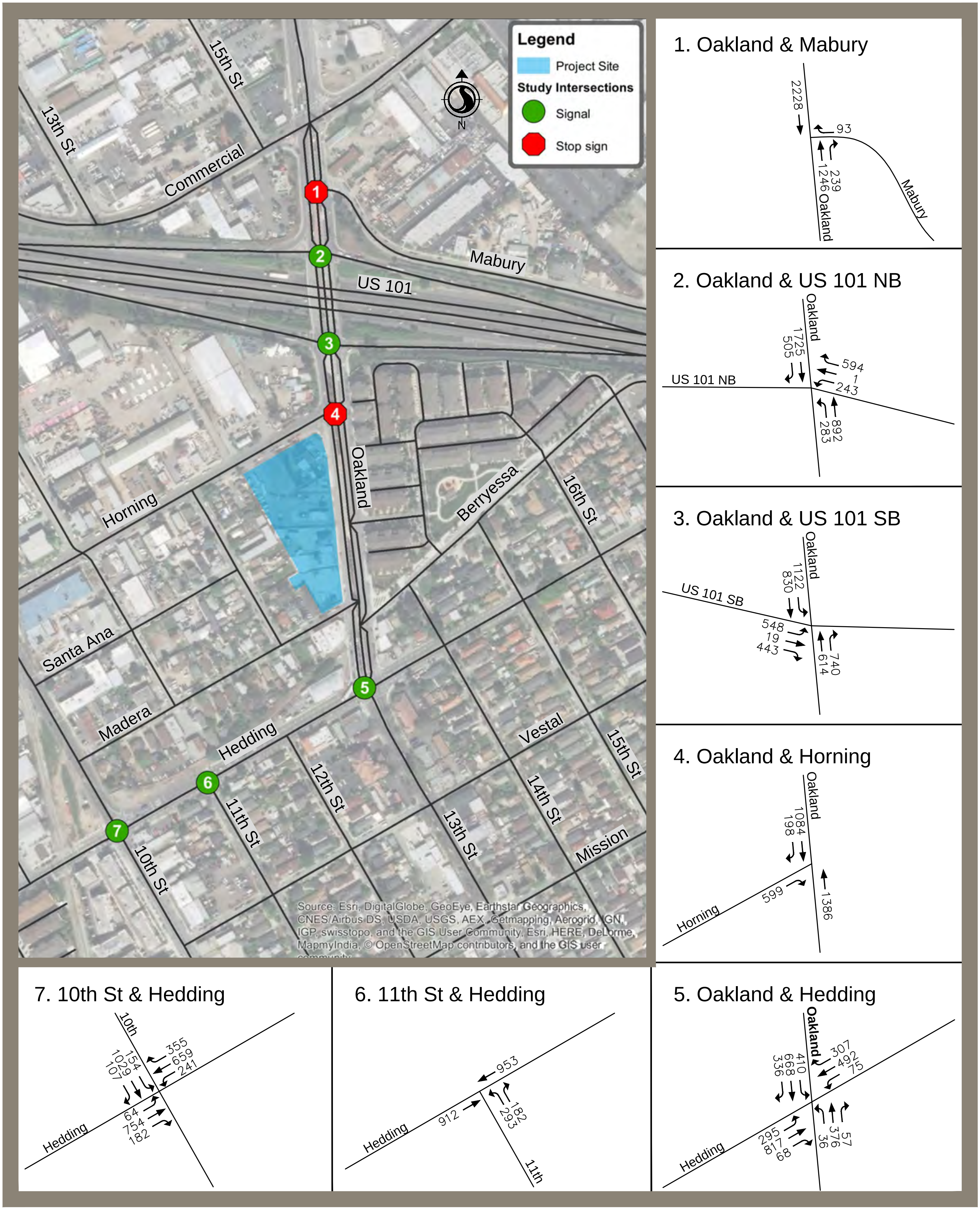
The project entrance on Oakland Road was analyzed. The raised median on Oakland Road currently restricts outbound vehicles from Boardwalk Way opposite the location of the proposed driveway to right turns only. An existing median break allows inbound left turns from southbound Oakland Road to Boardwalk Way. This southbound left-turn pocket also allows vehicles turning right from Horning Street to make a U-turn to travel northbound on Oakland Road. This southbound left-turn pocket is approximately 175 feet long. The proposed project would modify the raised median to allow full access at the project entrance, which would also allow westbound left turns from Boardwalk Way to southbound Oakland Road. A signal is proposed at the project entrance and protected northbound and southbound



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 4-8

Background Plus Project AM Peak Hour Intersection Volumes



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 4-9

Background Plus Project PM Peak Hour Intersection Volumes

Table 4-3 Background Plus Project Delay and Level of Service Summary

		Background				**Background + Project**								
		AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**				**PM Peak Hour**				
Intersection	**Control**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Incr. in Delay**	**Incr. in V/C**	**Delay**	**LOS**	**Incr. in Delay**	**Incr. in V/C**	**Adverse Effect?**
1. Oakland & Mabury	Stop Sign	32.0 sec	D	15.5 sec	C	32.1 sec	D	0.1 sec	N/A	15.5 sec	C	0.0 sec	N/A	No
2. Oakland & US 101 NB [1]	Signal	**56.2 sec**	**E**	**56.7 sec**	**E**	**56.7 sec**	**E**	0.5 sec	0.004	**57.5 sec**	**E**	0.8 sec	0.003	No
3. Oakland & US 101 SB [1]	Signal	29.2 sec	C	**69.5 sec**	**E**	29.3 sec	C	0.1 sec	0.004	**70.1 sec**	**E**	0.6 sec	0.003	No
4. Oakland & Horning	Stop Sign	11.9 sec	B	**222.6 sec**	**F**	12.0 sec	B	0.1 sec	N/A	**227.3 sec**	**F**	4.7 sec	N/A	No
5. Oakland & Hedding	Signal	51.8 sec	D	52.7 sec	D	52.1 sec	D	0.3 sec	0.005	53.1 sec	D	0.4 sec	0.003	No
6. 11th St & Hedding	Signal	36.3 sec	D	17.8 sec	B	36.6 sec	D	0.3 sec	0.004	17.8 sec	B	0.0 sec	0.006	No
7. 10th St & Hedding	Signal	23.4 sec	C	46.6 sec	D	23.5 sec	C	0.1 sec	0.004	47.1 sec	D	0.5 sec	0.005	No

Notes:

[1] US 101/Oakland/Mabury TDP intersection and CMP intersection

sec = Seconds of delay per vehicle
LOS = Level of service
V/C = Volume/Capacity ratio
N/A = Not applicable
▨ Highlight indicates LOS E or F

left-turn phasing was assumed. Split phasing was assumed for the eastbound and westbound movements since the westbound leg is not wide enough for a separate left-turn lane, and the through volumes are expected to be nominal. To analyze the proposed project entrance, an estimate was made of the number of peak hour westbound left-turn vehicles which might exit Boardwalk Way if full access is allowed based on trip generation and distribution information contained in the approved Transportation Impact Analysis prepared in 2005 for the Modern Ice Townhomes development.

The project entrance on Oakland Road would operate at LOS B during the AM and PM peak hours with a signal. The project entrance on Horning Street will not be signalized. This driveway will operate at LOS B during the AM peak hour and LOS C during the PM peak hour (delay and LOS calculations for the project driveways are included in **Appendix D**).

4.5 QUEUING ANALYSIS

The Traffix calculations provide vehicle queue information to determine the amount of left-turn storage required to accommodate the traffic demand. The proposed project driveway on Oakland Road is approximately 525 feet north of Hedding Street. The median on Oakland Road will be modified to provide a northbound left-turn pocket into the proposed project driveway. The northbound left-turn pocket into the proposed project driveway cannot be so long that it interferes with the existing southbound left-turn pocket at Hedding Street, which is approximately 120 feet long.

The Traffix calculations provide queue information to determine left-turn storage needs for the left-turn pockets along Oakland Road. Queues are expressed in number of vehicles.

Table 4-4 summarizes the southbound queue at Hedding Street and the queues at the proposed project driveway.

The maximum average eastbound queue exiting the project site during the peak hours is one vehicle which requires approximately 25 feet of storage. The maximum northbound left-turn queue into the site is two vehicles (approximately 50 feet); therefore, the City’s minimum left-turn storage length of 90 feet with a 90-foot taper for a 35-mph street will be sufficient to accommodate the northbound left-turn queue. The maximum average southbound left-turn/U-turn queue on Oakland Road is eight vehicles (approximately 200 feet). This turn pocket is currently approximately 175 feet long and may need to be lengthened to accommodate the anticipated queue. The maximum average queue westbound on Boardwalk Way is three vehicles which would require approximately 75 feet. These queue lengths are based on estimates of the Modern Ice Townhomes development peak hour volumes expected to use a signalized full-access intersection in the future.

The average southbound left-turn queue at Hedding Street increases from 12 vehicles (300 feet) under existing conditions to 22 vehicles (550 feet) with the addition of ATI volumes under background conditions. The addition of project traffic has no impact on the southbound left-turn queue length. However, the southbound left-turn queue will back up to approximately the project driveway.

Table 4-5 summarizes the approximate turn pocket lengths at the project entrance on Oakland Road based on the anticipated peak hour queues. These pocket lengths should be confirmed during the signal design permit process.

Table 4-4 Queue Analysis Summary

Left-Turn Pocket	Existing				Background				Background + Project (with signal)			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Vehs	Length (ft)	Vehs	Length (ft)	Vehs	Length (ft)	Vehs	Length (ft)	Vehs	Length (ft)	Vehs	Length (ft)
Hedding Street												
Southbound	5	125	12	300	11	275	22	550	11	275	22	550
Project Driveway												
Northbound	N/A	--	N/A	--	N/A	--	N/A	--	1	25	2	50
Southbound	< 1	25	2	50	< 1	25	3	75	3	75	8	200
Eastbound	N/A	--	N/A	--	N/A	--	N/A	--	1	25	< 1	25
Westbound	< 1	25	< 1	25	< 1	25	< 1	25	3	75	1	25
N/A – Not applicable												

Table 4-5 Oakland Road Left-Turn Pocket Length Summary

Left-Turn Pocket	Existing	Background	Background + Project (with signal)
Project Driveway			
Northbound	--	--	90 ft
Southbound	175 ft	175 ft	200 ft
Eastbound	--	--	25 ft
Westbound *	150 ft	150 ft	150 ft
* Shared left-turn and right-turn lane			

4.6 SIGNAL WARRANT

The project proposes to modify the raised median to allow full access at the proposed project entrance opposite Boardwalk Way. This entrance is proposed to be signalized. The minimum peak hour side street volume required to satisfy the peak hour signal warrant is 100 vehicles. Since westbound left turns are currently prevented by the raised median on Oakland Road, future westbound left turns were estimated from the trip generation and distribution estimates in the Modern Ice Transportation Impact Analysis. The estimated westbound AM peak hour volume is 91 vehicles. A signal is not warranted at this location, although the basis for satisfaction of the warrant is the estimated peak hour traffic from Boardwalk Way, and the estimate is very close to satisfying the peak hour warrant. Installation of a signal and opening of the median to allow westbound left turns could result in a higher volume on Boardwalk Way than estimated here which would satisfy the signal warrant. With a signal, the intersection will operate at LOS B during the AM and PM peak hours. Without the signal, the intersection would operate at LOS F.

Besides providing the proposed development with left-turn access to Oakland Road, the signal will provide protected westbound left-turn access to Oakland Road for motorists in the Modern Ice Townhomes development, a movement that is not currently allowed. The existing median on Oakland Road currently prevents westbound left turns from Boardwalk Way to southbound Oakland Road, and motorists from the townhomes development wishing to travel on Hedding Street or to other destinations toward the south must cut through on the residential streets of 14th Street, 15th Street, 16th Street, 17th Street, or Bayshore Road to Hedding Street. Furthermore, the intersections of these residential streets with Hedding Street are not signalized, which makes turning left onto Hedding Street difficult during peak periods. The proposed signal at Boardwalk Way will provide outbound Modern Ice Townhomes motorists with access to the signal at Oakland Road and Hedding Street. In addition, the signal will provide protected left-turn phasing for southbound traffic at Boardwalk Way which is currently an unprotected movement.

The signal will provide controlled bicycle and pedestrian crossing of Oakland Road at Boardwalk Way. The existing median prevents bicycle crossings of Oakland Road between US 101 and Hedding Street, with the exception of southbound bicycles turning left at Boardwalk Way. However, inexperienced or timid bicyclists avoid turning left at Boardwalk Way since they have to cross two lanes of southbound traffic to enter the left-turn pocket and make the left turn during gaps in two lanes of oncoming northbound traffic. The lack of median breaks to allow bicyclists to cross Oakland Road leads to dangerous wrong-way riding on Oakland Road. The proposed signal and median break provide a controlled crossing of Oakland Road approximately halfway between US 101 and Hedding Street.

The existing median on Oakland Road also discourages pedestrian crossings. At this time the only protected crosswalks across Oakland Road in the study area are located at the signals at Hedding Street and at Commercial Street north of US 101. Pedestrian crossing of Oakland Road at the signals at the US 101 interchange is prohibited. Pedestrians aren’t prohibited from crossing Oakland Road at any of the intersections between US 101 and Hedding Street; however, they must dash across the street during gaps in traffic and scramble across the raised median. Pedestrians with mobility challenges are prevented from crossing at these intersections. The proposed signal and median break at Boardwalk Way will provide an accessible and controlled crossing of Oakland Road to promote pedestrian connectivity between the residential uses on the east side of Oakland Road and the commercial uses on the west side.

4.7 SITE CIRCULATION AND ACCESS

Two driveways will provide access to the project site. The main driveway is located on Oakland Road opposite Boardwalk Way providing access to the two parcels. This driveway will provide full access to Oakland Road. A second driveway is located on Horning Avenue at the western edge of the site.

Pedestrian access is shown on the site plan in Figure 1-2. Crosswalks at the new signalized intersection with Oakland Road opposite Boardwalk Way will be provided across the west, east, and south legs of the intersection. The proposed signal will provide a new controlled crossing of Oakland Road for pedestrians. The sidewalk along the project frontage on Horning Street will be improved. Connections between the hotel and the sidewalk on Horning Street and Oakland Road will be provided. Pedestrian access from Oakland Road to the proposed car wash will be provided by a sidewalk on the south side of the main access aisle.

Council Policy 6-10

The City Council approved Council Policy 6-10 - Criteria for the Review of Drive-Through Uses in 1979 and updated the policy in 1990. The purpose of the policy is to provide guidelines for the development of drive-through facilities within the City. According to Council Policy 6-10, development shall be restricted to Commercial Zoning Districts, designated as C-1, C-2, and C-3, and to Planned Development (PD) zoning; however, the current CIC zoning is a Commercial Zoning District which did not exist at the time the policy was written and is consistent with the policy.

Stacking at the car wash will be provided for five vehicles between the pay station and the first parking space as shown in **Figure 4-10**. Stacking for a total of 13 vehicles is provided between the pay station and the main access aisle. The car wash requires stacking for 5 vehicles based on the City Municipal Code and Council Policy 6-10.

The proposed car wash meets the following Traffic Criteria:

A. Primary ingress and egress of the proposed car wash is from the Oakland Road, a four-lane major street

B. The drive-through stacking is situated so that overflow from the stacking lane queues on-site along the western edge of the car wash parcel. The total stacking capacity is 13 vehicles; therefore, the overflow capacity (8 vehicles) is more than 50 percent of the required stacking (5 vehicles)

C. The ingress and egress point does not conflict with turning movements of street intersections

D. The ingress and egress point is more than 300 feet from the nearest signalized intersection

E. The drive-through stacking lane is separated physically from the parking lot and provides stacking for 5 vehicles between the pay station and the first parking space

F. There is no pedestrian crossing of the drive-through lane

G. The proposed car wash drive-through stacking lane is located at the western edge of the car wash parcel, approximately 175 feet from the new signalized intersection.

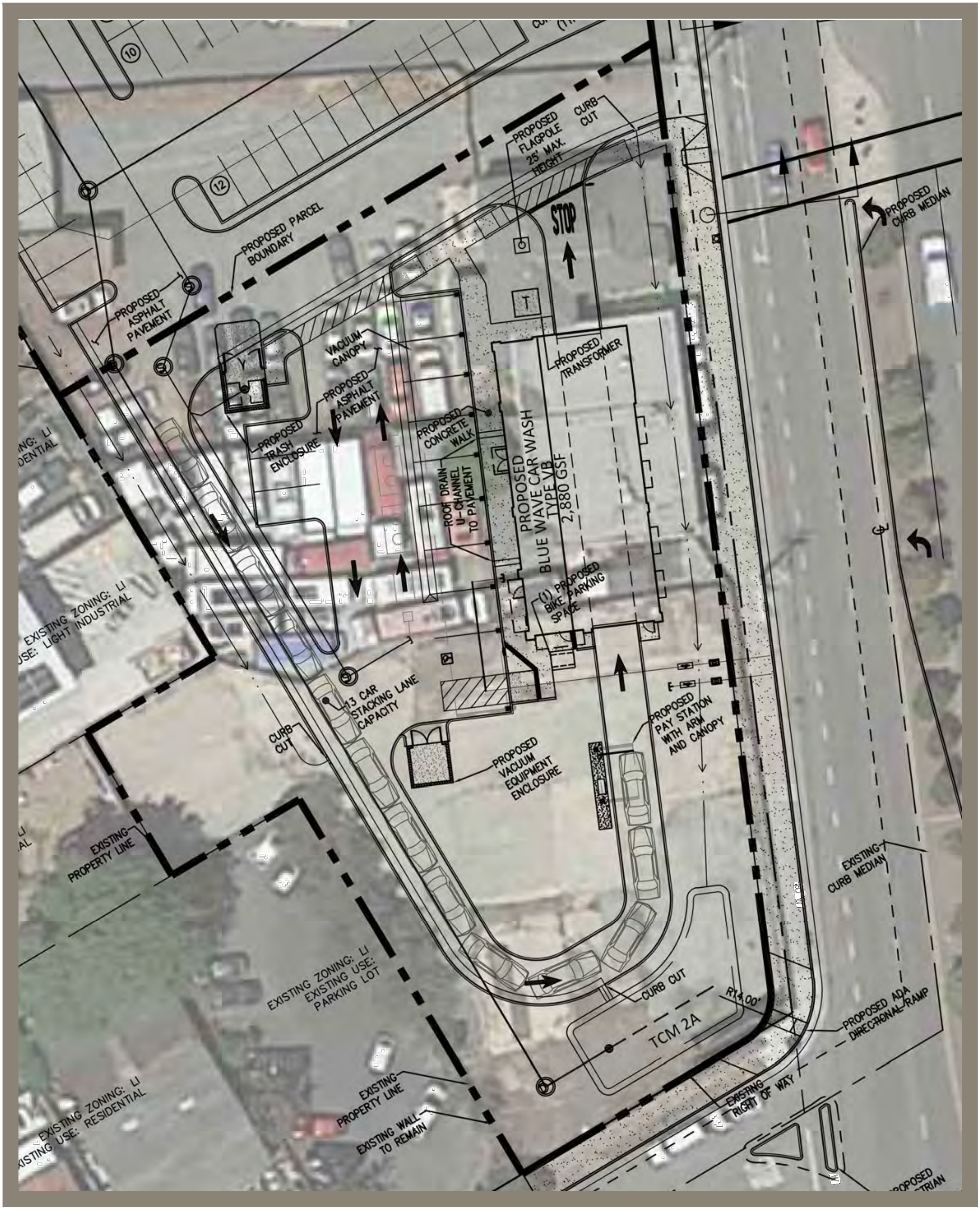


Figure 4-10

Proposed Car Wash Stacking

4.8 DELIVERY, WASTE, AND MOVING TRUCKS

The site plan has been designed to accommodate trucks.

An on-site loading zone for deliveries is provided for the business hotel in the northeast area of the hotel parking lot. The space is approximately 30 feet long. Delivery trucks can access the site from either Horning Street or Oakland Road and circulate through the hotel parking lot to and from the loading zone. The car wash does not require a designated loading zone.

Separate trash enclosures are provided for the business hotel and the car wash. The trash enclosure for the business hotel is located on the eastern edge of the property adjacent to the building and across from the loading zone. A garbage truck can enter and exit the site and access the hotel trash enclosure from either Horning Street or Oakland Road and circulate through the hotel parking lot. The car wash trash enclosure is located along the main drive aisle in the northwest area of the car wash parcel. A garbage truck can access the car wash trash enclosure from the main drive aisle and will not need to enter the car wash area.

Once the business hotel is furnished and open to guests, large moving trucks are not expected at the hotel. Business hotel guests will not arrive with large moving trucks. Similarly, car wash customers will not arrive with large moving trucks.

4.9 PARKING

Parking on the hotel parcel will be provided for 100 vehicles consisting of 56 regular parking spaces, 4 ADA spaces, and 40 compact spaces. The hotel requires one space per room plus one space per employee based on the City Municipal Code. The 116-room business hotel is anticipated to employ 8 people; therefore, the business hotel requires 124 spaces based on the City Code. The business hotel does not meet the minimum City Code parking requirement.

A Transportation Demand Management (TDM) plan will be required for the project. The TDM will result in a 20 percent reduction in the business hotel parking demand. With the 20 percent TDM reduction, the business hotel will require 100 parking spaces, and the business hotel satisfies the parking requirement.

Parking on the car wash parcel will be provided for 12 vehicles consisting of 3 employee spaces, 8 regular vacuum spaces, and 1 ADA accessible vacuum space. Stacking for 13 vehicles between the pay station and the main drive aisle will be provided. The car wash requires one space per employee plus stacking for 5 vehicles (20 feet per car) based on City Code. The proposed car wash is anticipated to employ 3 people; therefore, the car wash requires 3 parking spaces and stacking for 5 vehicles per City Code. The car wash meets the City Code parking requirement.

Bicycle parking will be provided for 13 bikes on the hotel parcel. City Code requires 1 bicycle space plus 1 space per 10 rooms. Based on the City Code, the business hotel requires 13 bicycle parking spaces. Bicycle parking will be provided for 1 bike on the car wash parcel. City Code requires 1 bicycle space per 10 employees for car wash facilities. The proposed car wash requires 1 bicycle space based on the City Code.

4.10 NEIGHBORHOOD TRAFFIC INTRUSION

The project will generate little peak hour traffic above what is already generated from the site. The hotel traffic is expected to be attracted to the airport, Civic Center, and Downtown San Jose areas and will keep to the main streets and freeway. The car wash traffic will be attracted from the surrounding residential and commercial areas, but cut-through traffic through the neighborhoods is not expected to be an issue.

5.0 CONCLUSIONS

The proposed project consists of a 116-room business hotel and automated car wash. The project is located on Oakland Road between Horning Street and Madera Avenue. The project site will have two driveways, one on Oakland Road and one on Horning Street.

Project trips were calculated based on ITE trip rates and an existing car wash case study driveway count. Location based reduction for Suburban with Multifamily Housing area was applied to the hotel component of the project. Furthermore, trips generated by the existing development on the site were subtracted from the project trip generation to obtain net new project vehicle trips. The proposed project will generate 45 new vehicle trips during the AM peak hour, 62 new vehicle trips during the PM peak hour, and 723 new vehicle trips daily.

The City's VMT Evaluation Tool has four categories of land uses (Residential, Office, Retail, and Industrial), and hotel does not fall into any of the designated land use categories. The proposed land uses cannot be evaluated with the VMT Evaluation Tool or with the Travel Demand Model. Therefore, both the business hotel and the car wash require a qualitative evaluation and comparison to retail land uses as defined in Council Policy 5-1. The proposed hotel and car wash project trip generation estimates were converted to an equivalent amount of retail square footage based on the daily trips. The resulting retail square footage was compared with the CEQA VMT Analysis Screening Criteria in the Transportation Handbook 2018 to determine conformance to Council Policy 5-1 for the proposed 116-room hotel and automated car wash. Based on the daily trip generation for the proposed project, the project is equivalent to 38,000 square feet of retail uses, which exempts the project from a CEQA VMT analysis. The project site is located within two miles of the Mineta San Jose Airport, Civic Center, and Downtown San Jose. These local facilities will attract a large portion of the proposed hotel trips, resulting in a lower VMT for the project than existing VMT for the area of 15.43 per non-industrial worker. Additionally, motorists will choose a car wash that is convenient rather than drive miles out of their way to a car wash. If the proposed car wash is more convenient than an existing car wash, then motorists will divert existing car wash trips to the proposed car wash. Furthermore, the majority of car wash trips would be pass-by or diverted trips where the motorist stops at the car wash on their way to another destination.

The net new project trips were distributed to the surrounding street network based on levels and locations of development in relation to the project site. Separate distribution patterns for the business hotel and car wash were developed. The business hotel trips were primarily distributed to the Mineta San Jose Airport, Civic Center, and Downtown San Jose, while the car wash trips were distributed to surrounding residential and commercial areas.

The study area was defined with concurrence of the City, and five signalized intersections and two stop-controlled intersections in proximity of the project site were identified as the study intersections. Peak hour turning movement counts were collected in July and September 2018 at the study intersections.

Background conditions were developed by adding trips from approved but not yet constructed projects in the City's ATI database to the existing intersection volumes. These background volumes provide the conditions against which the project impacts are evaluated.

The net new project vehicle-trips were added to the background volumes. The delay and LOS for background plus project conditions were compared with the background delay and LOS. Three study intersections operate at deficient LOS under background conditions; however, the project has no adverse effect on these or any of the study intersections.

The City adopted the US-101/Oakland/Mabury Transportation Development Policy (TDP) in 2007 which defines the interchange capacity available, identifies the required improvements for future development in the area, explains the funding to complete the required improvements, establishes a traffic fee program for new development in the area to fund the improvements, promotes industrial land use in the area, and allows the LOS of signalized intersections covered by the TDP to temporarily exceed the City's LOS standards until the required improvements are constructed. Major regional transportation projects that are recognized as necessary to provide adequate access to the US 101 freeway and the planned BART station include modification of the US 101/Oakland Road interchange and construction of the US 101/Mabury Road interchange. The City Council established a Traffic Impact Fee program to cover the unfunded cost of the Planned Improvements. Based on the trip distribution and assignment, the project adds 14 PM peak hour trips to the Oakland Road/US 101 interchange. This volume of project trips could be reduced if the business hotel were to provide a shuttle service for guests to and from destinations such as the airport.

The project entrance on Oakland Road opposite Boardwalk Way is proposed to be signalized. The raised median would be modified, and the existing residential development on the east side of Oakland Road (Modern Ice Townhomes) would be given full access to Oakland Road. This location would operate at LOS F without a signal. With a signal, the intersection operates at LOS B during the AM and PM peak hours. A signal and median break at this location would provide an accessible crossing of Oakland Road to promote pedestrian connectivity and a controlled crossing for bicyclists.

The project has no adverse effect on the surrounding streets and no off-site mitigation is necessary.

6.0 REFERENCES

1. City of San Jose. April 2018. *Transportation Analysis Handbook*.
2. City of San Jose. March 2018. Council Policy 5-1.
3. Fehr & Peers. February 2018. *San Jose VMT Evaluation Tool: User Guide*.
4. City of San Jose. November 1990. Council Policy 6-10.
5. Institute of Transportation Engineers (ITE). September 2017. *Trip Generation Manual, 10th Edition*.
6. San Diego Association of Governments (SANDAG). April 2002. *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*.

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

April 15, 2015

Mr. Tod Ridgeway
RIDGEWAY DEVELOPMENT COMPANY
2804 Lafayette Avenue
Newport Beach, CA 92663

Dear Mr. Ridgeway:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this trip generation analysis for the Newport Beach Car Wash site located at 150 Newport Center Drive Car in the City of Newport Beach.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

EXISTING TRAFFIC COUNTS

Traffic counts were obtained at the 150 Newport Center Drive Car Wash driveway over three (3) average weekdays: Tuesday (March 24, 2015), Wednesday (March 25, 2015), and Thursday (March 26, 2015). The 150 Newport Center Drive Car Wash driveway is shown on Figure 1. The 24-hour two-way tube counts are included in Appendix B.

TRIP GENERATION

The 150 Newport Center Drive Car Wash traffic counts were averaged for the three weekdays. The 150 Newport Center Drive Car Wash (based upon the traffic counts) currently generates approximately 819 daily vehicle trips, 54 of which occur during the morning[1] peak hour and 75 of which occur during the evening peak hour (see Table 1). It should be noted that the car wash does not open prior to 10 AM.

---

[1] Although the car wash does not open prior to 10 AM, the traffic count worksheets (see Appendix B) show traffic volumes that could be employees/maintenance vehicles.

It been a pleasure to serve your needs on the Newport Beach Car Wash project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.

Carl Ballard, LEED GA
Principal

KUNZMAN ASSOCIATES, INC.

William Kunzman

William Kunzman, P.E.
Principal

#6069

Table 1

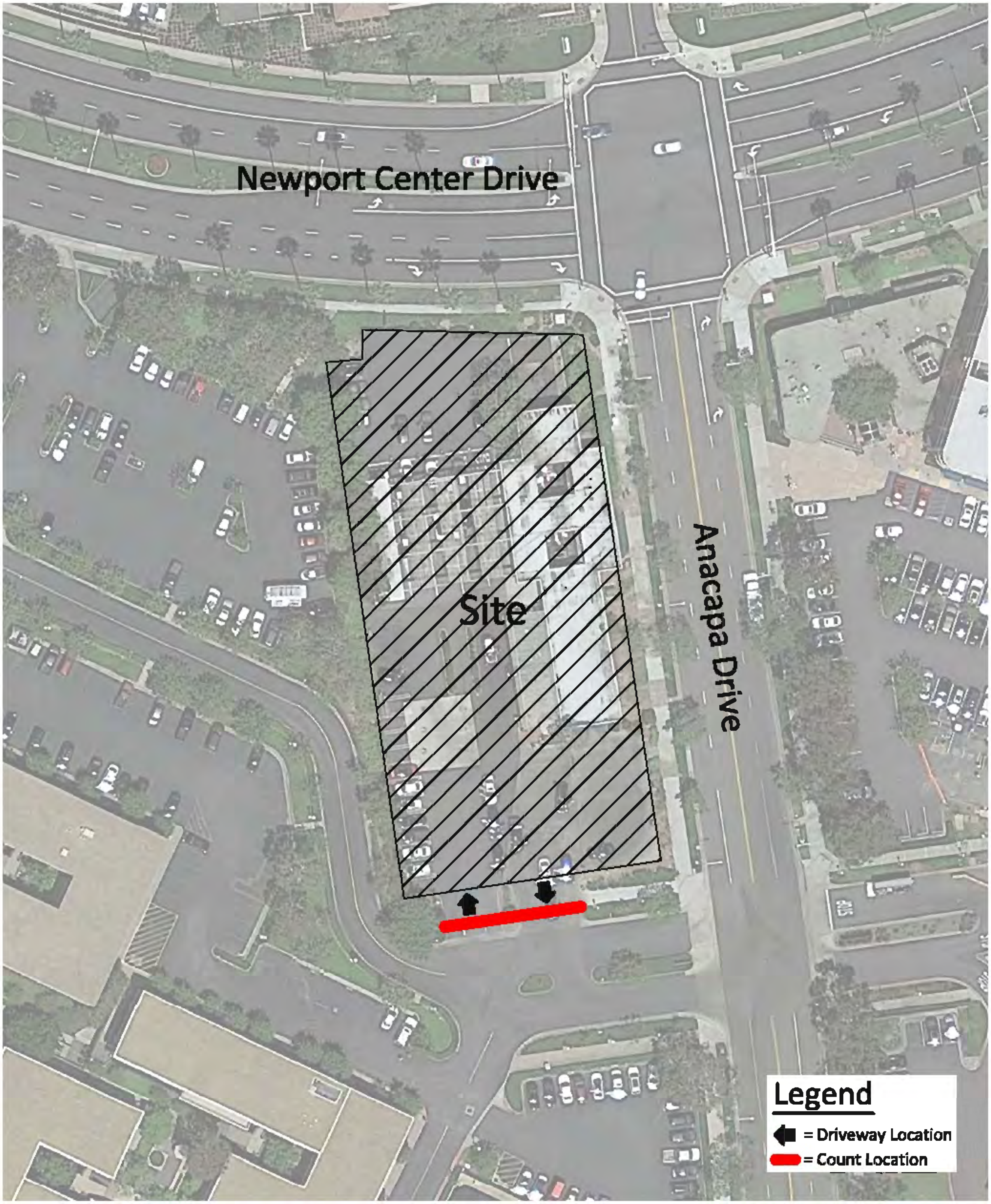
150 Newport Center Drive Car Wash Count Summary

		Peak Hour								
		Morning[1]			Evening			Daily		
Day of Week	Date	In	Out	Total	In	Out	Total	In	Out	Total
Tuesday	March 24, 2015	29	30	59	28	37	65	380	379	759
Wednesday	March 25, 2015	28	16	44	35	52	87	403	403	806
Thursday	March 26, 2015	34	25	59	37	38	75	444	448	892
Average		30	24	54	33	42	75	409	410	819

---

[1] Although the car wash does not open prior to 10 AM, the traffic count worksheets (see Appendix B) show traffic volumes that could be employees/maintenance vehicles.

Figure 1
Project Location Map



6069/1

KUNZMAN ASSOCIATES, INC.

MATT'S EXPRESS CAR WASH

TRAFFIC IMPACT ANALYSIS (REVISED)

April 22, 2014

Prepared by:

Robert Kunzman
Carl Ballard, LEED GA
William Kunzman, P.E.

William Kunzman

REGISTERED PROFESSIONAL ENGINEER
WILLIAM A. KUNZMAN
No. TR0056
TRAFFIC
STATE OF CALIFORNIA

1111 Town & Country Road, Suite 34
Orange, California 92868
(714) 973-8383

www.traffic-engineer.com

5604

Table of Contents

I. Introduction 1

- A. Project Description 1
- B. Study Area 1
- C. Analysis Methodology 2
- D. Definition of Deficiency and Significant Impact 4
  - 1. Definition of Deficiency 4
  - 2. Definition of Significant Impact 5

II. Existing Conditions 8

- A. Existing Roadway System 8
- B. Existing Volumes 8
- C. Existing Level of Service 8
- D. Existing Traffic Signal Warrant Analysis 9
- E. Planned Transportation Improvements and Relationship to General Plan 9

III. Project Traffic 17

- A. Project Description 17
- B. Trip Generation 17
- C. Trip Distribution 18
- D. Trip Assignment 19
- E. Traffic Contribution Test 19

IV. Future Conditions 27

- A. Future Volumes 27
  - 1. Existing Plus Project 27
  - 2. Opening Year (2015) Without Project 27
  - 3. Opening Year (2015) With Project 27
  - 4. Year 2035 Without Project 27
  - 5. Year 2035 With Project 28
- B. Future Level of Service 28
  - 1. Existing Plus Project 28
  - 2. Opening Year (2015) Without Project 28
  - 3. Opening Year (2015) With Project 29
  - 4. Year 2035 Without Project 29
  - 5. Year 2035 With Project 29

V. Project Mitigation 51

- A. Required Improvements and Costs 51
- B. Project Contribution and Fair Share Costs 51

VI. Conclusions and Recommendations 53

- A. Summary 53
- B. Existing Conditions 54
- C. Project Traffic 55

D. Future Conditions 55
    1. Existing Plus Project 55
    2. Opening Year (2015) Without Project 55
    3. Opening Year (2015) With Project 56
    4. Year 2035 Without Project 56
    5. Year 2035 With Project 56
E. Cost Summary 56
F. Recommendations 57
    1. On-Site Improvements 57
    2. Off-Site Improvements 58

APPENDICES

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Future Growth Increment Calculation Worksheets

Appendix D – Explanation and Calculation of Intersection Delay

Appendix E – Traffic Signal Warrant Worksheet

Appendix F – Preliminary Construction Cost Estimates for Congestion Management Program

List of Tables

Table 1. Existing Intersection Delay and Level of Service 10
Table 2. Project Trip Generation 20
Table 3. Existing Plus Project Intersection Delay and Level of Service 31
Table 4. Opening Year (2015) Without Project Intersection Delay and Level of Service 32
Table 5. Opening Year (2015) With Project Intersection Delay and Level of Service 33
Table 6. Year 2035 Without Project Intersection Delay and Level of Service 34
Table 7. Year 2035 With Project Intersection Delay and Level of Service 35
Table 8. Project Fair Share Intersection Traffic Contribution 52

List of Figures

Figure 1. Project Location Map 6
Figure 2. Site Plan 7
Figure 3. Existing Through Travel Lanes and Intersection Controls 11
Figure 4. Existing Average Daily Traffic Volumes 12
Figure 5. Existing Morning Peak Hour Intersection Turning Movement Volumes 13
Figure 6. Existing Evening Peak Hour Intersection Turning Movement Volumes 14
Figure 7. City of Redlands General Plan Circulation Element 15
Figure 8. City of Redlands General Plan Roadway Cross-Sections 16
Figure 9. Project Outbound Trip Distribution 21
Figure 10. Project Inbound Trip Distribution 22
Figure 11. Project Average Daily Traffic Volumes 23
Figure 12. Project Morning Peak Hour Intersection Turning Movement Volumes 24
Figure 13. Project Evening Peak Hour Intersection Turning Movement Volumes 25
Figure 14. Project Traffic Contribution Test Volumes 26
Figure 15. Existing Plus Project Average Daily Traffic Volumes 36
Figure 16. Opening Year (2015) Without Project Average Daily Traffic Volumes 37
Figure 17. Opening Year (2015) With Project Average Daily Traffic Volumes 38
Figure 18. Year 2035 Without Project Average Daily Traffic Volumes 39
Figure 19. Year 2035 With Project Average Daily Traffic Volumes 40
Figure 20. Existing Plus Project Morning Peak Hour Intersection Turning Movement Volumes 41
Figure 21. Existing Plus Project Evening Peak Hour Intersection Turning Movement Volumes 42
Figure 22. Opening Year (2015) Without Project Morning Peak Hour Intersection Turning Movement Volumes 43
Figure 23. Opening Year (2015) Without Project Evening Peak Hour Intersection Turning Movement Volumes 44
Figure 24. Opening Year (2015) With Project Morning Peak Hour Intersection Turning Movement Volumes 45
Figure 25. Opening Year (2015) With Project Evening Peak Hour Intersection Turning Movement Volumes 46
Figure 26. Year 2035 Without Project Morning Peak Hour Intersection Turning Movement Volumes 47
Figure 27. Year 2035 Without Project Evening Peak Hour Intersection Turning Movement Volumes 48
Figure 28. Year 2035 With Project Morning Peak Hour Intersection Turning Movement Volumes 49
Figure 29. Year 2035 With Project Evening Peak Hour Intersection Turning Movement Volumes 50
Figure 30. Circulation Recommendations 59

I. Introduction

The purpose of this revised report is to provide an assessment of the traffic impacts resulting from the proposed development of the Matt's Express Car Wash project, and to identify the traffic mitigation measures necessary to maintain the established Level of Service standard for the elements of the impacted roadway system. The traffic issues related to the proposed land uses and development have been evaluated in the context of the California Environmental Quality Act.

The City of Redlands is the lead agency responsible for preparation of the traffic impact analysis, in accordance with the California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with full occupancy of the development in Year 2015, at which time it will be generating traffic at its full potential, and for the Year 2035.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

A. Project Description

The proposed development is located at the southwest corner of the Tennessee Street and Lugonia Avenue intersection in the City of Redlands. A vicinity map showing the project location is provided on Figure 1.

The approximately 1.06 acre project site is proposed to be developed with an automated car wash facility including 8,974 square feet of building area. Figure 2 illustrates the project site plan.

B. Study Area

Regional access to the project site is provided by the I-10 and SR-210 Freeways. Local access is provided by various roadways in the vicinity of the site. The north-south roadway which will be most affected by the project is Tennessee Street. The east-west roadway which will be most affected by the project is Lugonia Avenue.

A series of scoping discussions were conducted with the City of Redlands to define the desired analysis locations for each future analysis year. In addition, staff from the City of Redlands has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does not contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project does not contribute traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the adjacent County of San Bernardino.

C. Analysis Methodology

The analysis of the traffic impacts from the proposed development and the assessment of the required mitigation measures were based on an evaluation of the existing and forecast traffic conditions in the vicinity of the site with and without the project. The following analysis years are considered in this report:

- Existing Conditions (2014)
- Existing Plus Project Conditions
- Project Opening Year Conditions (2015)
- Horizon Year Conditions (2035)

Existing intersection traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. in January 2014 (see Appendix B).

In addition, truck classification counts were conducted at the study area intersections. The existing percent of trucks were used in the conversion of trucks to Passenger Car Equivalent's (see Appendix C).

Trip generation has been estimated based on a manual vehicular count of the existing Matt's Express Car Wash facility located in the City of Rialto on January 16, 2014.

To determine the trip distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

The average daily traffic volume forecasts have been determined using the growth increment approach on the East Valley Traffic Model Year 2000 and Year 2035 average daily traffic volume forecasts (see Appendix C). This difference defines the growth in traffic over the 35 year period. The incremental growth in average daily traffic volume has been factored to reflect the forecast growth between Year 2014 and Year 2035. For this purpose, linear growth between the Year 2000 base condition and the forecast Year 2035 condition was assumed. Since the increment between Year 2014 and Year 2035 is 21 years of the 35 year time frame, a factor of 0.6 (i.e., 21/35) was used.

The Year 2035 without project daily and peak hour directional roadway segment volume forecasts have been determined using the growth increment approach on the East Valley Traffic Model Year 2000 and Year 2035 peak hour volumes. The growth increment calculation worksheets are shown in Appendix C. Current peak hour intersection approach/departure data is a necessary input to this approach. The existing traffic count data serves as both the starting point for the refinement process, and also provides important insight into current travel patterns and the relationship between peak hour and daily traffic conditions. The initial turning movement proportions are estimated based upon the relationship of each approach leg's forecast traffic volume to the other legs forecast volumes at the intersection. The initial estimate of turning movement proportions is then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program Report 255. A linear programming algorithm is used to calculate individual turning movements that match the known directional roadway segment volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The Opening Year (2015) traffic volumes have been interpolated from the Year 2035 traffic volumes based upon a portion of the future growth increment.

Project traffic volumes were then added to the model traffic volumes. Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect a minimum of 10% growth over existing traffic volumes. The result of this traffic forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

The technique used to assess the capacity needs of an intersection is known as the Intersection Delay Method (see Appendix D) based on the Highway Capacity Manual – Transportation Research Board Special Report 209. To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection. The signalized intersections are considered deficient (Level of Service F) if the overall intersection critical volume to capacity ratio equals or exceeds 1.0, even if the level of service defined by the delay value is below the defined Level of Service standard. The volume to capacity ratio is defined as the critical volumes divided by the intersection capacity. A volume to capacity ratio greater than 1.0 implies an infinite queue.

The Level of Service analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all Highway Capacity Manual runs:

> [(Curb to curb distance) / (4 feet/second)] + 7 seconds.

For existing and Opening Year traffic conditions, saturation flow rates of 1,800 vehicles per hour of green for through and right turn lanes and 1,700 vehicles per lane for single left turn lanes, 1,600 vehicles per lane for dual left turn lanes and 1,500 vehicles per lane for triple left turn lanes have been assumed for the capacity analysis.

For Year 2035 traffic conditions, saturation flow rates of 1,900 vehicles per hour of green for through and right turn lanes and 1,800 vehicles per lane for single left turn lanes, 1,700 vehicles per lane for dual left turn lanes and 1,800 vehicles per lane for double right turn lanes have been assumed for the capacity analysis.

The peak hour traffic volumes have been adjusted to peak 15 minute volumes for analysis purposes using the existing observed peak 15 minute to peak hour factors for all scenarios analyzed. Where feasible improvements in accordance with the local jurisdiction's General Plan and which result in acceptable operations cannot be identified, the Year 2035 peak hour factor has been adjusted upwards to 0.95. This is to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

The traffic mitigation needs anticipated at the time of the project opening with full occupancy and for the Year 2035 were combined into a summary of mitigation requirements and costs. The mitigation cost responsibility for the proposed development was estimated based on the percent of the increase in traffic from the existing condition to the Year 2035 that was attributed to the project-generated traffic.

D. Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the City of Redlands requirements.

1. Definition of Deficiency

The definition of an intersection deficiency has been obtained from the City of Redlands General Plan. The General Plan states that peak hour intersection operations of Level of Service C or better are generally acceptable. Therefore, any intersection operating at Level of Service D to F will be considered deficient. This project is located in the Redlands East Valley area where the peak hour intersection operations of Level of Service D or better are generally acceptable. Therefore, any intersection operating at Level of Service E or F will be considered deficient.

For freeway facilities, the Congestion Management Program controls the definition of deficiency for purposes of this study. The Congestion Management Program definition of deficiency is based on maintaining a Level of Service standard of Level of Service E or better, except where an existing Level of Service F condition is identified in the Congestion Management Program document (San Bernardino County Congestion Management Program Table 2-1). A Congestion Management Program deficiency is, therefore, defined as any freeway segment operating or projected to operate at Level of Service F, unless the segment is identified explicitly in the Congestion Management Program document.

The identification of a Congestion Management Program deficiency requires further analysis in satisfaction of Congestion Management Program requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level with respect to Congestion Management Program Level of Service standards.

- Calculation of the project share of new traffic on the impacted Congestion Management Program facility during peak hours of traffic.

- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable Level of Service as described above.

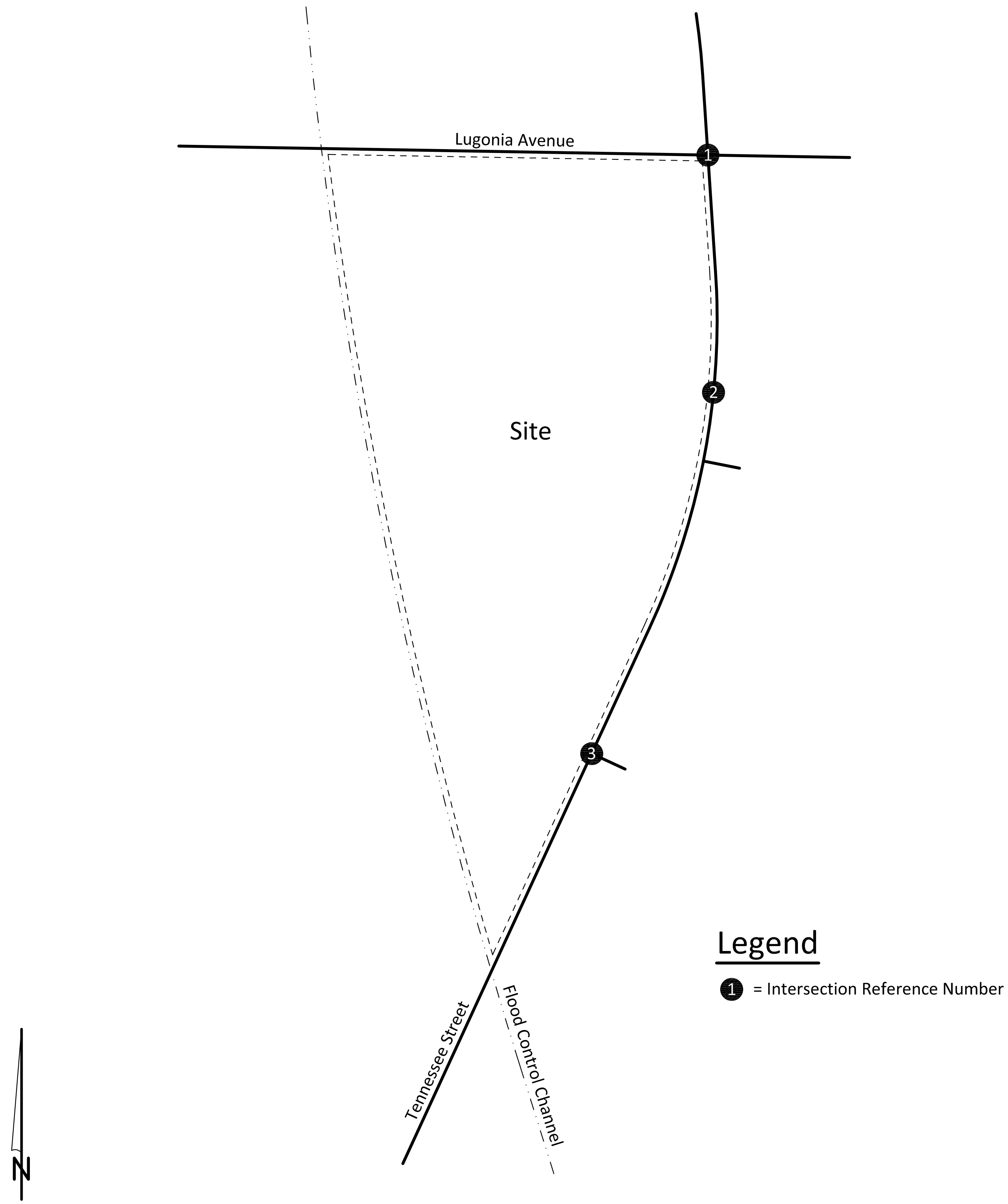
This study incorporates each of these aspects for all locations where a Congestion Management Program deficiency is identified.

2. Definition of Significant Impact

The identification of significant impacts is a requirement of the California Environmental Quality Act. The City of Redlands General Plan and Circulation Element have been adopted in accordance with California Environmental Quality Act requirements, and any roadway improvements within the City of Redlands that are consistent with these documents are not considered a significant impact, so long as the project contributes its “fair share” funding for improvements.

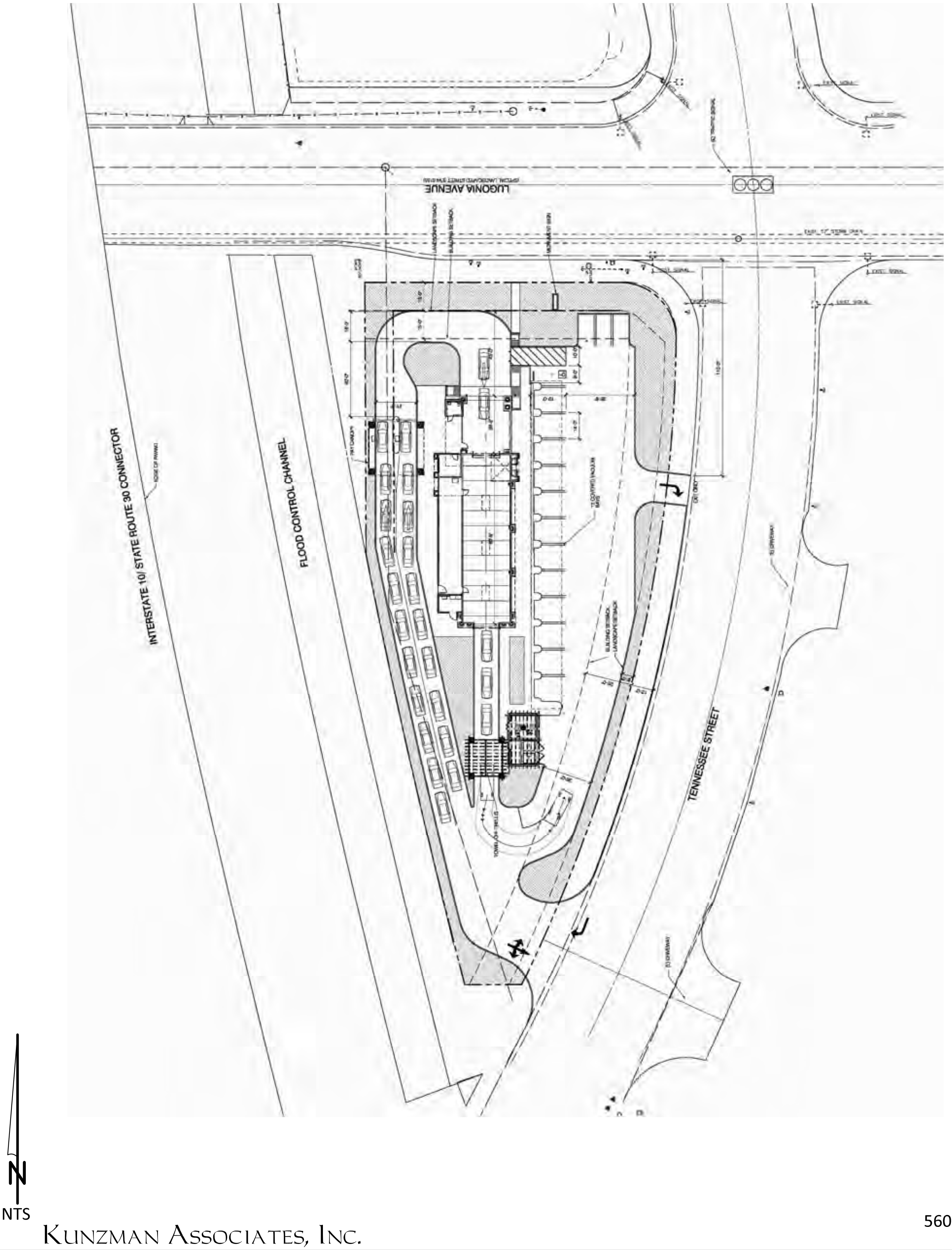
A traffic impact is considered significant if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the Level of Service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the City of Redlands General Plan cannot be constructed.

Figure 1
Project Location Map



5604/1

Figure 2
Site Plan



II. Existing Conditions

A. Existing Roadway System

Figure 3 identifies the existing conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

Regional access to the project site is provided by the I-10 and SR-210 Freeways. Local access is provided by various roadways in the vicinity of the site. The north-south roadway which will be most affected by the project is Tennessee Street. The east-west roadway which will be most affected by the project is Lugonia Avenue.

B. Existing Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes were obtained by Kunzman Associates, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach + Exit Volume) x 11.5 = Daily Leg Volume.

This is a conservative estimate and may over estimate the average daily traffic volumes.

Existing intersection traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. from January 2014 (see Appendix B) and shown on Figures 5 and 6, respectively. Explicit peak hour factors have been calculated using the data collected for this effort as well. The morning and evening peak hour traffic volumes were identified by counting the two-hour periods from 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM.

In addition, truck classification counts were conducted at the study area intersections. The existing percent of trucks were used in the conversion of trucks to Passenger Car Equivalent's (see Appendix C).

C. Existing Level of Service

The Existing delay and Level of Service for intersections in the vicinity of the project are shown in Table 1. For Existing traffic conditions, the study area intersections are currently operating within acceptable Levels of Service, except for the following study area intersection that currently operates at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    Project South Access - #3

Existing delay worksheets are provided in Appendix D.

D. Existing Traffic Signal Warrant Analysis

A traffic signal appears to currently be warranted at the following study area intersection for existing traffic conditions (see Appendix E):

Tennessee Street (NS) at:
    Project South Access (EW) - #3

The unsignalized intersection has been evaluated for a traffic signal using the California Department of Transportation Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the California Manual of Uniform Traffic Control Devices.

Per discussions with the City of Redlands staff and engineering judgment, a traffic signal is not recommended at this location because of its close proximity to the existing traffic signal located at Tennessee Street and Lugonia Avenue.

E. Planned Transportation Improvements and Relationship to General Plan

The City of Redlands General Plan Circulation Element is shown on Figure 7. Existing and future roadways are included in the Circulation Element of the General Plan and are graphically depicted on Figure 7. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Redlands General Plan roadway cross-sections are shown on Figure 8.

Table 1

Existing Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	27.1-C	36.4-D
Project South Access (EW) - #3	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	16.3-C	37.5-E

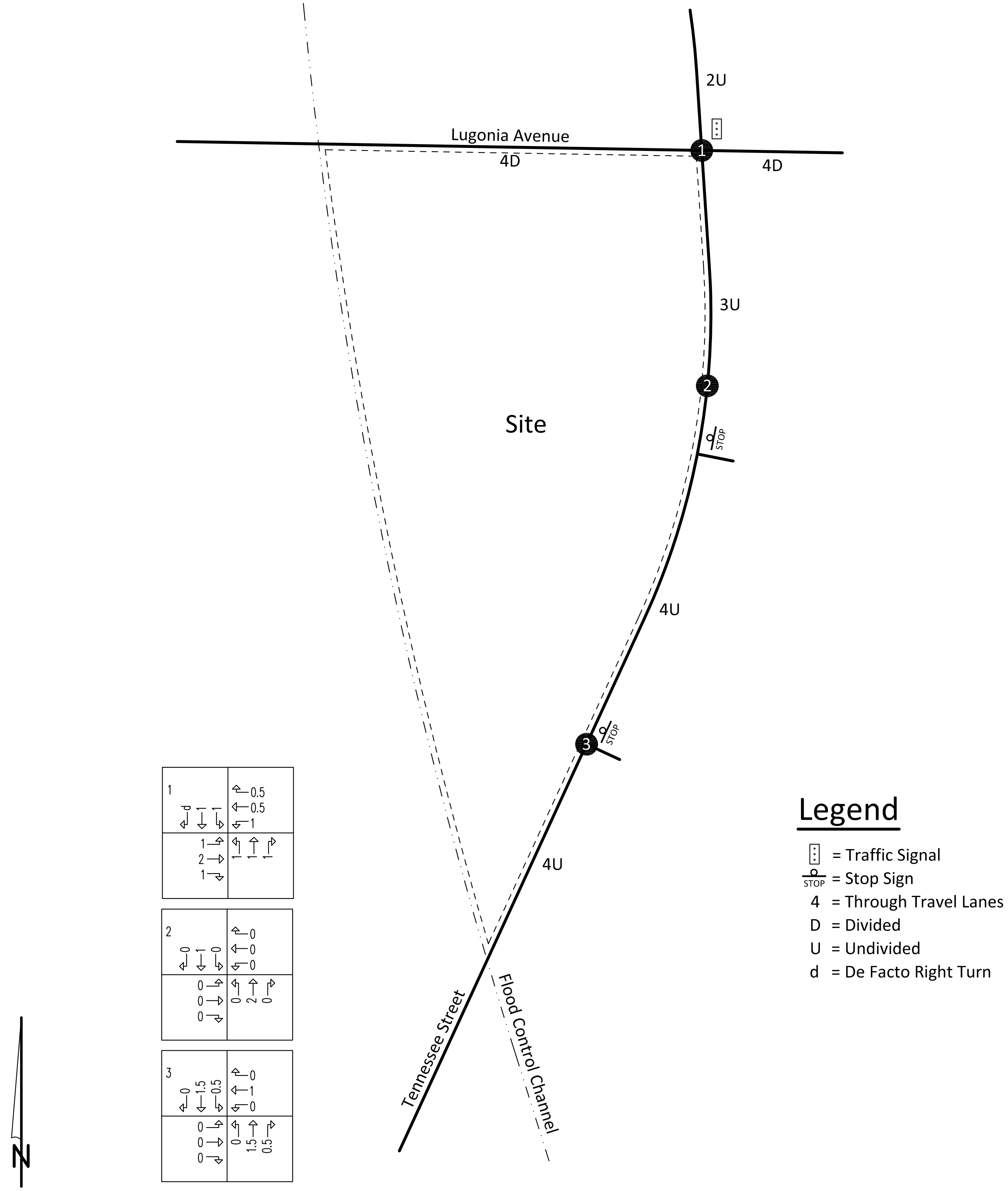
---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

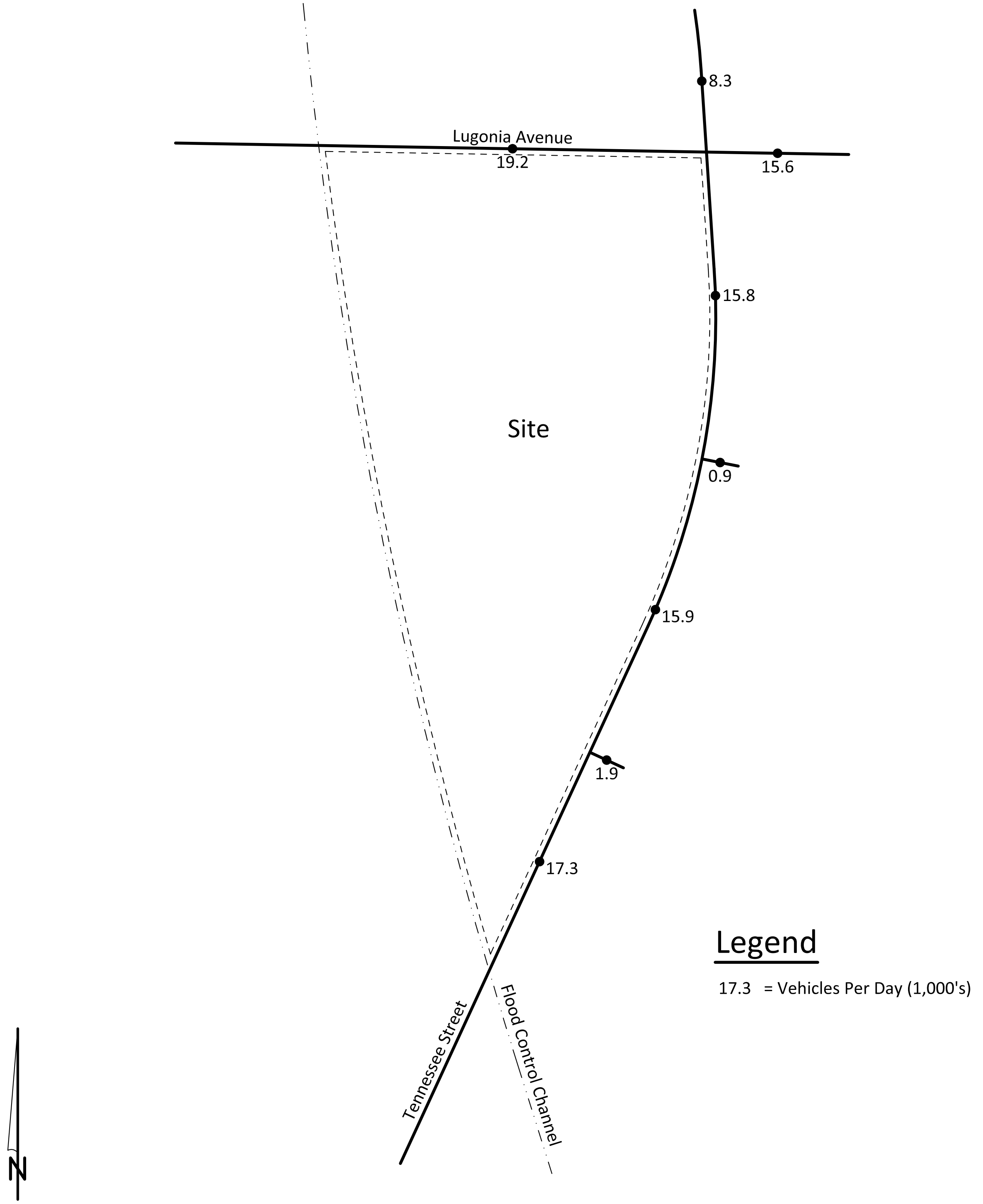
Figure 3
Existing Through Travel Lanes and Intersection Controls



5604/1

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 4
Existing Average Daily Traffic Volumes

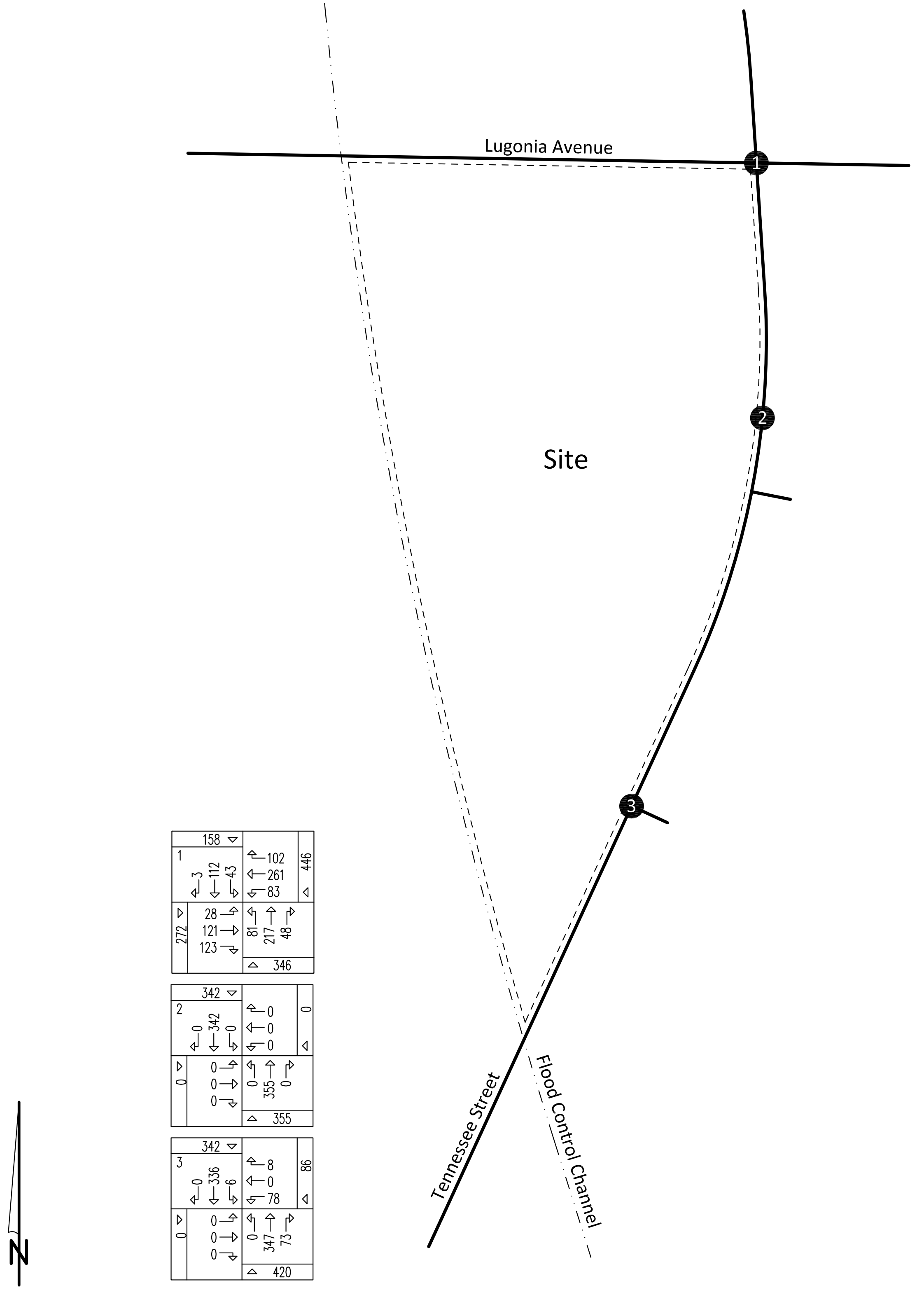


Legend

17.3 = Vehicles Per Day (1,000's)

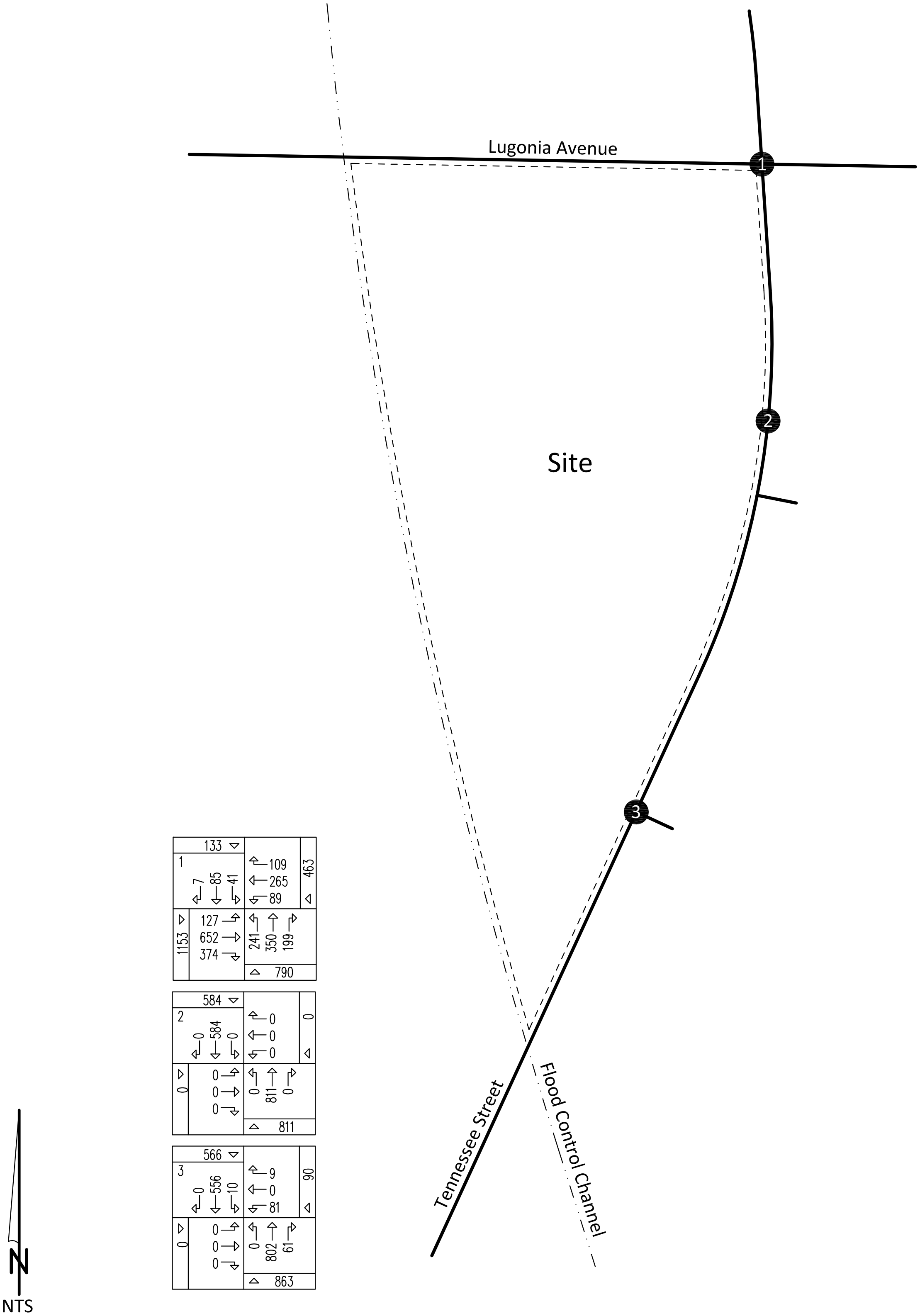
5604/4

Figure 5
Existing Morning Peak Hour Intersection Turning Movement Volumes



Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

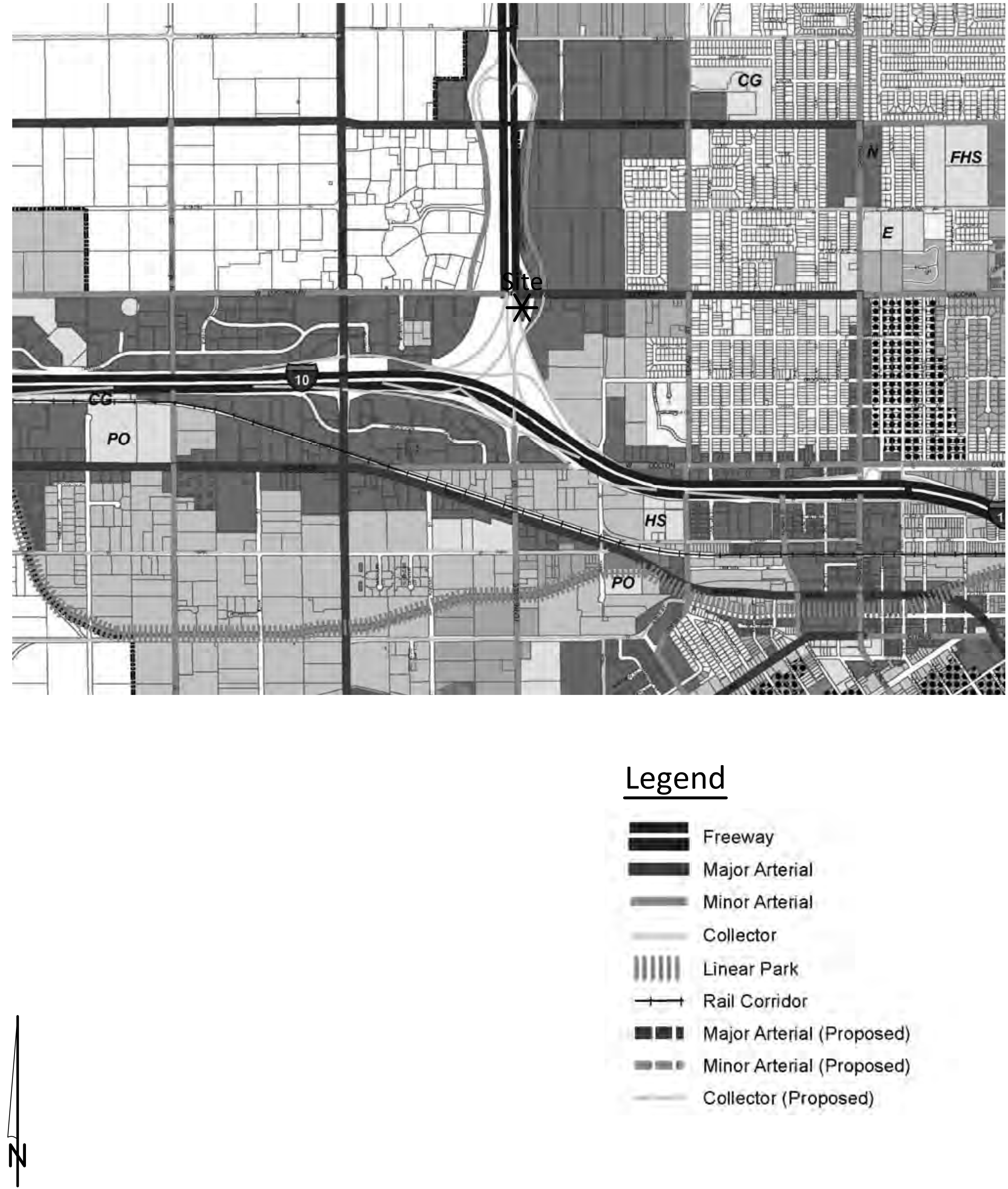
Figure 6
Existing Evening Peak Hour Intersection Turning Movement Volumes



5604/6

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 7
City of Redlands General Plan Circulation Element

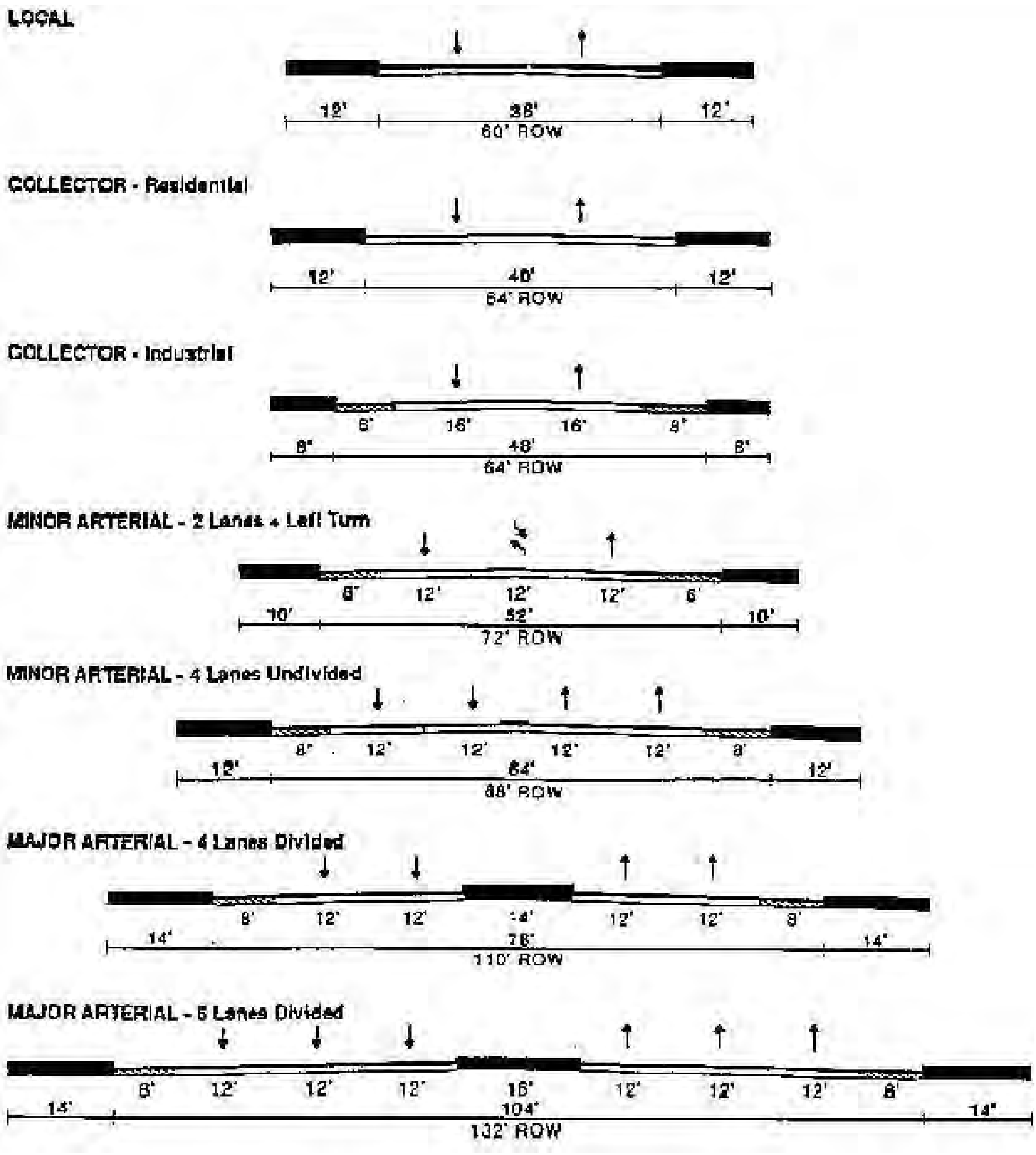


NTS

Source: City of Redlands

5604/7

Figure 8
City of Redlands General Plan Roadway Cross-Sections



Source: City of Redlands

5604/8

III. Project Traffic

A. Project Description

The approximately 1.06 acre project site is proposed to be developed with an automated car wash facility including 8,974 square feet of building area. The project will have access to Tennessee Street.

B. Trip Generation

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and life styles remain similar to what are known today. A major change in these variables may affect trip generation rates.

The trip generation rates for a carwash have been documented by the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012 in Land Use Codes 947 and 948. Land Use Code 947 is based on the number of car washing stalls and Land Use Code 948 is based on the square footage of the car wash or the number of wash stalls.

> Land Use Code 947 is projected to generate approximately (not reported) daily vehicle trips, (not reported) of which will occur during the morning peak hour and 6 of which will occur during the evening peak hour.
>
> Land Use Code 948 is projected to generate approximately (not reported) daily vehicle trips, (not reported) of which will occur during the morning peak hour and 119 or 78 of which will occur during the evening peak hour.
>
> It should be noted that the Institute of Transportation Engineers does not provide a Land Use Code that exactly represents the proposed project and if they did they do not provide the required data to conduct this traffic impact analysis.

The trip generation rates for a carwash have been documented by the San Diego Association of Governments, NOT SO BRIEF GUIDE OF VEHICULAR TRAFFIC GENERATION RATES FOR THE SAN DIEGO REGION, April 2002. The Automatic Carwash Land Use is based on a carwash facility as a whole.

> An Automatic Carwash site is projected to generate approximately 900 daily vehicle trips, 36 of which will occur during the morning peak hour and 82 of which will occur during the evening peak hour.
>
> This trip generation for the site was originally proposed for this analysis but the City of Redlands suggested that the applicants existing facility in the City of Rialto be surveyed to determine the exact trip generation of a nearly identical site.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the trip generation rates by the land use quantity, the traffic volumes are determined. Table 2 shows the project trip generation, which is based upon a manual vehicular count of the existing Matt's Express Car Wash facility located in the City of Rialto on January 16, 2014.

> As shown in Table 2, the proposed development is projected to generate approximately 944 daily vehicle trips, 58 of which will occur during the morning peak hour and 134 of which will occur during the evening peak hour.
>
> As a double check of this data, one week of data from January 2014, February 2014, March 2014, and April 2014 were provided to us by the applicant. This data has been processed to determine the daily, morning peak hour, and evening peak hour traffic volumes.
>
> The minimum average day during a week site generation was 742 daily vehicle trips, 32 of which occurred during the morning peak hour and 50 of which occurred during the evening peak hour.
>
> The average average day during a week site generation was 832 daily vehicle trips, 44 of which occurred during the morning peak hour and 86 of which occurred during the evening peak hour.
>
> The maximum average day during a week site generation was 958 daily vehicle trips, 50 of which occurred during the morning peak hour and 104 of which occurred during the evening peak hour.

It should be noted that the proposed Redlands facility is going to be at a different price point than the Rialto facility. The price of a carwash at the proposed Redlands facility is a 225 percent increase of the price of a carwash at the Rialto facility. The Redlands facility is projected to have less vehicle trips.

The trip generation used in this analysis is a conservative representation of the trips that are likely to be seen at the proposed project site.

C. Trip Distribution

Figures 9 and 10 contain the directional distributions of the project traffic for the proposed land use.

To determine the trip distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

D. Trip Assignment

Based on the identified trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 11. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 12 and 13, respectively.

E. Traffic Contribution Test

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways. Figure 14 graphically depicts the project traffic contribution test volumes on all of the roadway segments adjacent to the potential intersection analysis locations until the project volume contribution has clearly dropped below the 50 trip threshold.

The project does not contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project does not contribute traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the adjacent County of San Bernardino.

Table 2

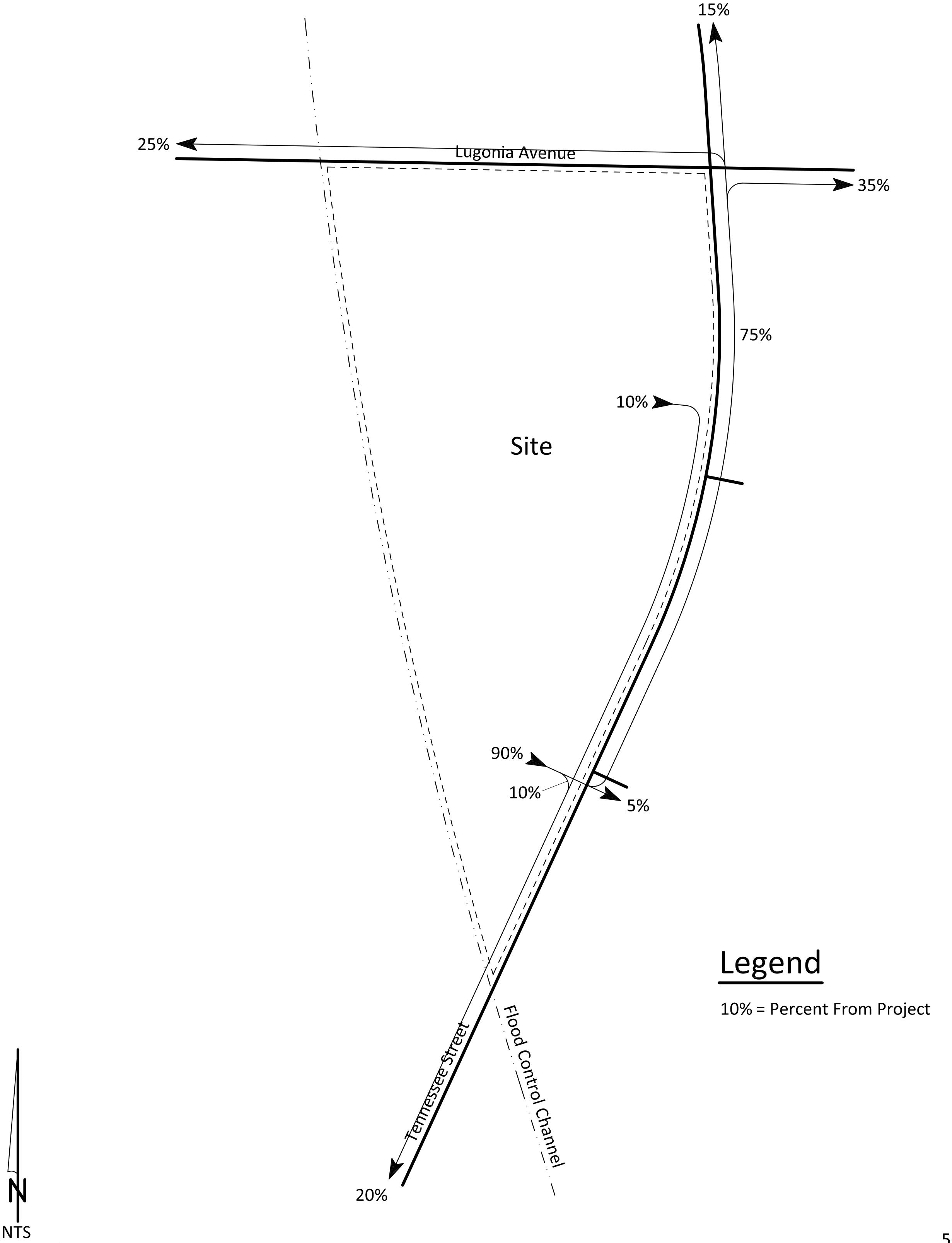
Project Trip Generation[1]

Land Use	Quantity	Units[2]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates Automatic Carwash		Site	29.00	29.00	58.00	67.00	67.00	134.00	944.00
Trips Generated Automatic Carwash	1	Site	29	29	58	67	67	134	944

---

[1] Source: Manual vehicle count of the existing Matt's Express Carwash facility located in the City of Rialto on January 16, 2014.

Figure 9
Project Outbound Trip Distribution

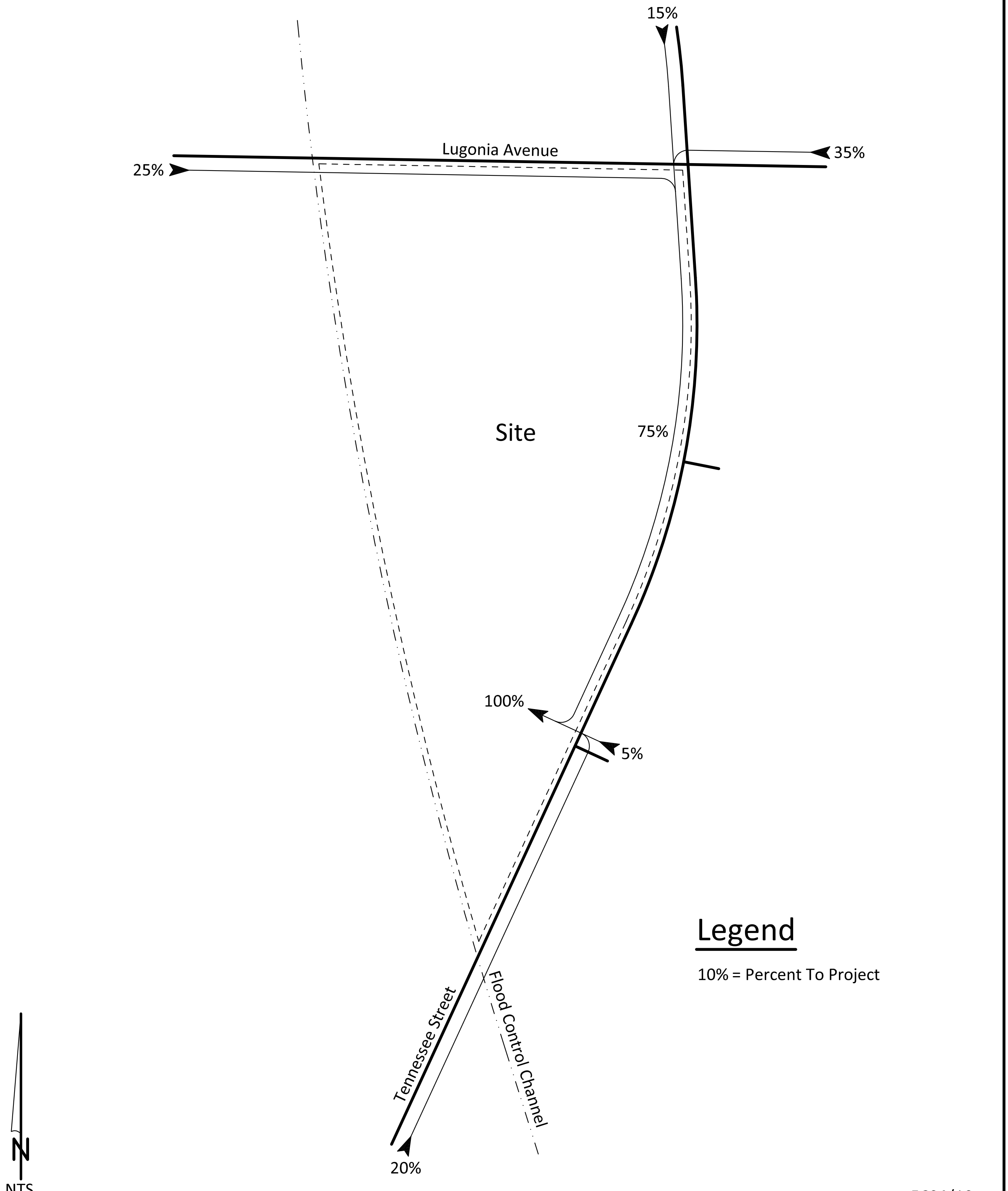


Legend

10% = Percent From Project

5604/9

Figure 10
Project Inbound Trip Distribution



Legend

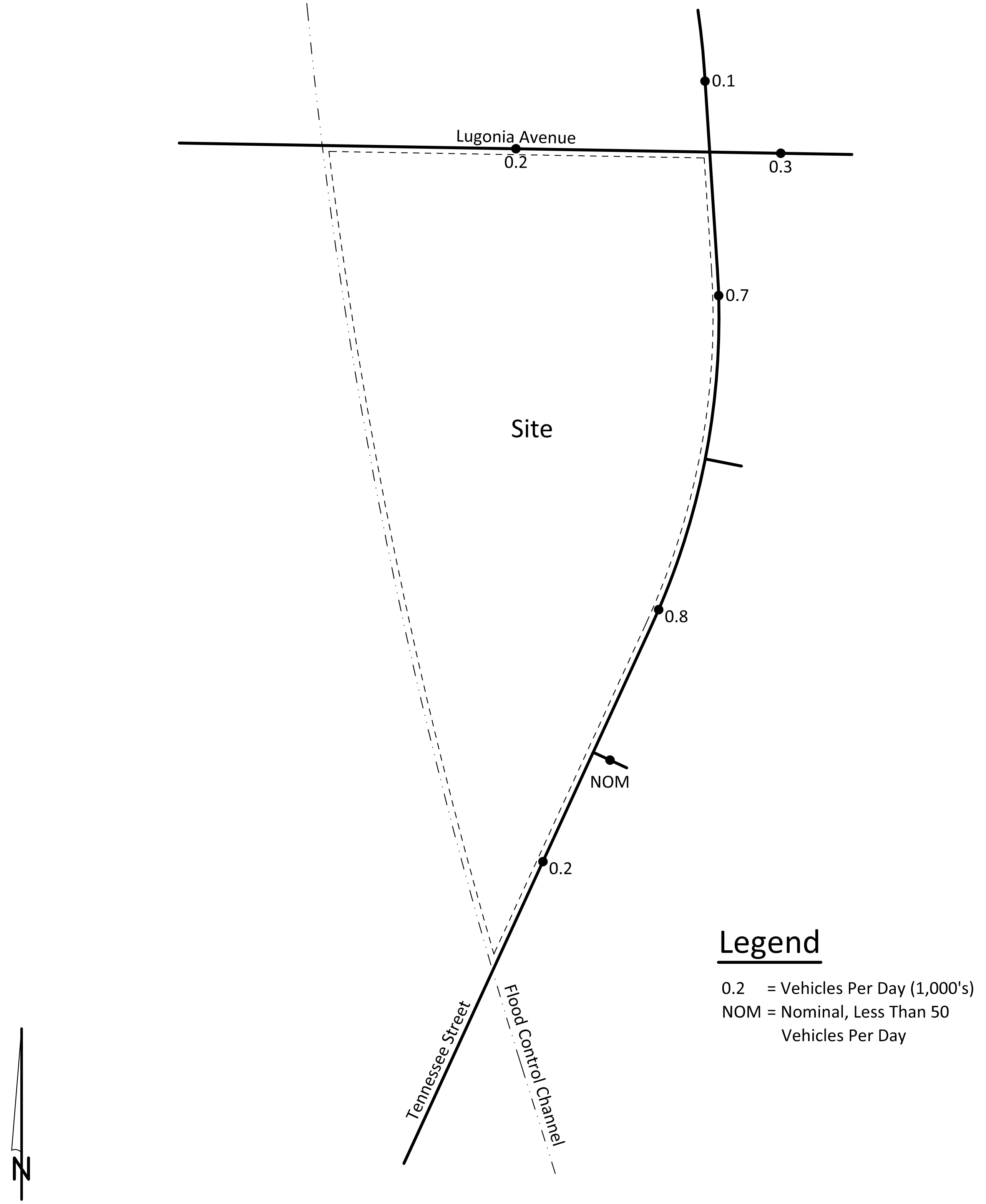
10% = Percent To Project

5604/10

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 11
Project Average Daily Traffic Volumes

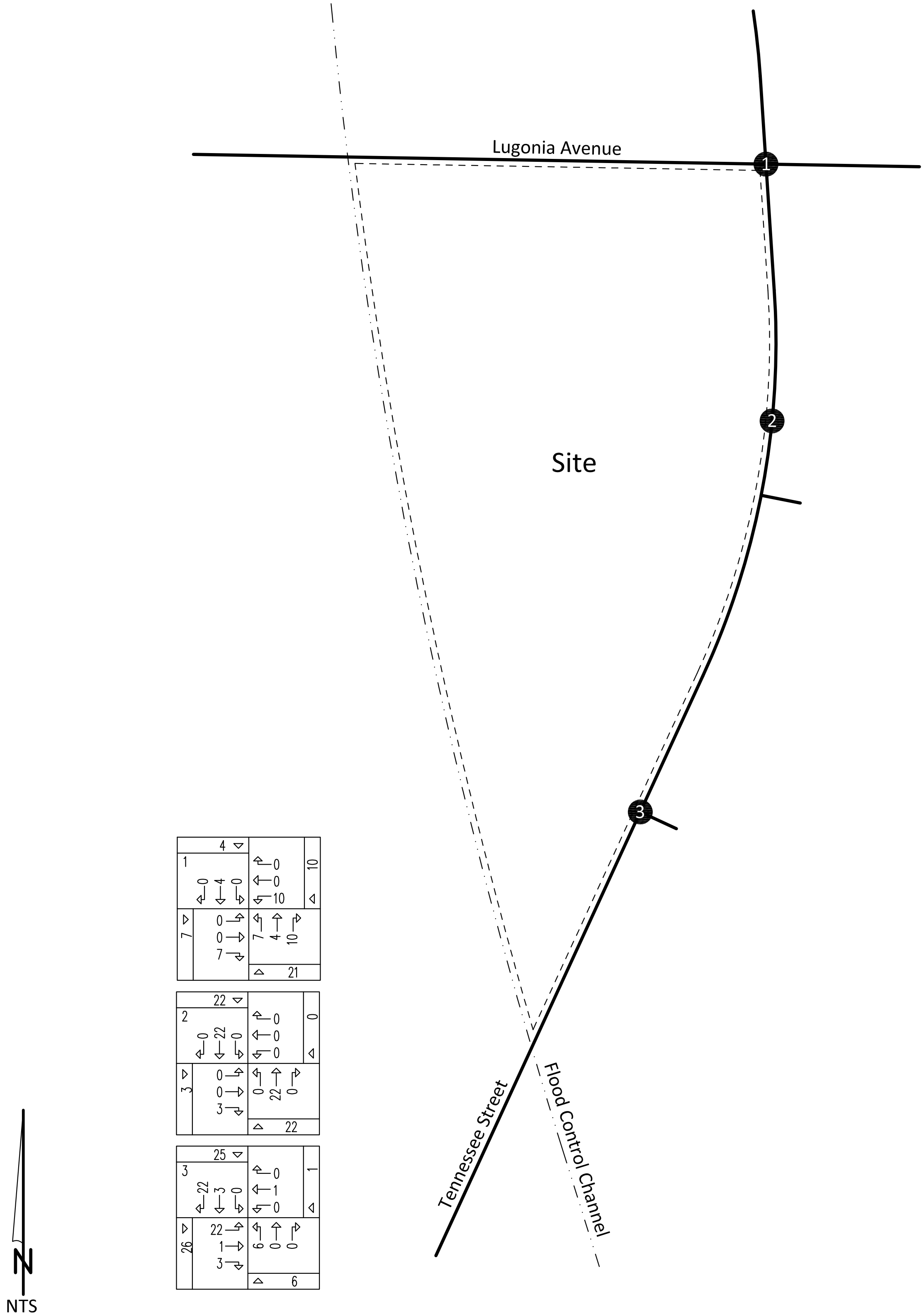


Legend

0.2 = Vehicles Per Day (1,000's)
NOM = Nominal, Less Than 50 Vehicles Per Day

5604/11

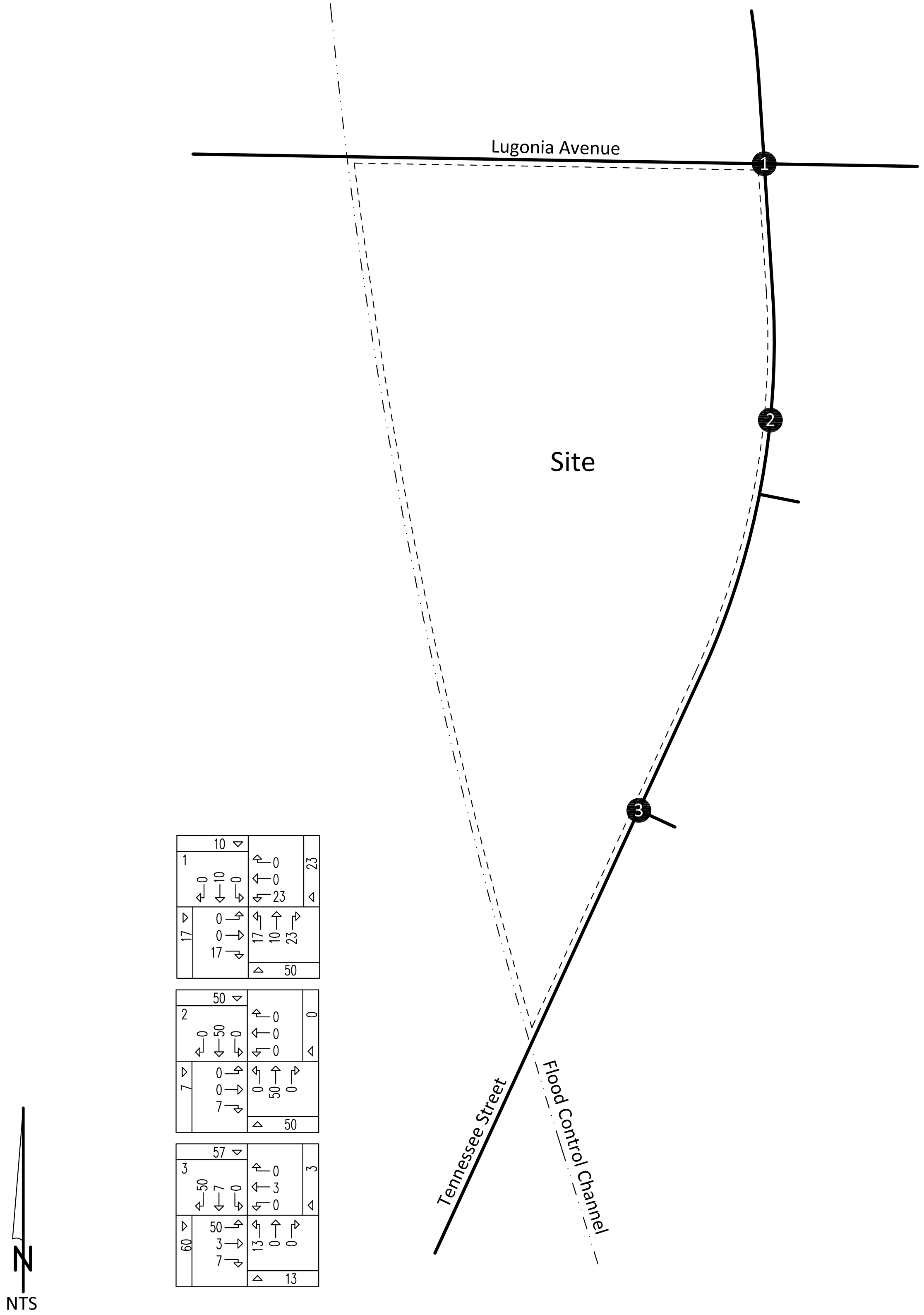
Figure 12
Project Morning Peak Hour Intersection Turning Movement Volumes



5604/12

Intersection reference numbers are in upper left corner of turning movement boxes.

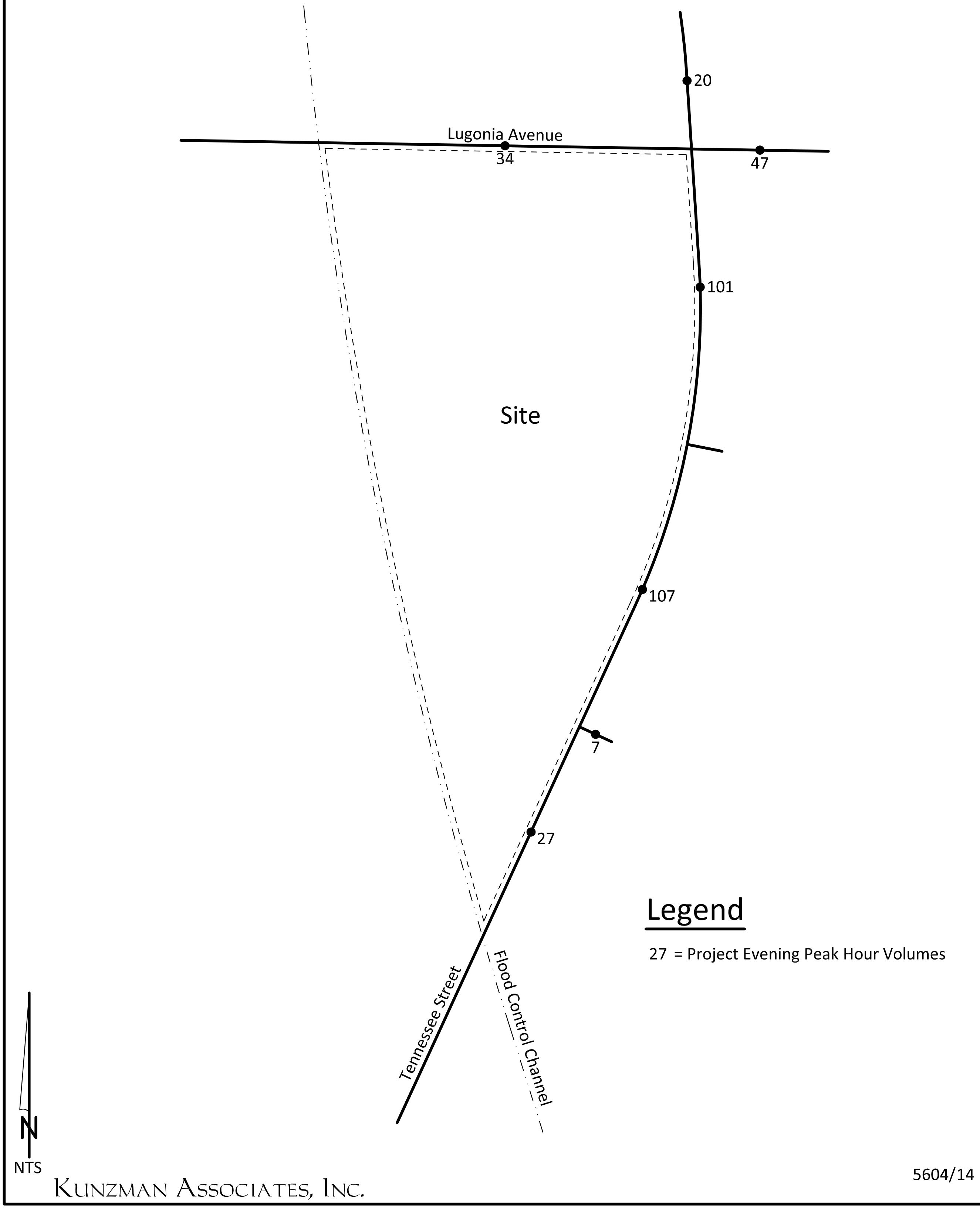
Figure 13
Project Evening Peak Hour Intersection Turning Movement Volumes



5604/13

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 14
Project Contribution Test Volumes



Legend

27 = Project Evening Peak Hour Volumes

IV. Future Conditions

A. Future Volumes

As described within Section I.C., the Year 2035 average daily traffic volume forecasts with the project are developed using a growth increment process based on volumes predicted by the East Valley Traffic Model Year 2000 and Year 2035 traffic models. The growth increment for Year 2035 on each roadway segment is the increase in East Valley Traffic Model volumes from existing Year 2014 to Year 2035. The final Year 2035 roadway segment volume used for analysis purposes is then determined by adding the Year 2035 growth increment volume to the existing counted volume.

The Opening Year (2015) traffic projections have been interpolated between Year 2035 traffic volumes and existing traffic volumes utilizing a portion of the growth increment (see Section I.C.). Project traffic volumes for all future projections were estimated using the manual approach.

1. Existing Plus Project

The average daily traffic volumes for Existing Plus Project traffic conditions have been determined. Existing Plus Project average daily traffic volumes are shown on Figure 15.

2. Opening Year (2015) Without Project

The average daily traffic volumes for Opening Year (2015) Without Project traffic conditions have been determined as described above using the growth interpolation process (see Section I.C.). Opening Year (2015) Without Project average daily traffic volumes are shown on Figure 16.

3. Opening Year (2015) With Project

The average daily traffic volumes for Opening Year (2015) With Project traffic conditions have been determined as described above using the volume addition process (see Section I.C.). Opening Year (2015) With Project average daily traffic volumes are shown on Figure 17.

4. Year 2035 Without Project

The average daily traffic volumes for Year 2035 Without Project traffic conditions have been determined as described above using the growth increment process (see Section I.C.). Year 2035 Without Project average daily traffic volumes are shown on Figure 18.

5. Year 2035 With Project

The average daily traffic volumes for Year 2035 With Project traffic conditions have been determined as described above using the volume addition process (see Section I.C.). Year 2035 With Project average daily traffic volumes are shown on Figure 19.

B. Future Level of Service

1. Existing Plus Project

The Existing Plus Project delay and Level of Service for the study area roadway network are shown in Table 3. Table 3 shows delay values based on the existing geometrics at the study area intersections. Existing Plus Project delay calculation worksheets are provided in Appendix D. Existing Plus Project morning and evening peak hour intersection turning movement volumes are shown on Figures 20 and 21, respectively.

For Existing Plus Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    Project South Access - #3

For Existing Plus Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

2. Opening Year (2015) Without Project

The Opening Year (2015) Without Project delay and Level of Service for the study area roadway network without the proposed project are shown in Table 4. Table 4 shows delay values based on the existing geometrics at the study area intersections. Opening Year (2015) Without Project delay calculation worksheets are provided in Appendix D. Opening Year (2015) Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 22 and 23, respectively.

For Opening Year (2015) Without Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    South Project Access - #3

For Opening Year (2015) Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

3. Opening Year (2015) With Project

The Opening Year (2015) With Project delay and Level of Service for the study area roadway network with the proposed project are shown in Table 5. Table 5 shows delay values based on the existing geometrics at the study area intersections. Opening Year (2015) With Project delay calculation worksheets are provided in Appendix D. Opening Year (2015) With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 24 and 25, respectively.

For Opening Year (2015) With Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hours:

Tennessee Street (NS) at:
    South Project Access - #3

For Opening Year (2015) With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

4. Year 2035 Without Project

The Year 2035 delay and Level of Service for the study area roadway network without the proposed project are shown in Table 6. Table 6 shows delay values based on the existing geometrics at the study area intersections. Year 2035 Without Project delay calculation worksheets are provided in Appendix D. Year 2035 Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 26 and 27, respectively.

For Year 2035 Without Project traffic conditions, the following study area intersections are projected to operate at unacceptable Levels of Service during the peak hours:

Tennessee Street (NS) at:
    Lugonia Avenue - #1
    Project South Access - #3

For Year 2035 Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

5. Year 2035 With Project

The Year 2035 With Project delay and Level of Service for the study area roadway network with the proposed project are shown in Table 7. Table 7 shows delay values based on the existing geometrics at the study area intersections. Year 2035 With Project delay calculation worksheets are provided in Appendix D. Year 2035 With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 28 and 29, respectively.

For Year 2035 With Project traffic conditions, the following study area intersections are projected to operate at unacceptable Levels of Service during the peak hours:

- Tennessee Street (NS) at:
    - Lugonia Avenue - #1
    - Project South Access - #3

For Year 2035 With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

Table 3

Existing Plus Project Intersection Delay and Level of Service

		Intersection Approach Lanes[1]												Peak Hour	
	Traffic	Northbound			Southbound			Eastbound			Westbound			Delay-LOS[2]	
Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	27.1-C	36.7-D
Project Project Access (EW) - #2	**CSS**	0	2	0	0	1	0	0	0	**1**	0	0	0	10.4-B	12.9-B
Project South Access (EW) - #3															
- Without Improvements	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	19.2-C	68.3-F
- With Improvements - No Traffic Signal	CSS	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	19.2-C	68.2-F
- With Improvements - Traffic Signal	**TS**	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	8.0-A	7.9-A

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn' **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

Table 4

Opening Year (2015) Without Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	27.5-C	36.0-D
Project South Access (EW) - #3															
- Without Improvements	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	17.3-C	42.2-E
- With Improvements	**TS**	0	1.5	0.5	**1**	2	0	0	0	0	0	1	0	7.7-A	6.8-A

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn'**1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

Table 5

Opening Year (2015) With Project Intersection Delay and Level of Service

		Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
	Traffic	Northbound			Southbound			Eastbound			Westbound				
Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	27.8-C	37.7-D
Project North Access (EW) - #2	**CSS**	0	2	0	0	1	0	0	0	**1**	0	0	0	10.4-B	13.2-B
Project South Access (EW) - #3															
- Without Improvements	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	20.7-C	82.3-F
- With Improvements - No Traffic Signal	CSS	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	20.7-C	82.1-F
- With Improvements - Traffic Signal	**TS**	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	8.1-A	7.9-A

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn' **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

Table 6

Year 2035 Without Project Intersection Delay and Level of Service

		Intersection Approach Lanes[1]												Peak Hour	
	Traffic	Northbound			Southbound			Eastbound			Westbound			Delay-LOS[2]	
Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1															
- Without Improvements	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	46.3-D	64.3-E
- With Improvements	**TS**[4]	1	1	1	1	1	d	1	2	1	1	0.5	0.5	43.5-D	49.9-D
Project South Access (EW) - #3															
- Without Improvements	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	53.2-F	99.9-F[5]
- With Improvements	**TS**	0	1.5	0.5	**1**	2	0	0	0	0	0	1	0	2.8-A	2.2-A

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn; **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] Traffic signal improvements proposed.

[5] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Table 7

Year 2035 With Project Intersection Delay and Level of Service

		Intersection Approach Lanes[1]												Peak Hour	
	Traffic	Northbound			Southbound			Eastbound			Westbound			Delay-LOS[2]	
Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tennessee Street (NS) at:															
Lugonia Avenue (EW) - #1															
- Without Improvements	TS	1	1	1	1	1	d	1	2	1	1	0.5	0.5	46.8-D	70.6-E
- With Improvements	**TS**[4]	1	1	1	1	1	d	1	2	1	1	0.5	0.5	44.0-D	43.3-D
Project North Access (EW) - #2	**CSS**	0	2	0	0	1	0	0	0	**1**	0	0	0	11.4-B	19.4-C
Project South Access (EW) - #3															
- Without Improvements	CSS	0	1.5	0.5	0.5	1.5	0	0	0	0	0	1	0	98.1-F	99.9-F[5]
- With Improvements - No Traffic Signal	CSS	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	98.0-F	99.9-F
- With Improvements - Traffic Signal	**TS**	**1**	1.5	0.5	**1**	1.5	0.5	0	**1**	0	0	1	0	3.3-A	3.0-A

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = Defacto Right Turn' **1** = Improvement

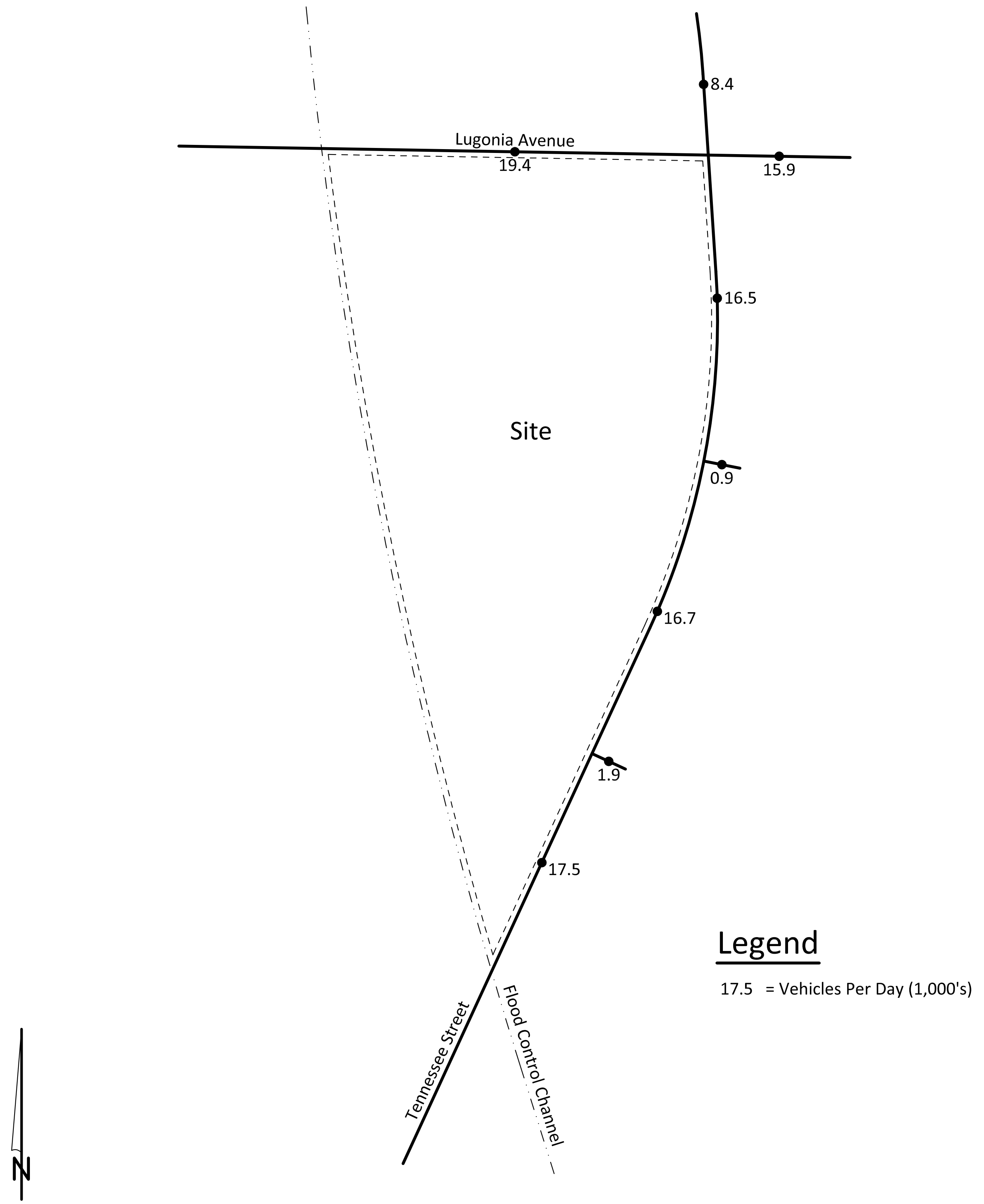
[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9.0215. Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] Traffic signal improvements proposed.

[5] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Figure 15
Existing Plus Project Average Daily Traffic Volumes



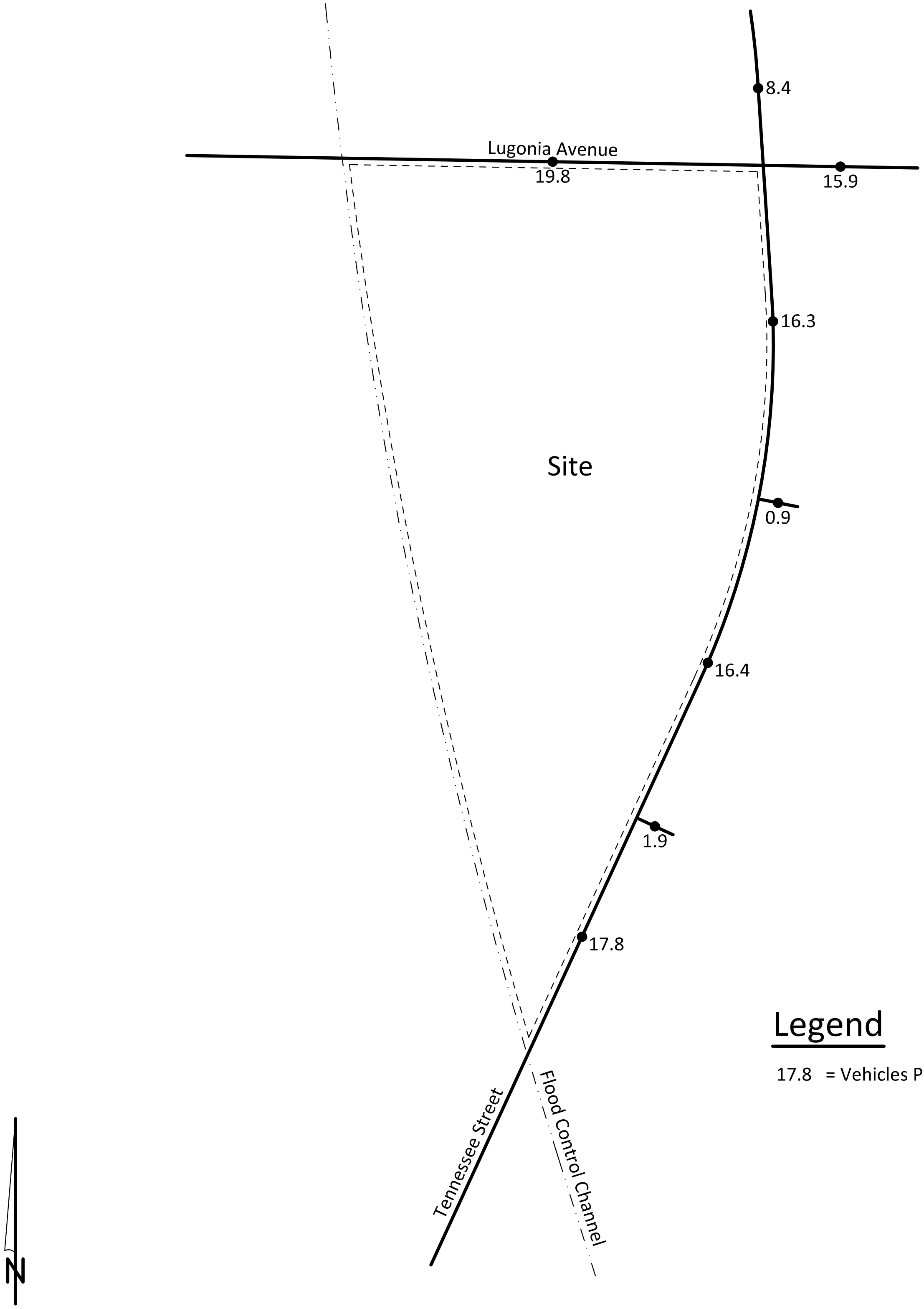
Legend

17.5 = Vehicles Per Day (1,000's)

5604/15

Figure 16

Opening Year (2015) Without Project Average Daily Traffic Volumes



Legend

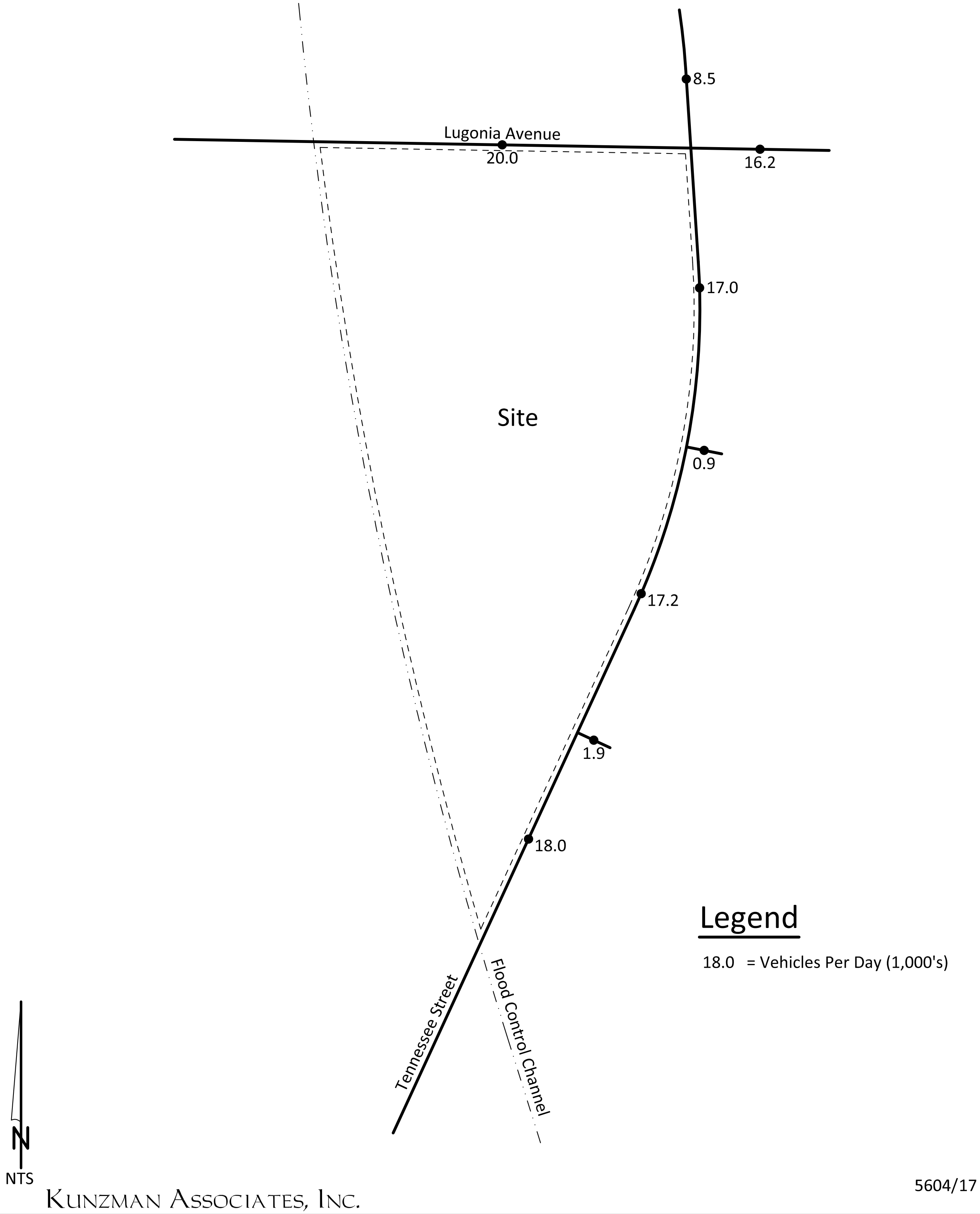
17.8 = Vehicles Per Day (1,000's)

5604/16

Kunzman Associates, Inc.

Over 35 Years of Excellent Service

Figure 17
Opening Year (2015) With Project Average Daily Traffic Volumes

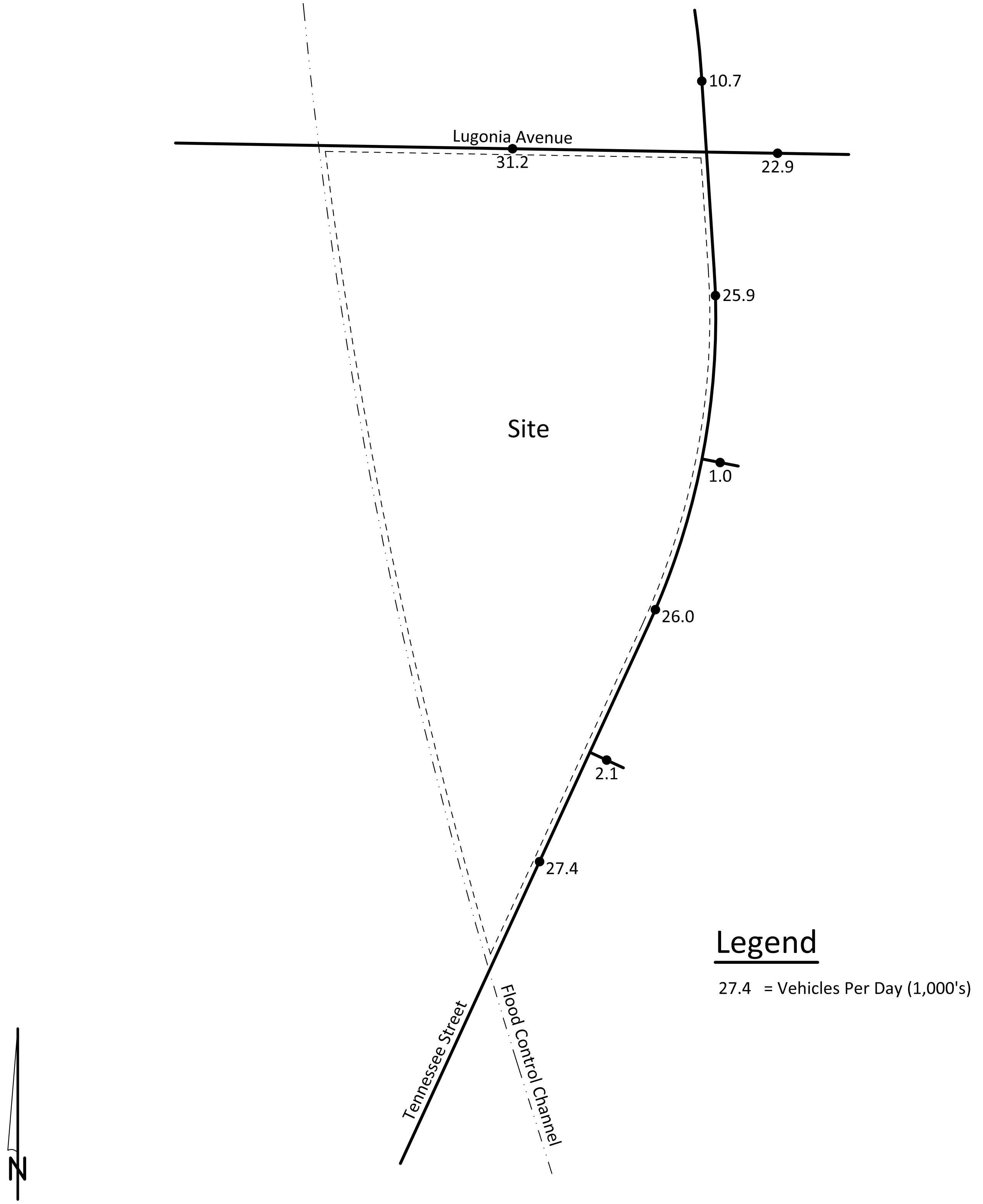


Legend

18.0 = Vehicles Per Day (1,000's)

5604/17

Figure 18
Year 2035 Without Project Average Daily Traffic Volumes

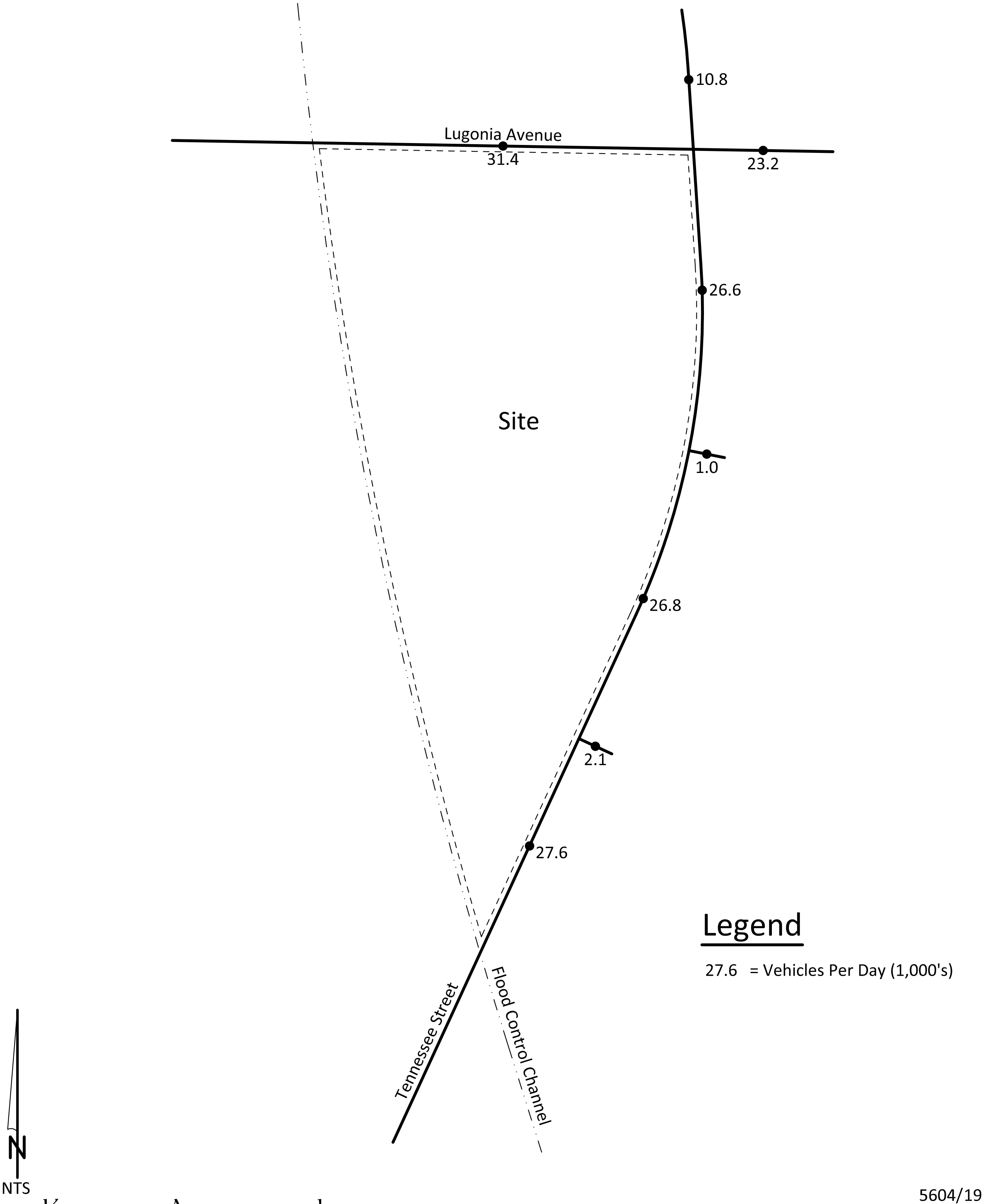


Legend

27.4 = Vehicles Per Day (1,000's)

5604/18

Figure 19
Year 2035 With Project Average Daily Traffic Volumes

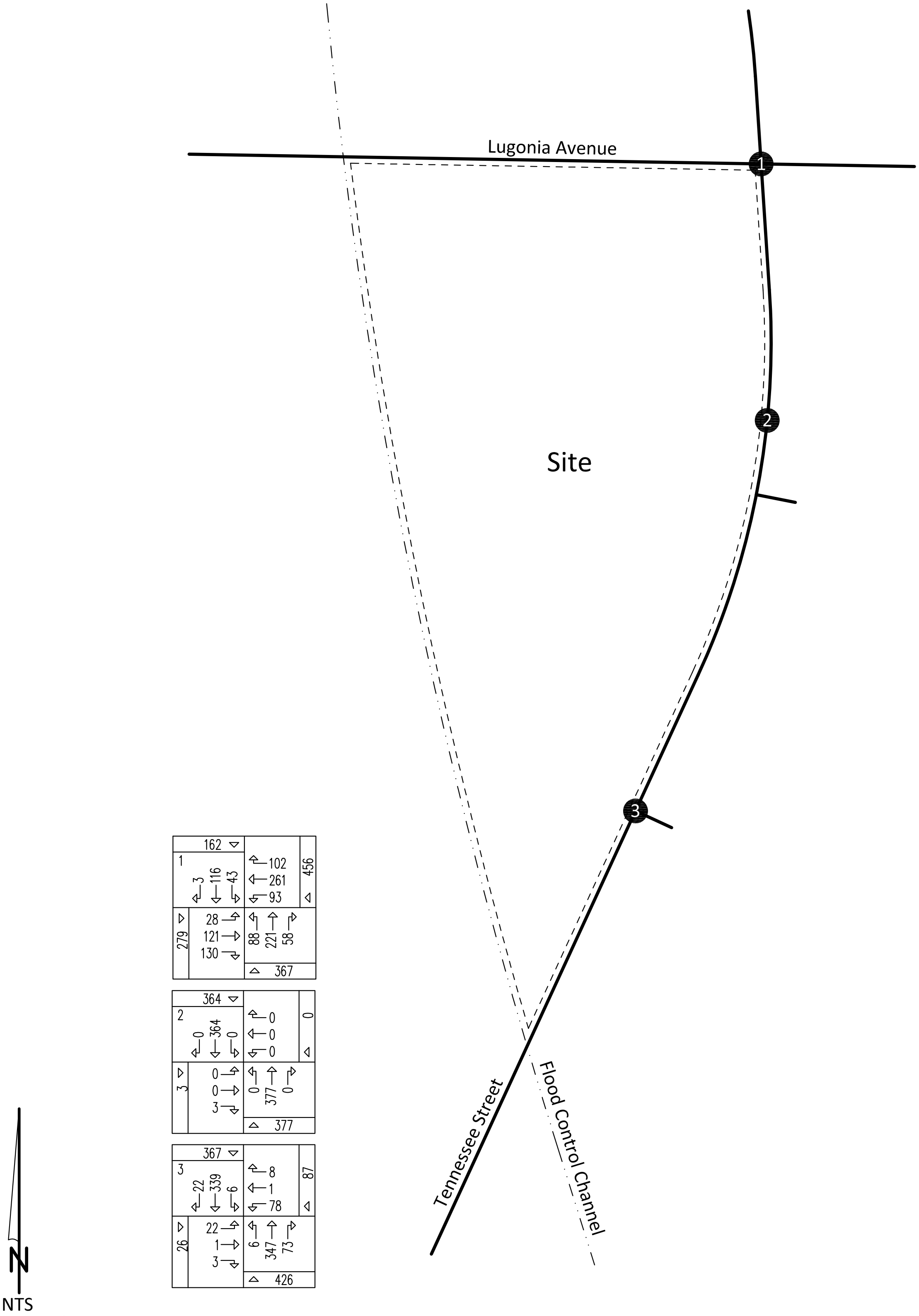


Legend

27.6 = Vehicles Per Day (1,000's)

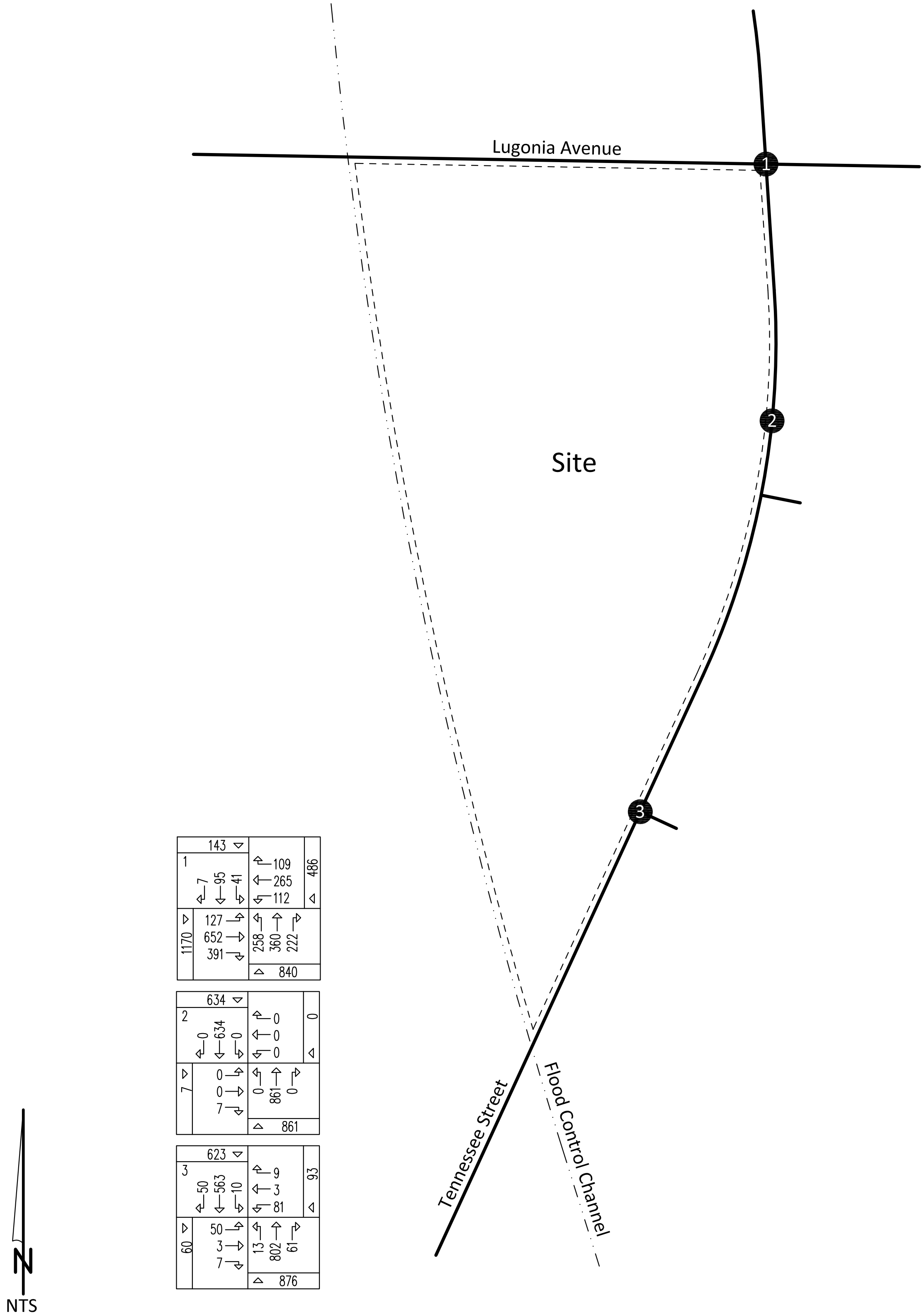
5604/19

Figure 20
Existing Plus Project
Morning Peak Hour Intersection Turning Movement Volumes



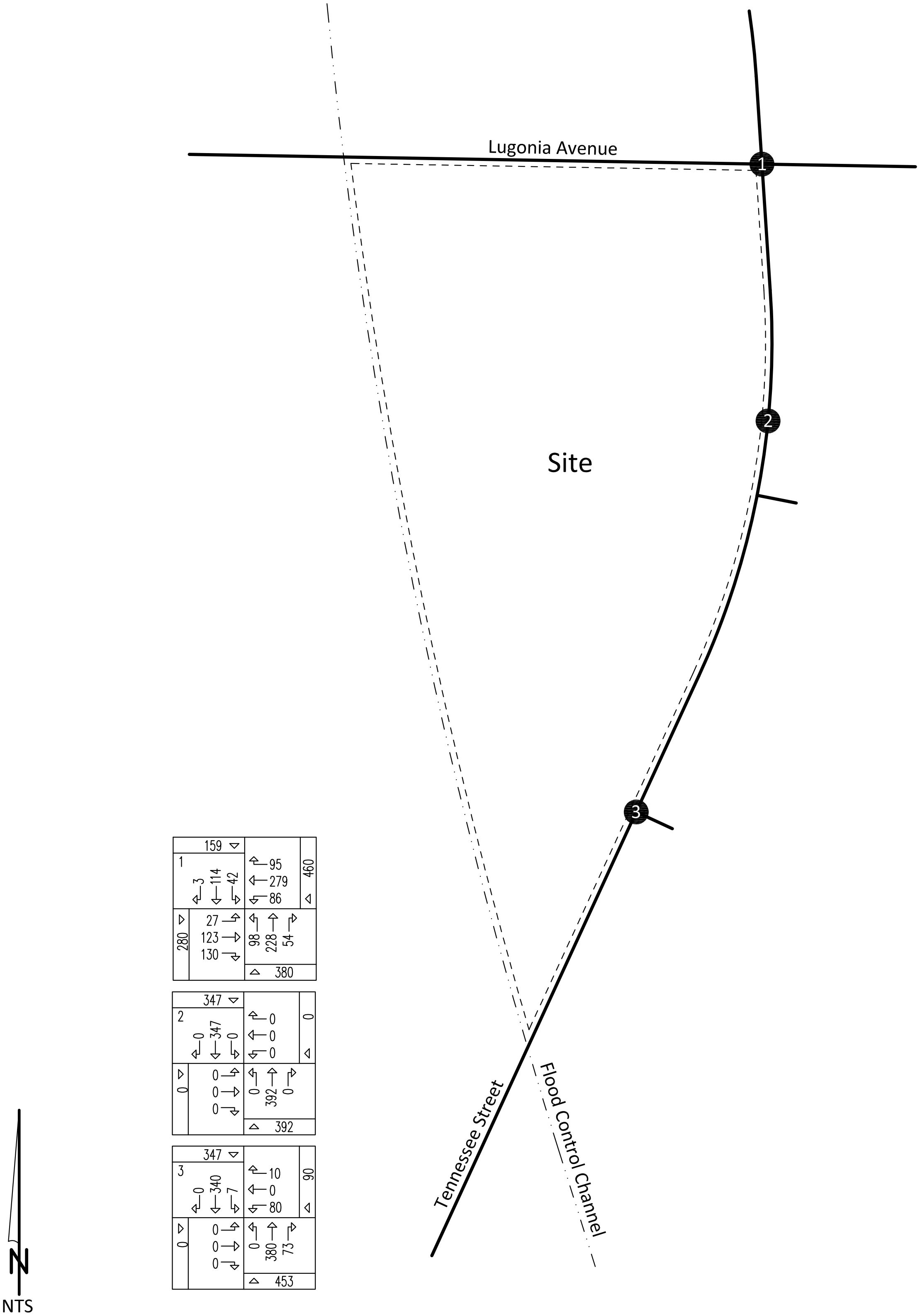
Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 21
Existing Plus Project
Evening Peak Hour Intersection Turning Movement Volumes



Intersection reference numbers are in upper left corner of turning movement boxes.

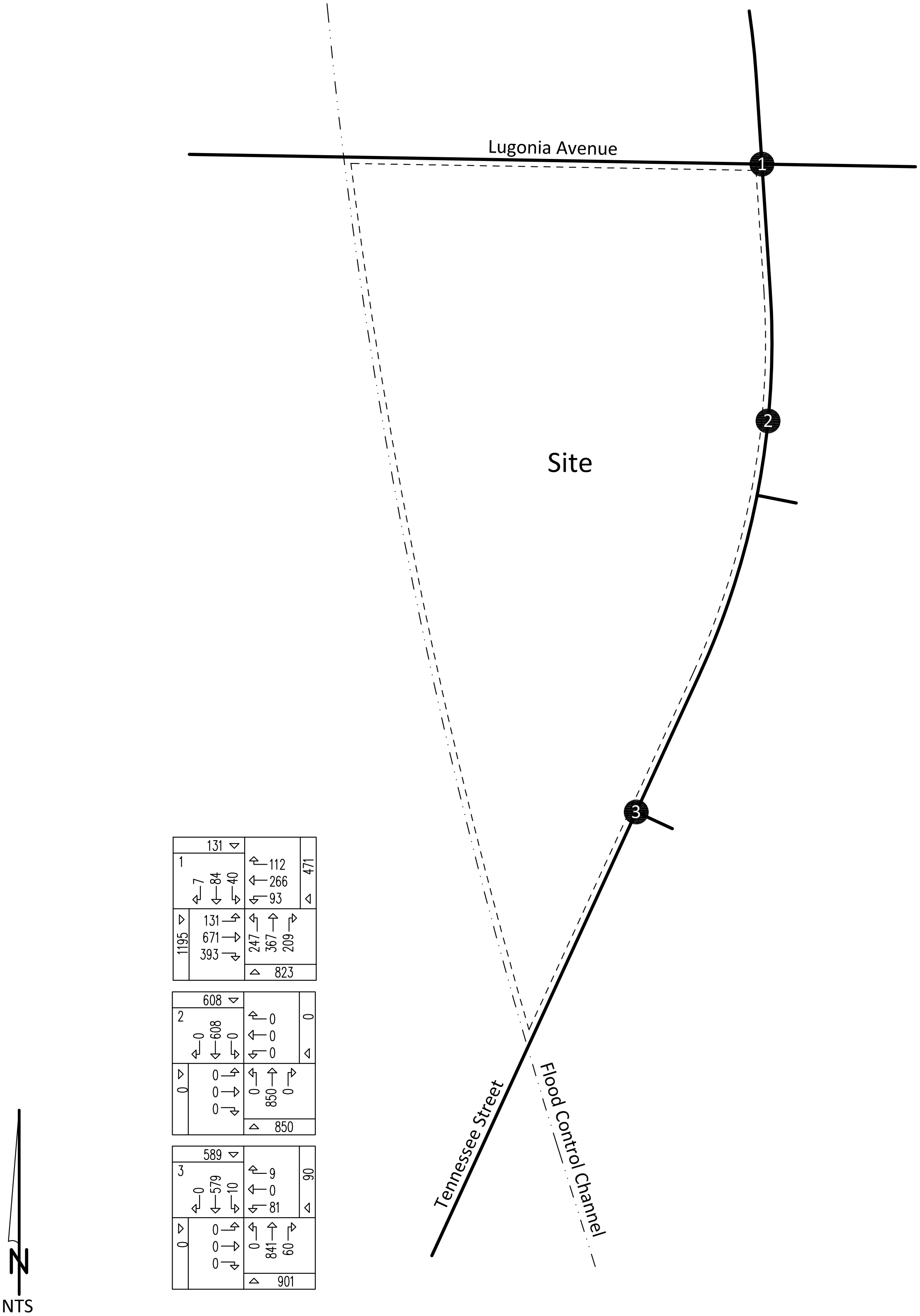
Figure 22
Opening Year (2015) Without Project
Morning Peak Hour Intersection Turning Movement Volumes



5604/22

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 23
Opening Year (2015) Without Project
Evening Peak Hour Intersection Turning Movement Volumes

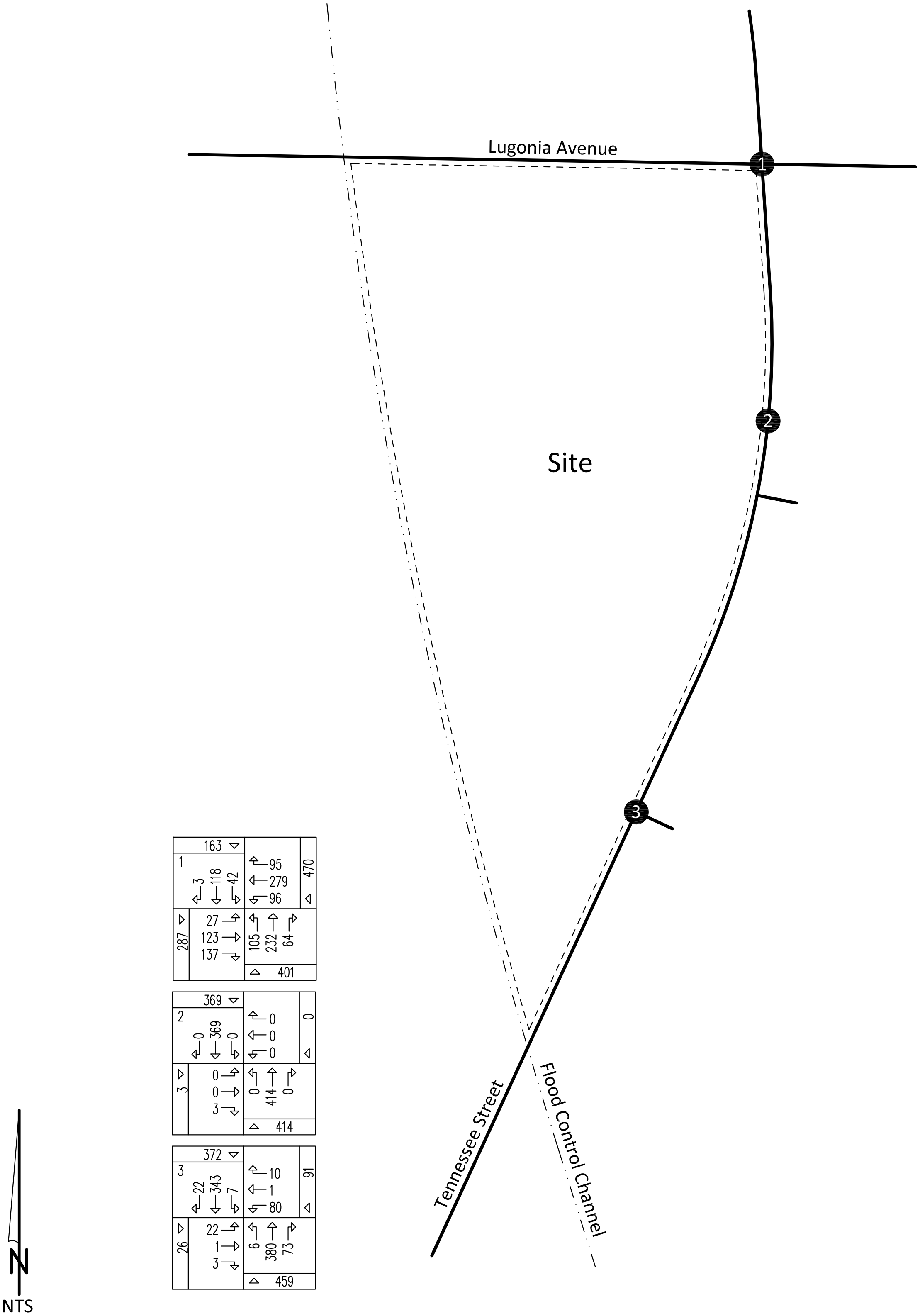


5604/23

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

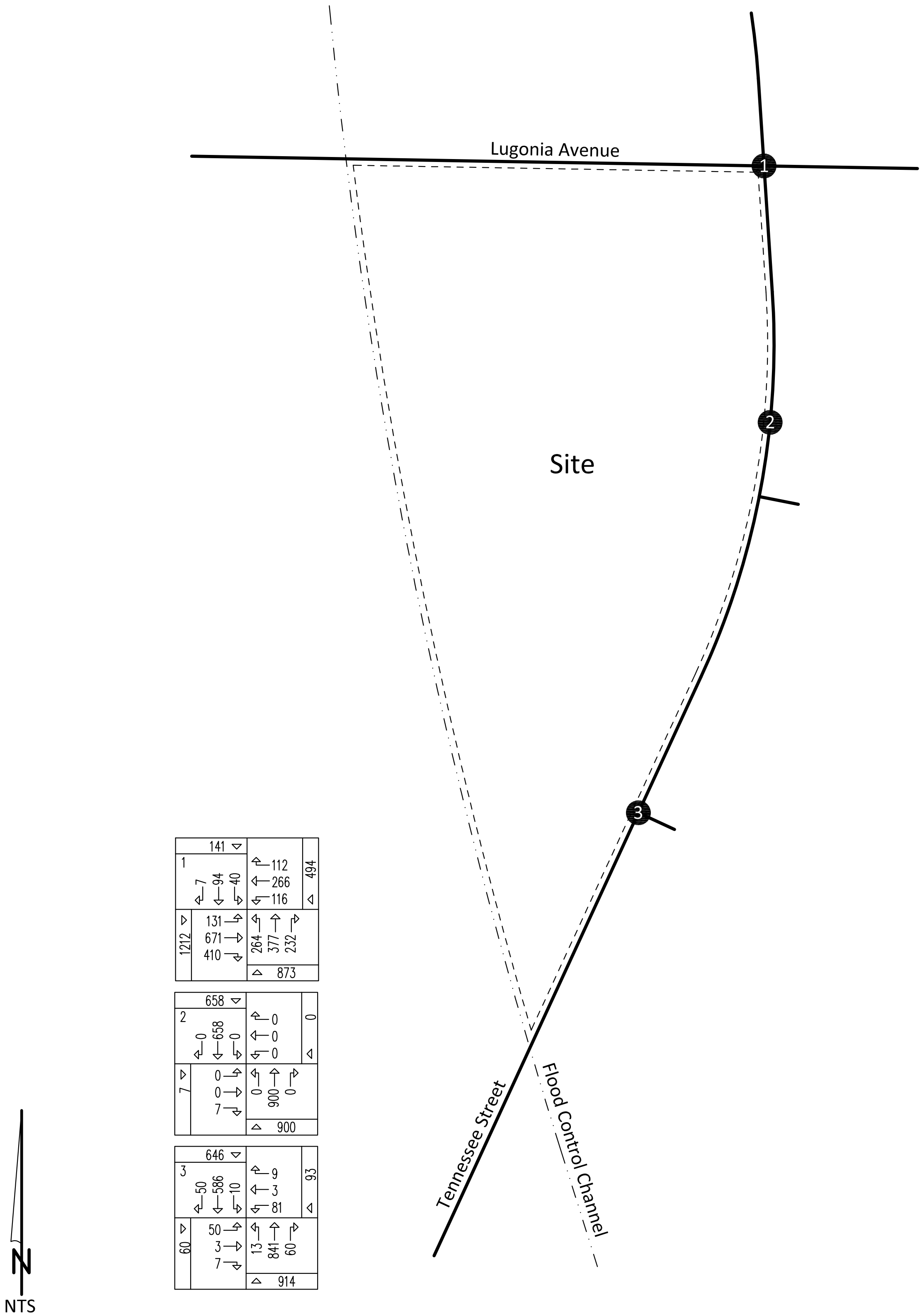
Figure 24
Opening Year (2015) With Project
Morning Peak Hour Intersection Turning Movement Volumes



5604/24

Intersection reference numbers are in upper left corner of turning movement boxes.

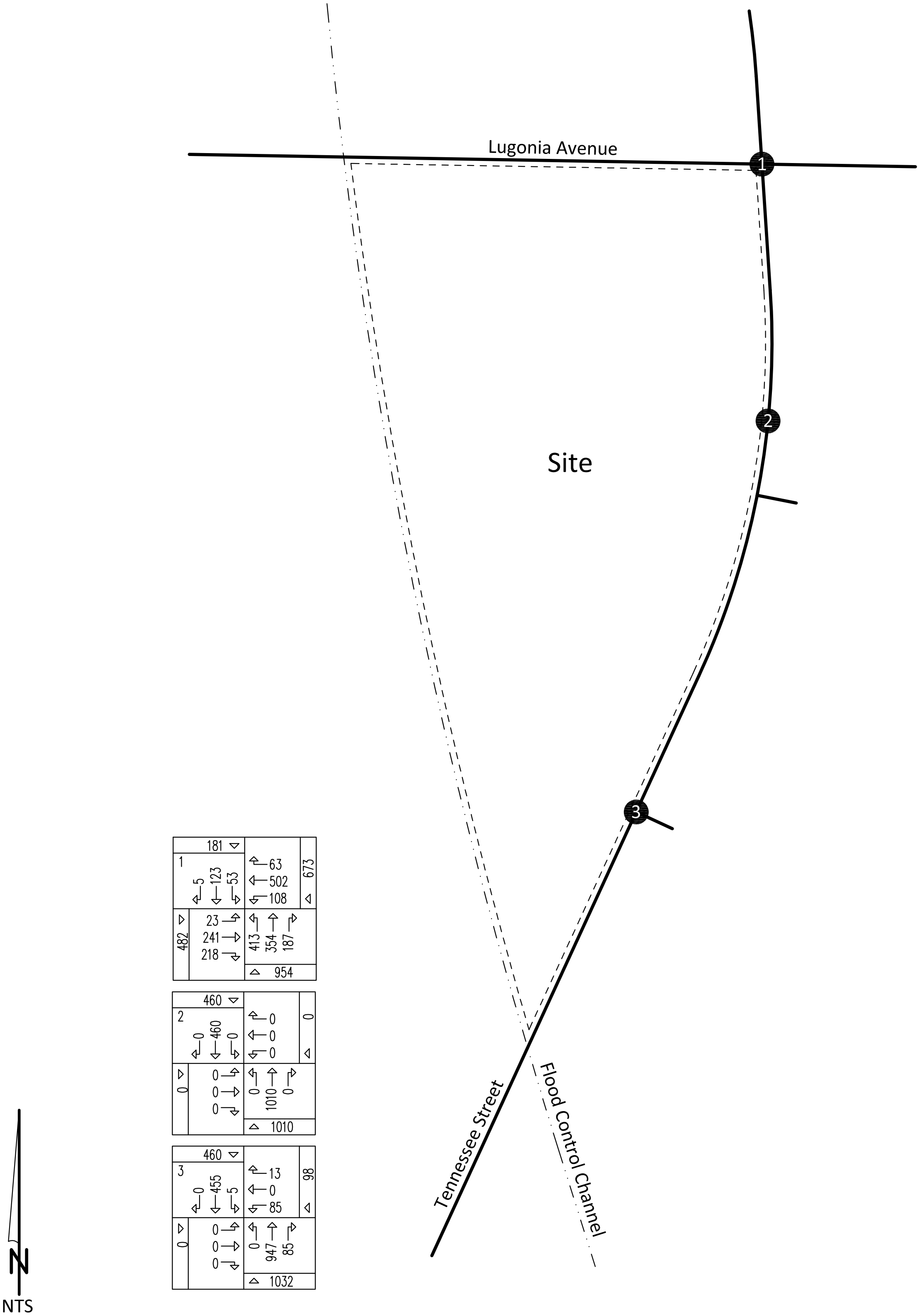
Figure 25
Opening Year (2015) With Project
Evening Peak Hour Intersection Turning Movement Volumes



5604/25

Intersection reference numbers are in upper left corner of turning movement boxes.

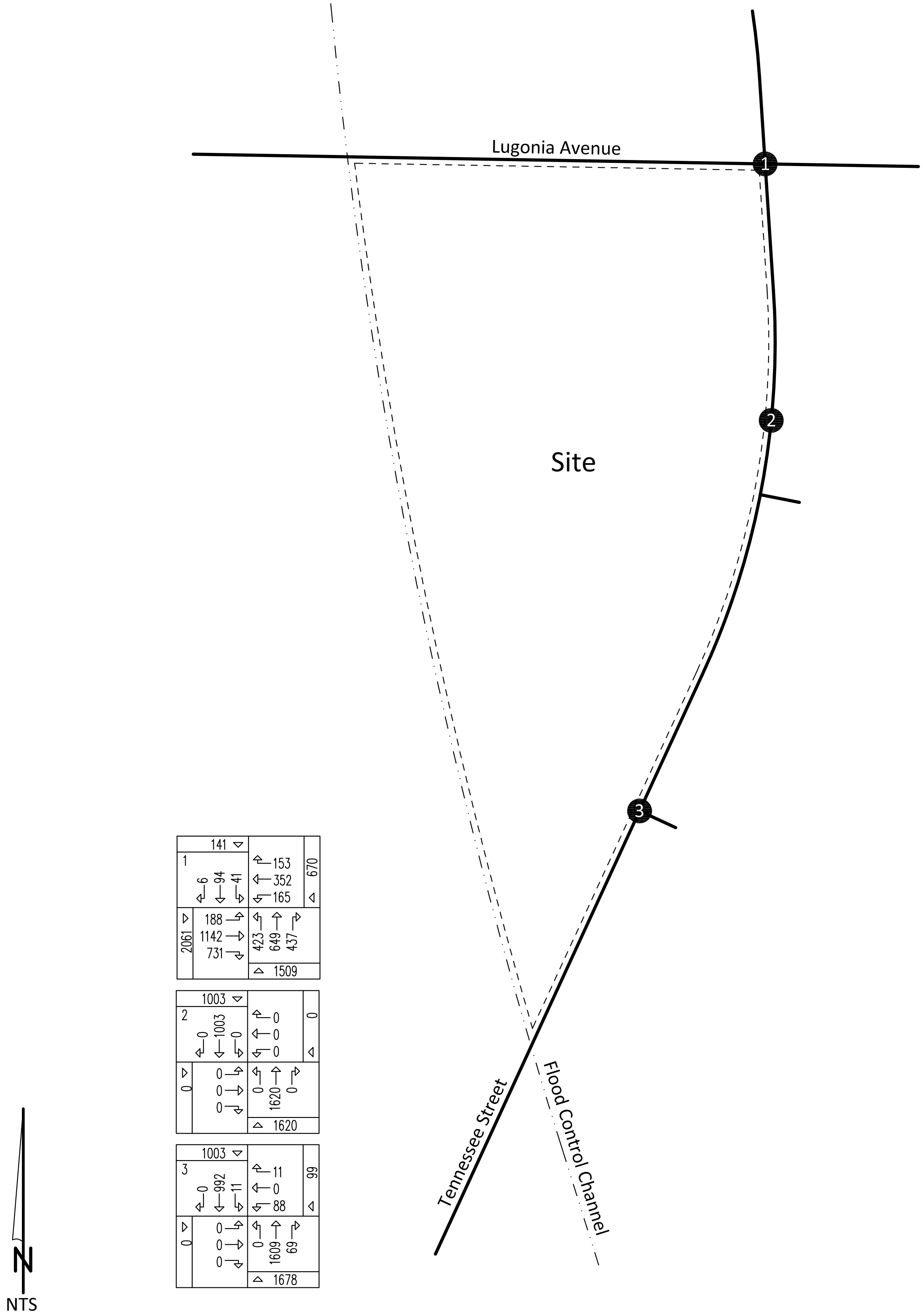
Figure 26
Year 2035 Without Project
Morning Peak Hour Intersection Turning Movement Volumes



5604/26

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 27
Year 2035 Without Project
Evening Peak Hour Intersection Turning Movement Volumes

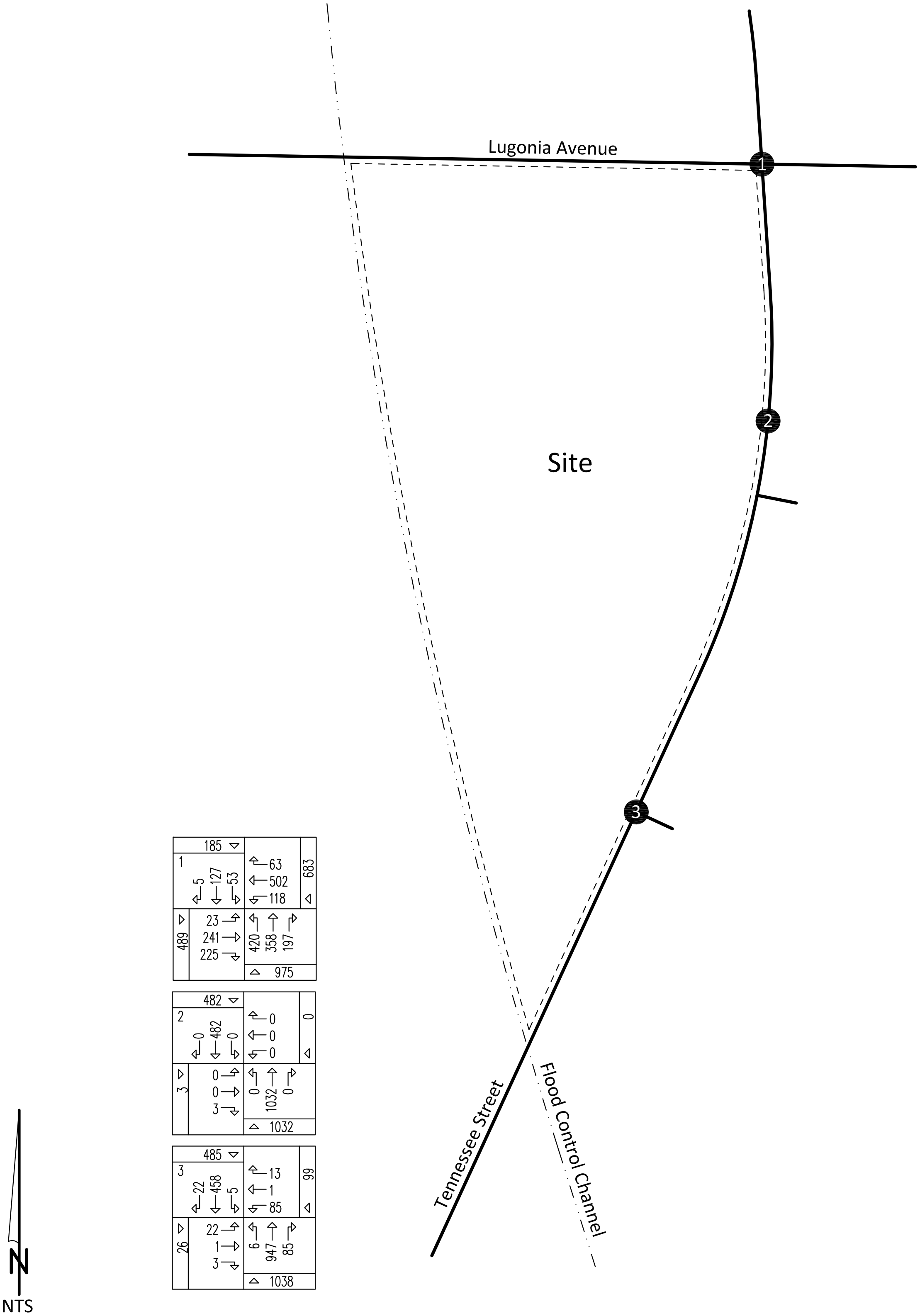


5604/27

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Over 35 Years of Excellent Service

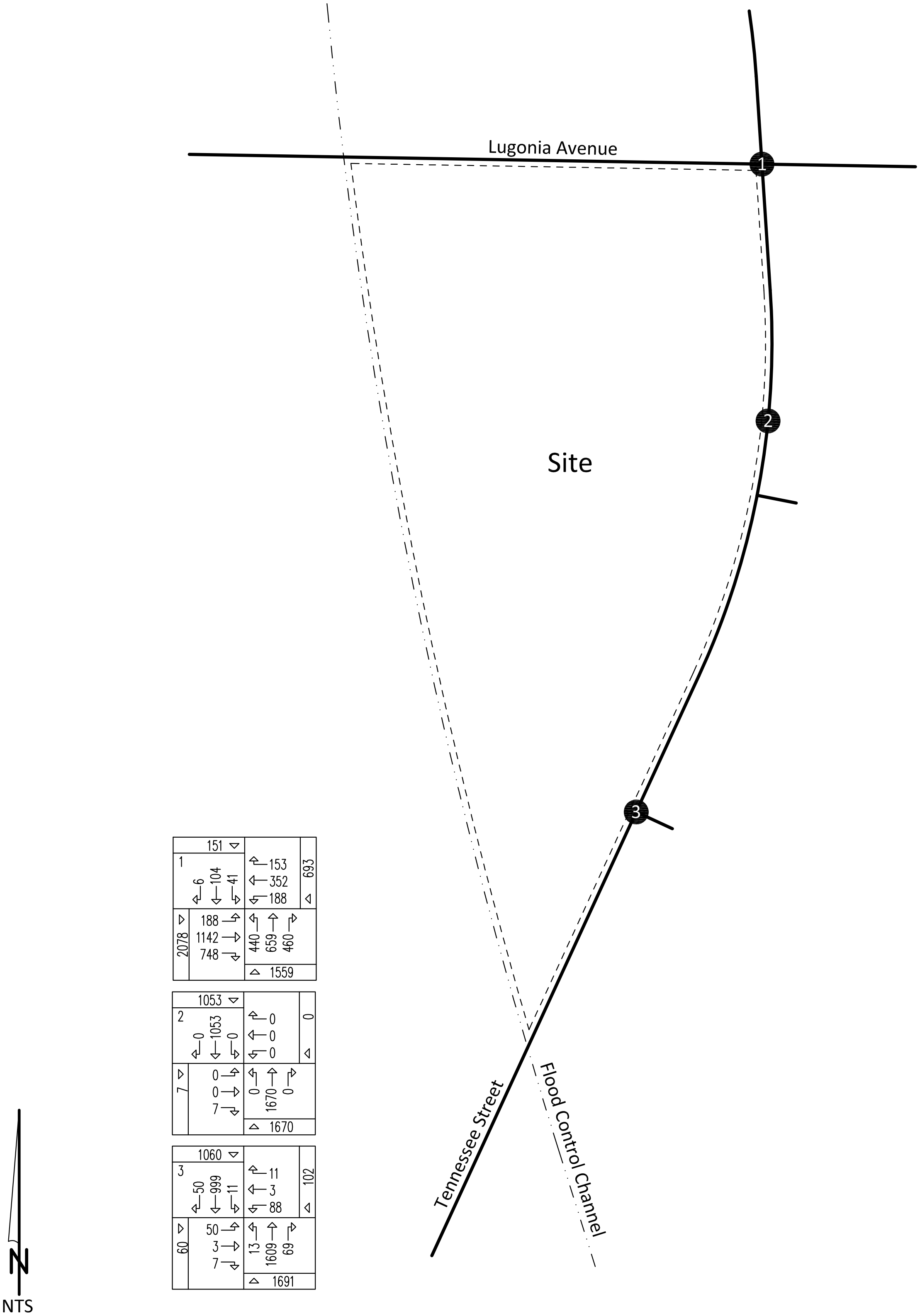
Figure 28
Year 2035 With Project
Morning Peak Hour Intersection Turning Movement Volumes



5604/28

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 29
Year 2035 With Project
Evening Peak Hour Intersection Turning Movement Volumes



5604/29

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Over 35 Years of Excellent Service

V. Project Mitigation

A. Required Improvements and Costs

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Existing Plus Project, Opening Year (2015), and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The approximate costs for the Year 2035 improvements have generally been estimated using cost guidelines in the Congestion Management Program Handbook (see Appendix F). A unit cost of $400,000 for installation of a traffic signal has been substituted for the somewhat lower value cited in the Congestion Management Program materials. For adding a through lane, a unit cost of $289,720 has been assumed. The needed improvements and resulting costs are summarized in Table 8 for the study area intersections.

The total cost of needed and unfunded intersection improvements is $320,000.

B. Project Contribution and Fair Share Costs

The project fair share contributions have also been calculated for Year 2035 improvement locations. The project share of cost has been based on the proportion of project peak hour traffic contributed to the improvement location relative to the total new peak hour Year 2035 traffic volume.

Table 8 presents a summary of improvement cost and project cost shares at the Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the evening peak hour traffic volumes. As shown in Table 8, the project's fair share of identified intersection costs is $13,529.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this traffic impact analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

As mitigation for the potential traffic impacts, the proposed project shall contribute through an adopted traffic impact fee program in addition to any fair share contributions shown within the traffic study which is not covered within this fee program.

Table 8

Project Fair Share Intersection Traffic Contribution

Intersection	Improvement	Cost[1]	Type of Improvement	Peak Hour	Existing Traffic	Year 2035 With Project Traffic	Project Traffic	Total New Traffic	Project % of New Traffic	Project Cost Share
Tennessee Street (NS) at:										
Lugonia Avenue (EW) - #1	Install a Northbound Right Turn Overlap	$50,000	Fair Share	Morning	1,222	2,332	42	1,110	3.8%	$1,892
				Evening	2,539	4,481	100	1,942	5.1%	$2,575
Project South Access (EW) - #3	Install a Northbound Left Turn Lane	$10,000	Project	Morning	848	1,648	58	800	7.3%	$10,000
				Evening	1,519	2,913	133	1,394	9.5%	$10,000
	Install a Southbound Left Turn Lane	$10,000	Fair Share	Morning	848	1,648	58	800	7.3%	$725
				Evening	1,519	2,913	133	1,394	9.5%	$954
	Install a Traffic Signal[2]	$250,000	Not Recommended	Morning	848	1,648	58	800	0.0%	$0
				Evening	1,519	2,913	133	1,394	0.0%	$0
Total		$320,000								$13,529

[1] See Appendix F.

[2] Per discussions with City of Redlands staff and engineering judgment, a traffic signal is not recommended at this location because of it's close proximity to the existing traffic signal located at Tennessee Street and Lugonia Avenue.

VI. Conclusions and Recommendations

A. Summary

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act.

The City of Redlands is the lead agency responsible for preparation of the traffic impact analysis, in accordance with the California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with full occupancy of the development in Year 2015, at which time it will be generating traffic at its full potential, and for the Year 2035.

A series of scoping discussions were conducted with the City of Redlands to define the desired analysis locations for each future analysis year. In addition, staff from the City of Redlands has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does <u>not</u> contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project does <u>not</u> contribute traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the adjacent County of San Bernardino.

The average daily traffic volume forecasts have been determined using the growth increment approach on the East Valley Traffic Model Year 2000 and Year 2035 average daily traffic volume forecasts (see Appendix C). This difference defines the growth in traffic over the 35 year period. The incremental growth in average daily traffic volume has been factored to reflect the forecast growth between Year 2014 and Year 2035. For this purpose, linear growth between the Year 2000 base condition and the forecast Year 2035 condition was assumed. Since the increment between Year 2014 and Year 2035 is 21 years of the 35 year time frame, a factor of 0.6 (i.e., 21/35) was used.

The Year 2035 without project daily and peak hour directional roadway segment volume forecasts have been determined using the growth increment approach on the East Valley Traffic Model Year 2000 and Year 2035 peak hour volumes. The growth increment calculation worksheets are shown in Appendix C. Current peak hour intersection approach/departure data is a necessary input to this approach. The existing traffic count data serves as both the starting point for the refinement process, and also provides important insight into current travel patterns and the relationship between peak hour and daily traffic conditions. The initial turning movement proportions are estimated based upon the relationship of each approach leg's forecast traffic volume to the other legs forecast volumes at the intersection. The initial estimate of turning movement proportions is then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program Report 255. A linear programming algorithm is used to calculate individual turning movements that match the known directional roadway segment volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The Opening Year (2015) traffic volumes have been interpolated from the Year 2035 traffic volumes based upon a portion of the future growth increment.

Project traffic volumes were then added to the East Valley Traffic Model traffic volumes. Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect a minimum of 10% growth over existing traffic volumes. The result of this traffic forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

B. Existing Conditions

Regional access to the project site is provided by the I-10 Freeway and SR-210 Freeway. Local access is provided by various roadways in the vicinity of the site. The east-west roadway which will be most affected by the project is Lugonia Avenue. The north-south roadway which will be most affected by the project is Tennessee Street.

For Existing traffic conditions, the study area intersections are currently operating within acceptable Levels of Service, except for the following study area intersection that currently operates at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    Project South Access - #3

A traffic signal appears to currently be warranted at the following study area intersection for existing traffic conditions (see Appendix E):

Tennessee Street (NS) at:
    Project South Access (EW) - #3

The unsignalized intersection has been evaluated for a traffic signal using the California Department of Transportation Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the California Manual of Uniform Traffic Control Devices.

Per discussions with the City of Redlands staff and engineering judgment, a traffic signal is not recommended at this location because of its close proximity to the existing traffic signal located at Tennessee Street and Lugonia Avenue.

C. Project Traffic

Trip generation rates were determined for daily traffic and morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the trip generation rates by the land use quantity, the traffic volumes are determined. Project trip generation is based upon a manual vehicular count of the existing Matt's Express Car Wash facility located in the City of Rialto on January 16, 2014.

The proposed development is projected to generate approximately 944 daily vehicle trips, 58 of which will occur during the morning peak hour and 134 of which will occur during the evening peak hour.

To determine the trip distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

D. Future Conditions

An Existing Plus Project, Opening Year (2015) analysis, and Year 2035 analysis are included in this report. The Existing Plus Project traffic operations analysis is summarized in Table 3. Opening Year (2015) traffic operations analysis has been completed for the morning and evening peak hours and are shown in Tables 4 and 5. Morning and evening peak hour traffic operations analysis are summarized in Tables 6 and 7 for the Year 2035.

1. Existing Plus Project

For Existing Plus Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    Project South Access - #3

For Existing Plus Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

2. Opening Year (2015) Without Project

For Opening Year (2015) Without Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hour:

Tennessee Street (NS) at:
    South Project Access - #3

For Opening Year (2015) Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

3. Opening Year (2015) With Project

For Opening Year (2015) With Project traffic conditions, the following study area intersection is projected to operate at an unacceptable Level of Service during the evening peak hours:

Tennessee Street (NS) at:
    South Project Access - #3

For Opening Year (2015) With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

4. Year 2035 Without Project

For Year 2035 Without Project traffic conditions, the following study area intersections are projected to operate at unacceptable Levels of Service during the peak hours:

Tennessee Street (NS) at:
    Lugonia Avenue - #1
    Project South Access - #3

For Year 2035 Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

5. Year 2035 With Project

For Year 2035 With Project traffic conditions, the following study area intersections are projected to operate at unacceptable Levels of Service during the peak hours:

Tennessee Street (NS) at:
    Lugonia Avenue - #1
    Project South Access - #3

For Year 2035 With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours, with improvements.

E. Cost Summary

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Existing Plus Project, Opening Year

(2013), and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The total cost of needed and unfunded intersection improvements is $320,000.

Table 8 presents a summary of improvement cost and project cost shares at the Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the evening peak hour traffic volumes. As shown in Table 8, the project's fair share of identified intersection costs is $13,529.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this traffic impact analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

As mitigation for the potential traffic impacts, the proposed project shall contribute through an adopted traffic impact fee program in addition to any fair share contributions shown within the traffic study which is not covered within this fee program.

F. Recommendations

The recommendations in this section address on-site improvements, off-site improvements and the phasing of all necessary study area transportation improvements.

1. On-Site Improvements

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself (see Figure 30).

Construct Lugonia Avenue from the west project boundary to Tennessee Street at its ultimate half-section width as a Major Arterial (110 foot right-of-way) including landscaping and parkway improvements in conjunction with development, as necessary.

Construct Tennessee Street from the south project boundary to Lugonia Avenue at its ultimate half-section width as a Collector (64 foot right-of-way) including landscaping and parkway improvements in conjunction with development, as necessary.

"KEEP CLEAR" should be painted at the intersection of Tennessee Street and Project South Access to prevent vehicles from blocking the roadway preventing vehicles desiring to enter and exit the project site.

Sight distance at project accesses shall comply with standard California Department of Transportation and City of Redlands sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

The site should provide sufficient parking spaces to meet City of Redlands parking code requirements in order to service on-site parking demand.

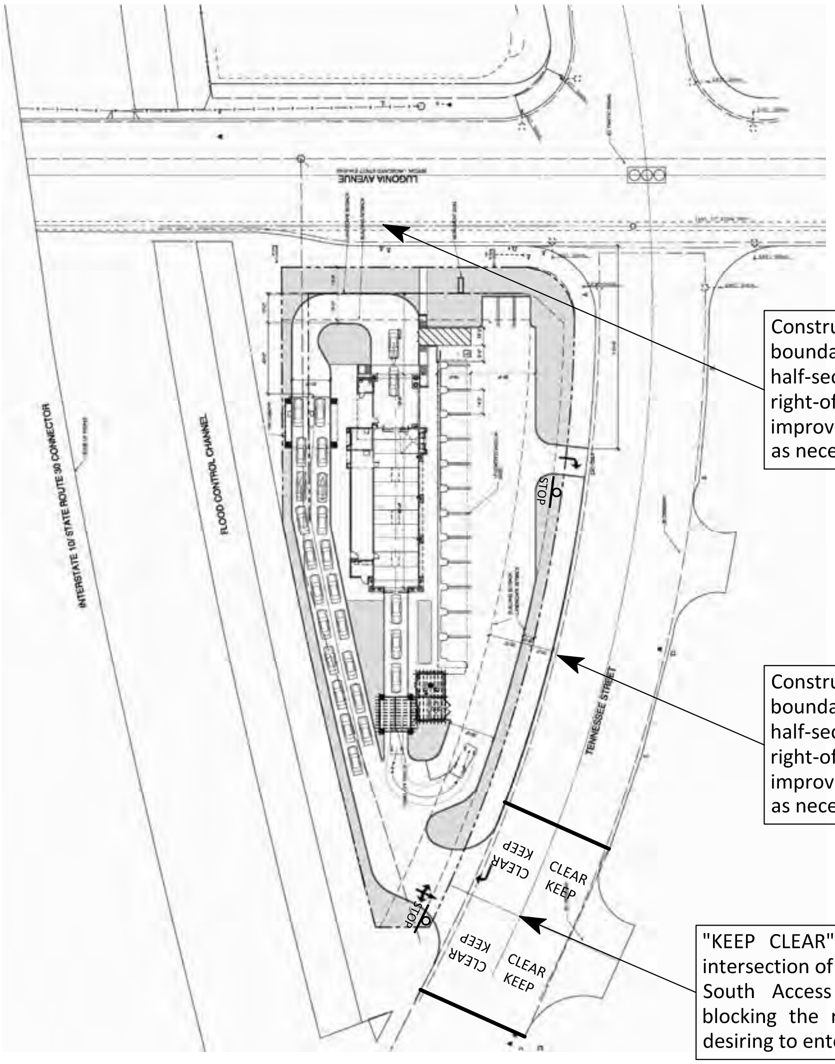
2. Off-Site Improvements

The necessary off-site improvement recommendations were described in previous sections of this report. The project should contribute towards the cost of necessary study area improvements on a fair share or “pro-rata” basis.

As is the case for any roadway design, the City of Redlands should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Participate in the phased construction of off-site traffic signals through payment of traffic signal mitigation fees. The traffic signals within the study area at buildout should specifically include an interconnect of the traffic signals to function in a coordinated system.

Figure 30
Circulation Recommendations



Construct Lugonia Avenue from the west project boundary to Tennessee Street at its ultimate half-section width as a Major Arterial (110 foot right-of-way) including landscaping and parkway improvements in conjunction with development, as necessary.

Construct Tennessee Street from the south project boundary to Lugonia Avenue at its ultimate half-section width as a Collector (64 foot right-of-way) including landscaping and parkway improvements in conjunction with development, as necessary.

"KEEP CLEAR" should be painted at the intersection of Tennessee Street and Project South Access to prevent vehicles from blocking the roadway preventing vehicles desiring to enter and exit the project site.

Sight distance at project accesses shall comply with standard California Department of Transportation and City of Redlands sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

The site should provide sufficient parking spaces to meet City of Redlands parking code requirements in order to service on-site parking demand.

The project should contribute towards the cost of necessary study area improvements on a fair share or "pro-rata" basis.

As is the case for any roadway design, the City of Redlands should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Participate in the phased construction of off-site traffic signals through payment of traffic signal mitigation fees. The traffic signals within the study area at buildout should specifically include an interconnect of the traffic signals to function in a coordinated system.

Legend

STOP = Stop Sign

N

NTS

5604/30

INTERNAL TRIP CALCULATIONS

Analyst: DKS

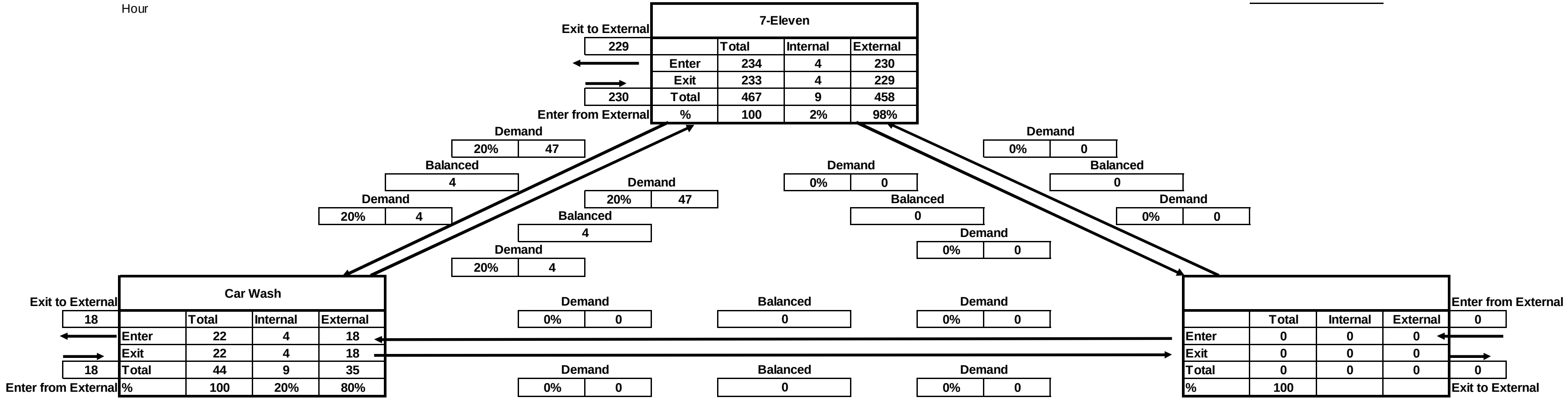
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
RETAIL USES

Name of Development: River Oaks Marketplace

Percentages from Second Edition, P.M. Peak Hour

Time Period: AM Peak Hour



7-Eleven

	Total	Internal	External
Enter	234	4	230
Exit	233	4	229
Total	467	9	458
%	100	2%	98%

Car Wash

	Total	Internal	External
Enter	22	4	18
Exit	22	4	18
Total	44	9	35
%	100	20%	80%

	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	100		

Net External Trips for Multi-use Development

	Car Wash	*7-Eleven*		*TOTAL*
Enter	18	230	0	247
Exit	18	229	0	246
Total	35	458	0	493
Single-Use Trip Generation Est.	44	467	0	511

INTERNAL CAPTURE

3%

Analyst: DKS

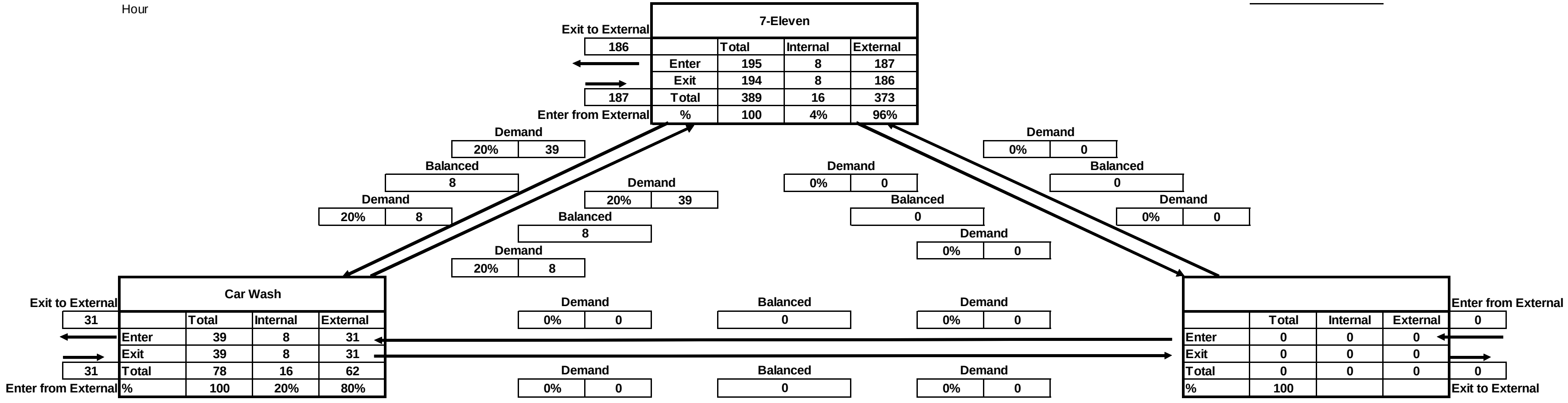
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
RETAIL USES

Name of Development: River Oaks Marketplace

Percentages from Second Edition, P.M. Peak Hour

Time Period: PM Peak Hour



7-Eleven

	Total	Internal	External
Enter	195	8	187
Exit	194	8	186
Total	389	16	373
%	100	4%	96%

Car Wash

	Total	Internal	External
Enter	39	8	31
Exit	39	8	31
Total	78	16	62
%	100	20%	80%

	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	100		

Net External Trips for Multi-use Development

	Car Wash	*7-Eleven*		*TOTAL*
Enter	31	187	0	218
Exit	31	186	0	217
Total	62	373	0	436
Single-Use Trip Generation Est.	78	389	0	467

INTERNAL CAPTURE
7%

Analyst: DKS

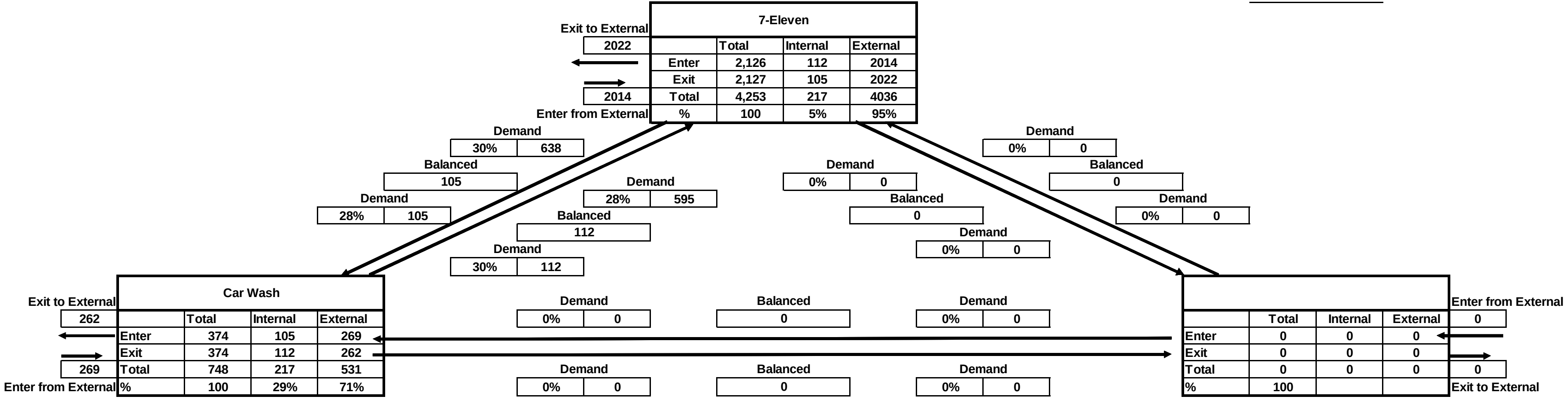
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
RETAIL USES

Name of Development: River Oaks Marketplace

Percentages from Second Edition, Daily

Time Period: Daily



7-Eleven

Exit to External: 2022

Enter from External: 2014

	Total	Internal	External
Enter	2,126	112	2014
Exit	2,127	105	2022
Total	4,253	217	4036
%	100	5%	95%

Demand: 30% 638

Balanced: 105

Demand: 28% 105

Demand: 28% 595

Balanced: 112

Demand: 30% 112

Demand: 0% 0

Balanced: 0

Demand: 0% 0

Demand: 0% 0

Balanced: 0

Demand: 0% 0

Car Wash

Exit to External: 262

Enter from External: 269

	Total	Internal	External
Enter	374	105	269
Exit	374	112	262
Total	748	217	531
%	100	29%	71%

Demand: 0% 0

Balanced: 0

Demand: 0% 0

Demand: 0% 0

Balanced: 0

Demand: 0% 0

Enter from External: 0

Exit to External: 0

	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	100		

Net External Trips for Multi-use Development

	Car Wash	*7-Eleven*		*TOTAL*
Enter	269	2,014	0	2,283
Exit	262	2,022	0	2,284
Total	531	4,036	0	4,567
Single-Use Trip Generation Est.	748	4,253	0	5,001

INTERNAL CAPTURE

9%

Analyst: DKS

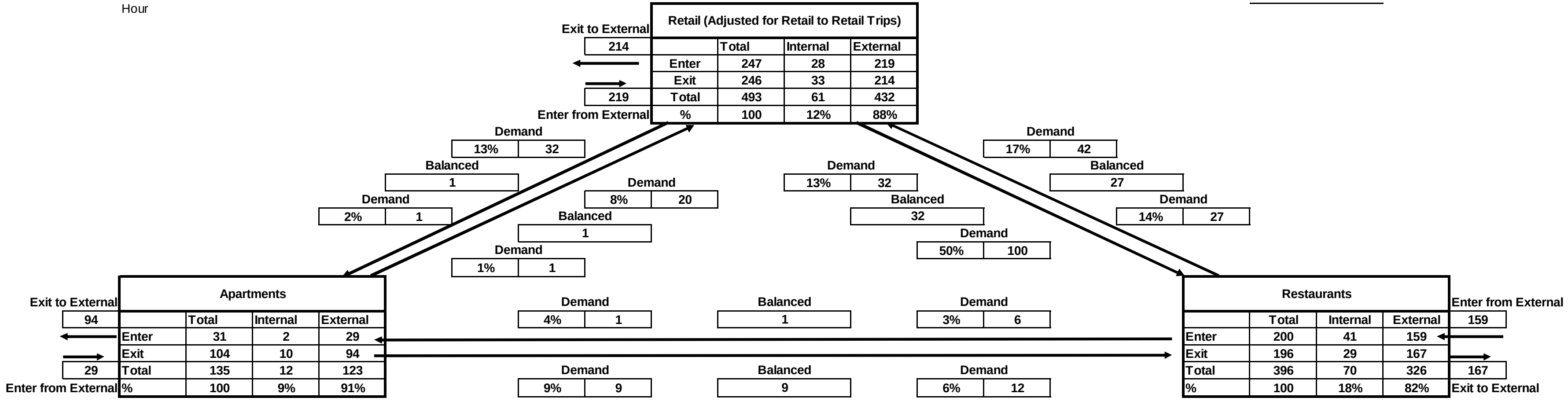
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
Mixed-Use

Name of Development: River Oaks Marketplace

Percentages from Third Edition, A.M. Peak Hour

Time Period: AM Peak Hour



Retail (Adjusted for Retail to Retail Trips)

	Total	Internal	External
Enter	247	28	219
Exit	246	33	214
Total	493	61	432
%	100	12%	88%

Apartments

	Total	Internal	External
Enter	31	2	29
Exit	104	10	94
Total	135	12	123
%	100	9%	91%

Restaurants

	Total	Internal	External
Enter	200	41	159
Exit	196	29	167
Total	396	70	326
%	100	18%	82%

Net External Trips for Multi-use Development

	Apartments	*Retail (Adjusted for Retail to Retail Trips)*	*Restaurants*	*TOTAL*
Enter	29	219	159	406
Exit	94	214	167	474
Total	123	432	326	881
Single-Use Trip Generation Est.	135	493	396	1024

INTERNAL CAPTURE

14%

Analyst: DKS

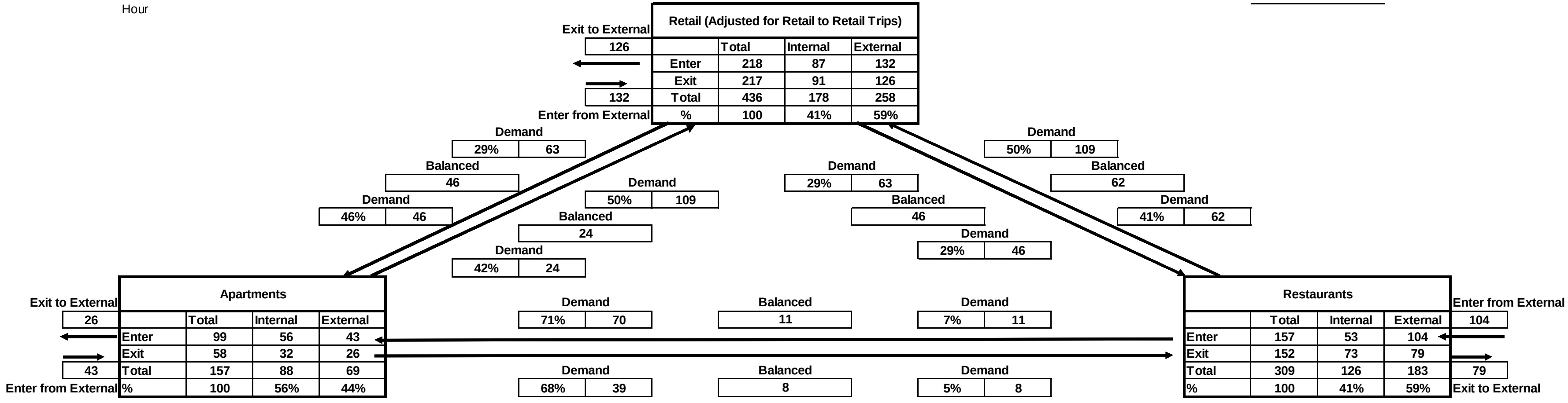
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
Mixed-Use

Name of Development: **River Oaks Marketplace**

Percentages from Third Edition, P.M. Peak Hour

Time Period: **PM Peak Hour**



Retail (Adjusted for Retail to Retail Trips)

	Total	Internal	External
Enter	218	87	132
Exit	217	91	126
Total	436	178	258
%	100	41%	59%

Apartments

	Total	Internal	External
Enter	99	56	43
Exit	58	32	26
Total	157	88	69
%	100	56%	44%

Restaurants

	Total	Internal	External
Enter	157	53	104
Exit	152	73	79
Total	309	126	183
%	100	41%	59%

Net External Trips for Multi-use Development

	Apartments	*Retail (Adjusted for Retail to Retail Trips)*	*Restaurants*	*TOTAL*	
Enter	43	132	104	278	
Exit	26	126	79	231	
Total	69	258	183	509	*INTERNAL CAPTURE*
Single-Use Trip Generation Est.	157	436	309	902	44%

Analyst: DKS

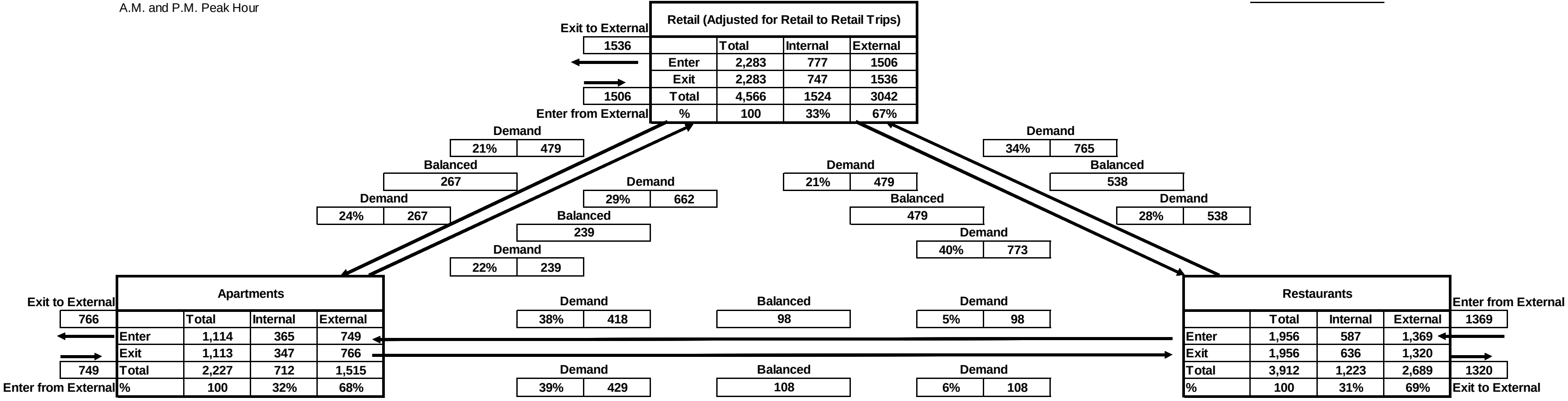
Date: 7/24/2020

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY
Mixed-Use

Name of Development: River Oaks Marketplace

Percentages from Third Edition, Average of
A.M. and P.M. Peak Hour

Time Period: Daily



Retail (Adjusted for Retail to Retail Trips)

	Total	Internal	External
Enter	2,283	777	1506
Exit	2,283	747	1536
Total	4,566	1524	3042
%	100	33%	67%

Apartments

	Total	Internal	External
Enter	1,114	365	749
Exit	1,113	347	766
Total	2,227	712	1,515
%	100	32%	68%

Restaurants

	Total	Internal	External
Enter	1,956	587	1,369
Exit	1,956	636	1,320
Total	3,912	1,223	2,689
%	100	31%	69%

Net External Trips for Multi-use Development

	Apartments	*Retail (Adjusted for Retail to Retail Trips)*	*Restaurants*	*TOTAL*
Enter	749	1,506	1,369	3,624
Exit	766	1,536	1,320	3,623
Total	1,515	3,042	2,689	7,246
Single-Use Trip Generation Est.	2,227	4,566	3,912	10,705

INTERNAL CAPTURE
32%

INTERSECTION ANALYSIS

EXISTING CONDITIONS

AM PEAK HOUR

1: West El Camino Avenue & Westbound I-80 Ramp

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	449	274	0	710	96
Future Volume (veh/h)	0	449	274	0	710	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	449	274	0	710	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	811	811	0	769	
Arrive On Green	0.00	0.43	0.43	0.00	0.43	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	449	274	0	710	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	9.8	5.3	0.0	20.7	0.0
Cycle Q Clear(g_c), s	0.0	9.8	5.3	0.0	20.7	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	811	811	0	769	
V/C Ratio(X)	0.00	0.55	0.34	0.00	0.92	
Avail Cap(c_a), veh/h	0	811	811	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.6	10.3	0.0	14.8	0.0
Incr Delay (d2), s/veh	0.0	2.7	1.1	0.0	14.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	1.9	0.0	9.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.3	11.5	0.0	29.3	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h		449	274		710	A
Approach Delay, s/veh		14.3	11.5		29.3	
Approach LOS		B	B		C	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		27.8				27.8		27.2
Change Period (Y+Rc), s		3.9				3.9		3.5
Max Green Setting (Gmax), s		21.1				21.1		26.5
Max Q Clear Time (g_c+I1), s		11.8				7.3		22.7
Green Ext Time (p_c), s		1.1				0.7		1.0

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue

08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	1040	0	0	545	117	372
Future Volume (veh/h)	1040	0	0	545	117	372
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1040	0	0	545	117	372
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	1374	0	0	1374	348	310
Arrive On Green	0.73	0.00	0.00	0.73	0.20	0.20
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	1040	0	0	545	117	372
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	36.6	0.0	0.0	12.0	6.2	21.5
Cycle Q Clear(g_c), s	36.6	0.0	0.0	12.0	6.2	21.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1374	0	0	1374	348	310
V/C Ratio(X)	0.76	0.00	0.00	0.40	0.34	1.20
Avail Cap(c_a), veh/h	1374	0	0	1379	348	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.7	0.0	0.0	5.5	38.1	44.3
Incr Delay (d2), s/veh	3.9	0.0	0.0	0.9	0.2	117.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	0.0	0.0	3.9	2.6	18.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.7	0.0	0.0	6.3	38.3	161.4
LnGrp LOS	B	A	A	A	D	F
Approach Vol, veh/h	1040			545	489	
Approach Delay, s/veh	12.7			6.3	131.9	
Approach LOS	B			A	F	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	85.0	85.0	25.0
Change Period (Y+Rc), s	* 4.2	* 4.2	3.5
Max Green Setting (Gmax), s	* 81	* 81	21.5
Max Q Clear Time (g_c+I1), s	38.6	14.0	23.5
Green Ext Time (p_c), s	5.7	2.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	32	1308	71	55	693	9	448	7	120	14	2	6
Future Volume (veh/h)	32	1308	71	55	693	9	448	7	120	14	2	6
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	1308	71	55	693	9	448	7	120	14	2	6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	1429	637	99	903	403	446	9	154	477	464	393
Arrive On Green	0.20	0.40	0.40	0.06	0.25	0.25	0.13	0.10	0.10	0.27	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	88	1510	1781	1870	1585
Grp Volume(v), veh/h	32	1308	71	55	693	9	448	0	127	14	2	6
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1598	1781	1870	1585
Q Serve(g_s), s	1.8	41.8	3.4	3.6	21.7	0.5	15.5	0.0	9.3	0.7	0.1	0.2
Cycle Q Clear(g_c), s	1.8	41.8	3.4	3.6	21.7	0.5	15.5	0.0	9.3	0.7	0.1	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	350	1429	637	99	903	403	446	0	163	477	464	393
V/C Ratio(X)	0.09	0.92	0.11	0.55	0.77	0.02	1.00	0.00	0.78	0.03	0.00	0.02
Avail Cap(c_a), veh/h	350	1593	711	111	1567	699	446	0	394	477	464	393
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	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	34.0	22.5	55.2	41.5	33.6	52.3	0.0	52.6	32.4	34.0	13.1
Incr Delay (d2), s/veh	0.0	7.6	0.0	6.2	1.9	0.0	43.5	0.0	30.3	0.0	0.0	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	0.8	18.5	1.2	1.8	9.4	0.2	9.4	0.0	5.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	41.6	22.5	61.4	43.3	33.6	95.8	0.0	82.9	32.4	34.0	13.1
LnGrp LOS	D	D	C	E	D	C	F	A	F	C	C	B
Approach Vol, veh/h		1411			757			575			22	
Approach Delay, s/veh		40.6			44.5			92.9			27.3	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.6	17.6	11.2	53.6	20.0	35.2	29.0	35.9
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	9.3	* 30	7.5	53.8	15.5	23.4	8.4	* 53
Max Q Clear Time (g_c+I1), s	2.7	11.3	5.6	43.8	17.5	2.2	3.8	23.7
Green Ext Time (p_c), s	0.0	0.9	0.0	4.4	0.0	0.0	0.0	6.8

Intersection Summary	
HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	0	1274	34	196	749	38	0	0	47	0	0	8
Future Volume (veh/h)	0	1274	34	196	749	38	0	0	47	0	0	8
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	1274	34	196	749	38	0	0	47	0	0	8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	1348	36	223	1933	862	1	0	580	1	0	580
Arrive On Green	0.00	0.38	0.38	0.13	0.54	0.54	0.00	0.00	0.37	0.00	0.00	0.37
Sat Flow, veh/h	1781	3536	94	1781	3554	1585	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	0	640	668	196	749	38	0	0	47	0	0	8
Grp Sat Flow(s),veh/h/ln	1781	1777	1853	1781	1777	1585	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.0	41.8	41.9	13.0	14.6	1.3	0.0	0.0	2.3	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.0	41.8	41.9	13.0	14.6	1.3	0.0	0.0	2.3	0.0	0.0	0.4
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1	677	707	223	1933	862	1	0	580	1	0	580
V/C Ratio(X)	0.00	0.94	0.95	0.88	0.39	0.04	0.00	0.00	0.08	0.00	0.00	0.01
Avail Cap(c_a), veh/h	191	690	720	245	1933	862	181	0	580	200	0	580
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)	0.00	0.29	0.29	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.9	35.9	51.6	15.8	12.8	0.0	0.0	24.9	0.0	0.0	24.2
Incr Delay (d2), s/veh	0.0	8.6	8.5	26.8	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0
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	0.0	18.7	19.5	7.3	5.6	0.5	0.0	0.0	0.9	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	44.5	44.4	78.4	15.9	12.8	0.0	0.0	25.1	0.0	0.0	24.3
LnGrp LOS	A	D	D	E	B	B	A	A	C	A	A	C
Approach Vol, veh/h		1308			983			47			8	
Approach Delay, s/veh		44.5			28.3			25.1			24.3	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	49.3	19.5	51.1	0.0	49.3	0.0	70.7
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4
Max Green Setting (Gmax), s	13.5	23.6	16.5	46.6	12.2	24.9	12.9	50.2
Max Q Clear Time (g_c+I1), s	0.0	4.3	15.0	43.9	0.0	2.4	0.0	16.6
Green Ext Time (p_c), s	0.0	0.2	0.1	1.9	0.0	0.0	0.0	5.4

Intersection Summary	
HCM 6th Ctrl Delay	37.2
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱				↱			↱
Traffic Vol, veh/h	0	1476	4	0	852	0	0	0	17	0	0	0
Future Vol, veh/h	0	1476	4	0	852	0	0	0	17	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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1476	4	0	852	0	0	0	17	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	740	-	-	426
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	359	0	0	577
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	359	-	-	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.5	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	359	-	-	-	-	-
HCM Lane V/C Ratio	0.047	-	-	-	-	-
HCM Control Delay (s)	15.5	-	-	-	-	0
HCM Lane LOS	C	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

HCM 6th Signalized Intersection Summary
6: Gateway Oaks Drive & West El Camino Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	313	624	431	351	525	574	209	117	127	130	34	32
Future Volume (veh/h)	313	624	431	351	525	574	209	117	127	130	34	32
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	313	624	431	351	525	574	209	117	127	130	34	32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	1898	589	440	1280	571	475	583	260	426	528	236
Arrive On Green	0.14	0.37	0.37	0.13	0.36	0.36	0.14	0.16	0.16	0.12	0.15	0.15
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	313	624	431	351	525	574	209	117	127	130	34	32
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.1	8.2	22.1	9.3	10.4	33.9	5.2	2.7	6.9	3.2	0.8	1.7
Cycle Q Clear(g_c), s	8.1	8.2	22.1	9.3	10.4	33.9	5.2	2.7	6.9	3.2	0.8	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	1898	589	440	1280	571	475	583	260	426	528	236
V/C Ratio(X)	0.66	0.33	0.73	0.80	0.41	1.01	0.44	0.20	0.49	0.31	0.06	0.14
Avail Cap(c_a), veh/h	477	1898	589	551	1280	571	477	1178	525	440	1136	507
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	21.2	25.5	39.9	22.6	30.1	37.3	34.0	35.8	37.6	34.4	34.8
Incr Delay (d2), s/veh	2.6	0.0	4.1	5.1	0.1	39.1	0.2	0.1	0.5	0.1	0.0	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	3.4	3.1	8.7	4.1	4.1	18.5	2.2	1.2	2.7	1.4	0.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	21.2	29.6	44.9	22.7	69.2	37.5	34.1	36.3	37.7	34.5	34.9
LnGrp LOS	D	C	C	D	C	F	D	C	D	D	C	C
Approach Vol, veh/h		1368			1450			453			196	
Approach Delay, s/veh		28.4			46.5			36.3			36.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	38.7	18.0	19.3	17.0	39.8	16.6	20.7
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 34	* 13	* 30	15.0	* 32	12.0	* 31
Max Q Clear Time (g_c+I1), s	10.1	35.9	7.2	3.7	11.3	24.1	5.2	8.9
Green Ext Time (p_c), s	0.2	0.0	0.2	0.1	0.3	2.3	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	37.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

INTERSECTION ANALYSIS

EXISTING CONDITIONS

PM PEAK HOUR

1: West El Camino Avenue & Westbound I-80 Ramp

08/03/2020

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	232	905	0	321	152
Future Volume (veh/h)	0	232	905	0	321	152
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	232	905	0	321	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1206	1206	0	393	
Arrive On Green	0.00	0.64	0.64	0.00	0.22	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	232	905	0	321	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	2.8	18.3	0.0	9.4	0.0
Cycle Q Clear(g_c), s	0.0	2.8	18.3	0.0	9.4	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1206	1206	0	393	
V/C Ratio(X)	0.00	0.19	0.75	0.00	0.82	
Avail Cap(c_a), veh/h	0	1206	1206	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	4.0	6.7	0.0	20.4	0.0
Incr Delay (d2), s/veh	0.0	0.4	4.3	0.0	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.6	4.8	0.0	3.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	4.3	11.0	0.0	24.6	0.0
LnGrp LOS	A	A	B	A	C	
Approach Vol, veh/h		232	905		321	A
Approach Delay, s/veh		4.3	11.0		24.6	
Approach LOS		A	B		C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	39.4	39.4	15.6
Change Period (Y+Rc), s	3.9	3.9	3.5
Max Green Setting (Gmax), s	21.1	21.1	26.5
Max Q Clear Time (g_c+I1), s	4.8	20.3	11.4
Green Ext Time (p_c), s	0.6	0.4	0.8

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue

08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	480	0	0	675	646	688
Future Volume (veh/h)	480	0	0	675	646	688
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	480	0	0	675	646	688
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	898	0	0	898	801	713
Arrive On Green	0.48	0.00	0.00	0.48	0.45	0.45
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	480	0	0	675	646	688
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	19.7	0.0	0.0	32.3	34.4	46.4
Cycle Q Clear(g_c), s	19.7	0.0	0.0	32.3	34.4	46.4
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	898	0	0	898	801	713
V/C Ratio(X)	0.53	0.00	0.00	0.75	0.81	0.96
Avail Cap(c_a), veh/h	898	0	0	898	834	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	0.0	23.3	26.1	29.4
Incr Delay (d2), s/veh	2.3	0.0	0.0	5.8	5.2	23.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	0.0	0.0	14.5	14.6	20.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.3	0.0	0.0	29.0	31.3	53.3
LnGrp LOS	C	A	A	C	C	D
Approach Vol, veh/h	480			675	1334	
Approach Delay, s/veh	22.3			29.0	42.7	
Approach LOS	C			C	D	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	57.0	57.0	53.0
Change Period (Y+Rc), s	* 4.2	* 4.2	3.5
Max Green Setting (Gmax), s	* 51	* 51	51.5
Max Q Clear Time (g_c+I1), s	21.7	34.3	48.4
Green Ext Time (p_c), s	1.7	2.4	1.1

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	2	881	285	113	1009	0	226	1	98	12	1	4
Future Volume (veh/h)	2	881	285	113	1009	0	226	1	98	12	1	4
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	881	285	113	1009	0	226	1	98	12	1	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	1263	563	141	1269	566	268	2	160	519	604	512
Arrive On Green	0.07	0.36	0.36	0.08	0.36	0.00	0.08	0.10	0.10	0.29	0.32	0.32
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	16	1571	1781	1870	1585
Grp Volume(v), veh/h	2	881	285	113	1009	0	226	0	99	12	1	4
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1587	1781	1870	1585
Q Serve(g_s), s	0.1	25.5	17.0	7.5	30.6	0.0	7.7	0.0	7.2	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.1	25.5	17.0	7.5	30.6	0.0	7.7	0.0	7.2	0.6	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Lane Grp Cap(c), veh/h	125	1263	563	141	1269	566	268	0	161	519	604	512
V/C Ratio(X)	0.02	0.70	0.51	0.80	0.80	0.00	0.84	0.00	0.61	0.02	0.00	0.01
Avail Cap(c_a), veh/h	125	1706	761	143	1741	777	268	0	321	519	604	512
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	1.00	1.00	0.64	0.64	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	33.1	30.4	54.3	34.6	0.0	54.6	0.0	51.6	30.3	27.5	16.1
Incr Delay (d2), s/veh	0.0	0.4	0.3	19.4	1.5	0.0	21.7	0.0	16.2	0.0	0.0	0.0
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	10.5	6.3	4.0	12.9	0.0	4.2	0.0	3.6	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	33.5	30.7	73.8	36.1	0.0	76.4	0.0	67.8	30.3	27.5	16.1
LnGrp LOS	D	C	C	E	D	A	E	A	E	C	C	B
Approach Vol, veh/h		1168			1122			325			17	
Approach Delay, s/veh		32.8			39.9			73.8			26.8	
Approach LOS		C			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.4	17.6	14.0	48.1	13.8	44.2	13.8	48.2
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	8.7	* 24	9.6	57.6	9.3	23.7	8.4	* 59
Max Q Clear Time (g_c+I1), s	2.6	9.2	9.5	27.5	9.7	2.2	2.1	32.6
Green Ext Time (p_c), s	0.0	0.5	0.0	4.4	0.0	0.0	0.0	10.3

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	6	981	27	64	1095	5	0	0	32	5	0	5
Future Volume (veh/h)	6	981	27	64	1095	5	0	0	32	5	0	5
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	981	27	64	1095	5	0	0	32	5	0	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	1143	31	147	1373	613	1	0	653	31	0	739
Arrive On Green	0.02	0.32	0.32	0.08	0.39	0.39	0.00	0.00	0.41	0.02	0.00	0.47
Sat Flow, veh/h	1781	3532	97	1781	3554	1585	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	6	493	515	64	1095	5	0	0	32	5	0	5
Grp Sat Flow(s),veh/h/ln	1781	1777	1853	1781	1777	1585	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.4	31.2	31.2	4.1	32.8	0.2	0.0	0.0	1.5	0.3	0.0	0.2
Cycle Q Clear(g_c), s	0.4	31.2	31.2	4.1	32.8	0.2	0.0	0.0	1.5	0.3	0.0	0.2
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	35	575	600	147	1373	613	1	0	653	31	0	739
V/C Ratio(X)	0.17	0.86	0.86	0.44	0.80	0.01	0.00	0.00	0.05	0.16	0.00	0.01
Avail Cap(c_a), veh/h	191	755	787	171	1469	655	181	0	653	200	0	739
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)	0.73	0.73	0.73	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.9	38.0	38.0	52.4	32.6	22.7	0.0	0.0	21.2	58.1	0.0	17.1
Incr Delay (d2), s/veh	1.7	5.8	5.6	2.0	3.0	0.0	0.0	0.0	0.1	2.4	0.0	0.0
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	13.9	14.4	1.9	14.0	0.1	0.0	0.0	0.6	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	43.8	43.6	54.5	35.6	22.7	0.0	0.0	21.3	60.5	0.0	17.1
LnGrp LOS	E	D	D	D	D	C	A	A	C	E	A	B
Approach Vol, veh/h		1014			1164			32			10	
Approach Delay, s/veh		43.8			36.6			21.3			38.8	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	54.8	14.4	44.2	0.0	61.4	6.8	51.8				
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4				
Max Green Setting (Gmax), s	13.5	24.2	11.5	51.0	12.2	25.5	12.9	49.6				
Max Q Clear Time (g_c+I1), s	2.3	3.5	6.1	33.2	0.0	2.2	2.4	34.8				
Green Ext Time (p_c), s	0.0	0.1	0.0	5.6	0.0	0.0	0.0	6.3				
Intersection Summary												
HCM 6th Ctrl Delay			39.7									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↱			↑↑↱				↱			↱
Traffic Vol, veh/h	0	1009	10	0	1196	0	0	0	14	0	0	0
Future Vol, veh/h	0	1009	10	0	1196	0	0	0	14	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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1009	10	0	1196	0	0	0	14	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	510	-	-	598
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	509	0	0	445
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	509	-	-	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	509	-	-	-	-	-
HCM Lane V/C Ratio	0.028	-	-	-	-	-
HCM Control Delay (s)	12.3	-	-	-	-	0
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	77	724	201	245	404	102	366	60	371	450	117	260
Future Volume (veh/h)	77	724	201	245	404	102	366	60	371	450	117	260
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	724	201	245	404	102	366	60	371	450	117	260
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	452	984	306	502	732	327	546	922	411	547	919	410
Arrive On Green	0.13	0.19	0.19	0.15	0.21	0.21	0.16	0.26	0.26	0.16	0.26	0.26
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	77	724	201	245	404	102	366	60	371	450	117	260
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	1.6	11.0	9.6	5.4	8.4	4.5	8.2	1.0	18.6	10.4	2.1	12.0
Cycle Q Clear(g_c), s	1.6	11.0	9.6	5.4	8.4	4.5	8.2	1.0	18.6	10.4	2.1	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	452	984	306	502	732	327	546	922	411	547	919	410
V/C Ratio(X)	0.17	0.74	0.66	0.49	0.55	0.31	0.67	0.07	0.90	0.82	0.13	0.63
Avail Cap(c_a), veh/h	546	1626	505	504	1097	489	760	1326	591	882	1447	645
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	31.2	30.7	32.4	29.3	27.7	32.6	23.0	29.5	33.5	23.4	27.1
Incr Delay (d2), s/veh	0.1	0.4	0.9	0.3	0.2	0.2	0.5	0.0	10.3	1.5	0.0	0.6
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	0.6	4.2	3.7	2.1	3.4	1.7	3.4	0.4	8.0	4.3	0.9	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.9	31.7	31.6	32.6	29.5	27.9	33.2	23.0	39.8	35.0	23.4	27.7
LnGrp LOS	C	C	C	C	C	C	C	C	D	D	C	C
Approach Vol, veh/h		1002			751			797			827	
Approach Delay, s/veh		31.7			30.3			35.5			31.1	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	21.8	18.1	26.6	17.0	20.7	18.0	26.7
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 25	* 18	* 34	12.0	* 26	21.0	* 31
Max Q Clear Time (g_c+I1), s	3.6	10.4	10.2	14.0	7.4	13.0	12.4	20.6
Green Ext Time (p_c), s	0.1	1.5	0.5	0.9	0.2	2.9	0.7	0.7

Intersection Summary	
HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

INTERSECTION ANALYSIS

BASELINE CONDITIONS

AM PEAK HOUR

HCM 6th Signalized Intersection Summary
1: West El Camino Avenue & Westbound I-80 Ramp

08/03/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	453	299	0	725	96
Future Volume (veh/h)	0	453	299	0	725	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	453	299	0	725	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	798	798	0	782	
Arrive On Green	0.00	0.43	0.43	0.00	0.44	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	453	299	0	725	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	10.1	6.0	0.0	21.2	0.0
Cycle Q Clear(g_c), s	0.0	10.1	6.0	0.0	21.2	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	798	798	0	782	
V/C Ratio(X)	0.00	0.57	0.37	0.00	0.93	
Avail Cap(c_a), veh/h	0	798	798	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.9	10.8	0.0	14.6	0.0
Incr Delay (d2), s/veh	0.0	2.9	1.3	0.0	15.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	2.2	0.0	9.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.8	12.1	0.0	29.8	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h		453	299		725	A
Approach Delay, s/veh		14.8	12.1		29.8	
Approach LOS		B	B		C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	27.4	27.4	27.6
Change Period (Y+Rc), s	3.9	3.9	3.5
Max Green Setting (Gmax), s	21.1	21.1	26.5
Max Q Clear Time (g_c+I1), s	12.1	8.0	23.2
Green Ext Time (p_c), s	1.1	0.8	1.0

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue

08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	1059	0	0	635	117	393
Future Volume (veh/h)	1059	0	0	635	117	393
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1059	0	0	635	117	393
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	1374	0	0	1374	348	310
Arrive On Green	0.73	0.00	0.00	0.73	0.20	0.20
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	1059	0	0	635	117	393
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	38.1	0.0	0.0	15.0	6.2	21.5
Cycle Q Clear(g_c), s	38.1	0.0	0.0	15.0	6.2	21.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1374	0	0	1374	348	310
V/C Ratio(X)	0.77	0.00	0.00	0.46	0.34	1.27
Avail Cap(c_a), veh/h	1374	0	0	1379	348	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	0.0	0.0	5.9	38.1	44.3
Incr Delay (d2), s/veh	4.2	0.0	0.0	1.1	0.2	143.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	0.0	0.0	4.9	2.6	20.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.2	0.0	0.0	7.0	38.3	188.1
LnGrp LOS	B	A	A	A	D	F
Approach Vol, veh/h	1059			635	510	
Approach Delay, s/veh	13.2			7.0	153.8	
Approach LOS	B			A	F	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		85.0				85.0		25.0
Change Period (Y+Rc), s		* 4.2				* 4.2		3.5
Max Green Setting (Gmax), s		* 81				* 81		21.5
Max Q Clear Time (g_c+I1), s		40.1				17.0		23.5
Green Ext Time (p_c), s		5.9				2.5		0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱		↰	↑	↱
Traffic Volume (veh/h)	57	1321	71	57	769	35	435	4	122	49	7	175
Future Volume (veh/h)	57	1321	71	57	769	35	435	4	122	49	7	175
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	1321	71	57	769	35	435	4	122	49	7	175
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	1440	642	99	994	443	446	5	157	472	458	388
Arrive On Green	0.17	0.41	0.41	0.06	0.28	0.28	0.13	0.10	0.10	0.26	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	51	1542	1781	1870	1585
Grp Volume(v), veh/h	57	1321	71	57	769	35	435	0	126	49	7	175
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1593	1781	1870	1585
Q Serve(g_s), s	3.3	42.2	3.3	3.7	23.9	2.0	15.0	0.0	9.3	2.5	0.3	7.3
Cycle Q Clear(g_c), s	3.3	42.2	3.3	3.7	23.9	2.0	15.0	0.0	9.3	2.5	0.3	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	310	1440	642	99	994	443	446	0	162	472	458	388
V/C Ratio(X)	0.18	0.92	0.11	0.57	0.77	0.08	0.97	0.00	0.78	0.10	0.02	0.45
Avail Cap(c_a), veh/h	310	1593	711	111	1567	699	446	0	393	472	458	388
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	1.00	1.00	0.90	0.90	0.90	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.3	33.8	22.2	55.3	39.7	31.8	52.1	0.0	52.6	33.3	34.3	16.3
Incr Delay (d2), s/veh	0.1	7.9	0.0	6.9	1.7	0.1	36.0	0.0	30.0	0.0	0.1	3.7
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	1.4	18.7	1.2	1.8	10.3	0.7	8.7	0.0	5.0	1.1	0.2	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	41.7	22.3	62.1	41.4	31.9	88.0	0.0	82.6	33.4	34.4	20.0
LnGrp LOS	D	D	C	E	D	C	F	A	F	C	C	C
Approach Vol, veh/h		1449			861			561			231	
Approach Delay, s/veh		40.8			42.4			86.8			23.3	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.2	17.6	11.2	54.0	20.0	34.8	26.3	38.9
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	9.3	* 30	7.5	53.8	15.5	23.4	8.4	* 53
Max Q Clear Time (g_c+I1), s	4.5	11.3	5.7	44.2	17.0	9.3	5.3	25.9
Green Ext Time (p_c), s	0.0	0.9	0.0	4.4	0.0	0.3	0.0	7.7

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	15	1308	35	196	801	25	13	0	47	122	3	47
Future Volume (veh/h)	15	1308	35	196	801	25	13	0	47	122	3	47
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	1308	35	196	801	25	13	0	47	122	3	47
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	1363	36	223	1665	743	64	0	339	197	28	434
Arrive On Green	0.04	0.39	0.39	0.13	0.47	0.47	0.04	0.00	0.21	0.11	0.29	0.29
Sat Flow, veh/h	1781	3536	95	1781	3554	1585	1781	0	1585	1781	96	1504
Grp Volume(v), veh/h	15	657	686	196	801	25	13	0	47	122	0	50
Grp Sat Flow(s),veh/h/ln	1781	1777	1853	1781	1777	1585	1781	0	1585	1781	0	1600
Q Serve(g_s), s	1.0	43.2	43.3	13.0	18.6	1.0	0.9	0.0	2.9	7.8	0.0	2.8
Cycle Q Clear(g_c), s	1.0	43.2	43.3	13.0	18.6	1.0	0.9	0.0	2.9	7.8	0.0	2.8
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	75	685	715	223	1665	743	64	0	339	197	0	461
V/C Ratio(X)	0.20	0.96	0.96	0.88	0.48	0.03	0.20	0.00	0.14	0.62	0.00	0.11
Avail Cap(c_a), veh/h	191	690	720	245	1665	743	181	0	339	200	0	461
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)	0.14	0.14	0.14	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.5	35.9	36.0	51.6	21.9	17.2	56.2	0.0	38.2	51.0	0.0	31.4
Incr Delay (d2), s/veh	0.2	6.0	5.9	26.8	0.2	0.0	1.6	0.0	0.9	5.6	0.0	0.5
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	0.4	18.8	19.6	7.3	7.4	0.4	0.4	0.0	1.2	3.8	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	41.9	41.9	78.4	22.1	17.2	57.8	0.0	39.1	56.5	0.0	31.8
LnGrp LOS	E	D	D	E	C	B	E	A	D	E	A	C
Approach Vol, veh/h		1358			1022			60			172	
Approach Delay, s/veh		42.1			32.8			43.1			49.3	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	31.0	19.5	51.7	8.8	40.0	9.6	61.6
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4
Max Green Setting (Gmax), s	13.5	23.6	16.5	46.6	12.2	24.9	12.9	50.2
Max Q Clear Time (g_c+I1), s	9.8	4.9	15.0	45.3	2.9	4.8	3.0	20.6
Green Ext Time (p_c), s	0.1	0.2	0.1	0.9	0.0	0.2	0.0	5.7

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

HCM 6th TWSC
5: Unity Park Street/"P" Street & West El Camino Avenue

08/03/2020

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱				↱			↱
Traffic Vol, veh/h	0	1632	4	0	865	36	0	0	17	0	0	26
Future Vol, veh/h	0	1632	4	0	865	36	0	0	17	0	0	26
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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1632	4	0	865	36	0	0	17	0	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	818	-	-	451
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	319	0	0	556
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	319	-	-	556
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.9	11.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	319	-	-	-	-	556
HCM Lane V/C Ratio	0.053	-	-	-	-	0.047
HCM Control Delay (s)	16.9	-	-	-	-	11.8
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.1

HCM 6th Signalized Intersection Summary
6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	321	765	437	351	568	574	206	117	127	130	34	42
Future Volume (veh/h)	321	765	437	351	568	574	206	117	127	130	34	42
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	321	765	437	351	568	574	206	117	127	130	34	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	1898	589	440	1280	571	475	583	260	426	528	236
Arrive On Green	0.14	0.37	0.37	0.13	0.36	0.36	0.14	0.16	0.16	0.12	0.15	0.15
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	321	765	437	351	568	574	206	117	127	130	34	42
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.3	10.4	22.5	9.3	11.5	33.9	5.1	2.7	6.9	3.2	0.8	2.2
Cycle Q Clear(g_c), s	8.3	10.4	22.5	9.3	11.5	33.9	5.1	2.7	6.9	3.2	0.8	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	1898	589	440	1280	571	475	583	260	426	528	236
V/C Ratio(X)	0.67	0.40	0.74	0.80	0.44	1.01	0.43	0.20	0.49	0.31	0.06	0.18
Avail Cap(c_a), veh/h	477	1898	589	551	1280	571	477	1178	525	441	1136	507
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	21.8	25.6	39.9	22.9	30.1	37.2	34.0	35.8	37.6	34.4	35.0
Incr Delay (d2), s/veh	3.0	0.1	4.4	5.1	0.1	39.1	0.2	0.1	0.5	0.1	0.0	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	3.6	3.9	8.9	4.1	4.5	18.5	2.2	1.2	2.7	1.4	0.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	21.9	30.1	44.9	23.0	69.2	37.5	34.1	36.3	37.7	34.5	35.2
LnGrp LOS	D	C	C	D	C	F	D	C	D	D	C	D
Approach Vol, veh/h		1523			1493			450			206	
Approach Delay, s/veh		28.4			45.9			36.3			36.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	38.7	18.0	19.3	17.0	39.8	16.6	20.7
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 34	* 13	* 30	15.0	* 32	12.0	* 31
Max Q Clear Time (g_c+I1), s	10.3	35.9	7.1	4.2	11.3	24.5	5.2	8.9
Green Ext Time (p_c), s	0.2	0.0	0.2	0.2	0.3	2.6	0.1	0.6

Intersection Summary			
HCM 6th Ctrl Delay			36.9
HCM 6th LOS			D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗		↰	↑	↱	
Traffic Vol, veh/h	0	60	54	58	171	0
Future Vol, veh/h	0	60	54	58	171	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	54	58	171	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	337	171	171	0	-	0
Stage 1	171	-	-	-	-	-
Stage 2	166	-	-	-	-	-
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	658	873	1406	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	633	873	1406	-	-	-
Mov Cap-2 Maneuver	633	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	3.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	873	-	-
HCM Lane V/C Ratio	0.038	-	0.069	-	-
HCM Control Delay (s)	7.7	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	3.3
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	78	93	58
Demand Flow Rate, veh/h	80	95	59
Vehicles Circulating, veh/h	95	23	0
Vehicles Exiting, veh/h	23	36	175
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.3	3.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	80	95	59
Cap Entry Lane, veh/h	1252	1348	1380
Entry HV Adj Factor	0.975	0.979	0.983
Flow Entry, veh/h	78	93	58
Cap Entry, veh/h	1221	1319	1356
V/C Ratio	0.064	0.070	0.043
Control Delay, s/veh	3.5	3.3	3.0
LOS	A	A	A
95th %tile Queue, veh	0	0	0

INTERSECTION ANALYSIS

BASELINE CONDITIONS

PM PEAK HOUR

HCM 6th Signalized Intersection Summary
1: West El Camino Avenue & Westbound I-80 Ramp

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	268	928	0	442	152
Future Volume (veh/h)	0	268	928	0	442	152
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	268	928	0	442	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1076	1076	0	517	
Arrive On Green	0.00	0.58	0.58	0.00	0.29	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	268	928	0	442	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	3.9	23.0	0.0	12.9	0.0
Cycle Q Clear(g_c), s	0.0	3.9	23.0	0.0	12.9	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1076	1076	0	517	
V/C Ratio(X)	0.00	0.25	0.86	0.00	0.86	
Avail Cap(c_a), veh/h	0	1076	1076	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.8	9.8	0.0	18.4	0.0
Incr Delay (d2), s/veh	0.0	0.6	9.1	0.0	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.1	8.2	0.0	4.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.3	19.0	0.0	23.1	0.0
LnGrp LOS	A	A	B	A	C	
Approach Vol, veh/h		268	928		442	A
Approach Delay, s/veh		6.3	19.0		23.1	
Approach LOS		A	B		C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	35.5	35.5	19.5
Change Period (Y+Rc), s	3.9	3.9	3.5
Max Green Setting (Gmax), s	21.1	21.1	26.5
Max Q Clear Time (g_c+I1), s	5.9	25.0	14.9
Green Ext Time (p_c), s	0.7	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue
08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	637	0	0	734	646	763
Future Volume (veh/h)	637	0	0	734	646	763
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	637	0	0	734	646	763
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	864	0	0	864	834	742
Arrive On Green	0.46	0.00	0.00	0.46	0.47	0.47
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	637	0	0	734	646	763
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	30.6	0.0	0.0	38.2	33.3	51.5
Cycle Q Clear(g_c), s	30.6	0.0	0.0	38.2	33.3	51.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	864	0	0	864	834	742
V/C Ratio(X)	0.74	0.00	0.00	0.85	0.77	1.03
Avail Cap(c_a), veh/h	864	0	0	869	834	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	0.0	26.2	24.4	29.2
Incr Delay (d2), s/veh	5.6	0.0	0.0	10.2	4.2	40.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.8	0.0	0.0	18.1	13.8	26.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.7	0.0	0.0	36.5	28.6	69.7
LnGrp LOS	C	A	A	D	C	F
Approach Vol, veh/h	637			734	1409	
Approach Delay, s/veh	29.7			36.5	50.8	
Approach LOS	C			D	D	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		55.0				55.0		55.0
Change Period (Y+Rc), s		* 4.2				* 4.2		3.5
Max Green Setting (Gmax), s		* 51				* 51		51.5
Max Q Clear Time (g_c+I1), s		32.6				40.2		53.5
Green Ext Time (p_c), s		2.3				2.3		0.0

Intersection Summary			
HCM 6th Ctrl Delay			42.2
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/03/2020

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱		↰	↑	↱
Traffic Volume (veh/h)	165	949	285	114	1045	64	220	5	97	53	4	90
Future Volume (veh/h)	165	949	285	114	1045	64	220	5	97	53	4	90
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	949	285	114	1045	64	220	5	97	53	4	90
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	1308	583	142	1315	587	268	8	154	496	580	491
Arrive On Green	0.07	0.37	0.37	0.08	0.37	0.37	0.08	0.10	0.10	0.28	0.31	0.31
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	78	1519	1781	1870	1585
Grp Volume(v), veh/h	165	949	285	114	1045	64	220	0	102	53	4	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1597	1781	1870	1585
Q Serve(g_s), s	8.4	27.6	16.6	7.6	31.5	3.2	7.5	0.0	7.4	2.7	0.2	3.8
Cycle Q Clear(g_c), s	8.4	27.6	16.6	7.6	31.5	3.2	7.5	0.0	7.4	2.7	0.2	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	125	1308	583	142	1315	587	268	0	162	496	580	491
V/C Ratio(X)	1.32	0.73	0.49	0.80	0.79	0.11	0.82	0.00	0.63	0.11	0.01	0.18
Avail Cap(c_a), veh/h	125	1706	761	143	1741	777	268	0	323	496	580	491
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	1.00	1.00	0.41	0.41	0.41	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	32.7	29.2	54.3	33.7	24.8	54.5	0.0	51.7	32.2	28.6	17.9
Incr Delay (d2), s/veh	190.6	0.7	0.2	13.4	1.0	0.0	18.9	0.0	17.0	0.0	0.0	0.8
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	10.3	11.5	6.1	3.8	13.1	1.2	4.0	0.0	3.7	1.2	0.1	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	246.4	33.4	29.5	67.7	34.7	24.9	73.4	0.0	68.7	32.2	28.7	18.7
LnGrp LOS	F	C	C	E	C	C	E	A	E	C	C	B
Approach Vol, veh/h		1399			1223			322			147	
Approach Delay, s/veh		57.7			37.3			71.9			23.9	
Approach LOS		E			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.8	17.6	14.1	49.6	13.8	42.6	13.8	49.8
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	8.7	* 24	9.6	57.6	9.3	23.7	8.4	* 59
Max Q Clear Time (g_c+I1), s	4.7	9.4	9.6	29.6	9.5	5.8	10.4	33.5
Green Ext Time (p_c), s	0.0	0.6	0.0	4.8	0.0	0.1	0.0	10.9

Intersection Summary	
HCM 6th Ctrl Delay	49.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	73	1022	27	64	1171	60	7	3	32	105	2	22
Future Volume (veh/h)	73	1022	27	64	1171	60	7	3	32	105	2	22
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	1022	27	64	1171	60	7	3	32	105	2	22
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	1372	36	147	1322	590	38	35	376	194	46	506
Arrive On Green	0.10	0.39	0.39	0.08	0.37	0.37	0.02	0.26	0.26	0.11	0.34	0.34
Sat Flow, veh/h	1781	3537	93	1781	3554	1585	1781	138	1468	1781	134	1472
Grp Volume(v), veh/h	73	513	536	64	1171	60	7	0	35	105	0	24
Grp Sat Flow(s),veh/h/ln	1781	1777	1854	1781	1777	1585	1781	0	1606	1781	0	1605
Q Serve(g_s), s	4.6	29.8	29.9	4.1	37.0	3.0	0.5	0.0	2.0	6.7	0.0	1.2
Cycle Q Clear(g_c), s	4.6	29.8	29.9	4.1	37.0	3.0	0.5	0.0	2.0	6.7	0.0	1.2
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.91	1.00		0.92
Lane Grp Cap(c), veh/h	175	689	719	147	1322	590	38	0	411	194	0	552
V/C Ratio(X)	0.42	0.74	0.75	0.44	0.89	0.10	0.19	0.00	0.09	0.54	0.00	0.04
Avail Cap(c_a), veh/h	191	755	788	171	1469	655	181	0	411	200	0	552
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	31.6	31.6	52.4	35.3	24.6	57.7	0.0	34.0	50.6	0.0	26.2
Incr Delay (d2), s/veh	0.1	0.3	0.3	2.0	6.4	0.1	2.3	0.0	0.4	2.7	0.0	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	2.0	12.2	12.7	1.9	16.4	1.1	0.2	0.0	0.8	3.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	32.0	31.9	54.5	41.7	24.7	60.1	0.0	34.4	53.3	0.0	26.4
LnGrp LOS	D	C	C	D	D	C	E	A	C	D	A	C
Approach Vol, veh/h		1122			1295			42			129	
Approach Delay, s/veh		33.2			41.5			38.7			48.3	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	36.1	14.4	51.9	7.0	46.6	16.3	50.0
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4
Max Green Setting (Gmax), s	13.5	24.2	11.5	51.0	12.2	25.5	12.9	49.6
Max Q Clear Time (g_c+I1), s	8.7	4.0	6.1	31.9	2.5	3.2	6.6	39.0
Green Ext Time (p_c), s	0.1	0.1	0.0	6.1	0.0	0.1	0.1	5.6

Intersection Summary	
HCM 6th Ctrl Delay	38.2
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱				↱			↱
Traffic Vol, veh/h	0	1150	10	0	1314	89	0	0	14	0	0	13
Future Vol, veh/h	0	1150	10	0	1314	89	0	0	14	0	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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1150	10	0	1314	89	0	0	14	0	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	580	-	-	702
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	458	0	0	381
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	458	-	-	381
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.1	14.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	458	-	-	-	-	381
HCM Lane V/C Ratio	0.031	-	-	-	-	0.034
HCM Control Delay (s)	13.1	-	-	-	-	14.8
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

HCM 6th Signalized Intersection Summary
6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	82	847	215	245	584	102	374	60	371	450	117	280
Future Volume (veh/h)	82	847	215	245	584	102	374	60	371	450	117	280
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	847	215	245	584	102	374	60	371	450	117	280
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	1098	341	478	792	353	519	916	409	541	936	417
Arrive On Green	0.13	0.22	0.22	0.14	0.22	0.22	0.15	0.26	0.26	0.16	0.26	0.26
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	82	847	215	245	584	102	374	60	371	450	117	280
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	1.8	13.5	10.7	5.7	13.2	4.6	8.9	1.1	19.6	10.9	2.2	13.7
Cycle Q Clear(g_c), s	1.8	13.5	10.7	5.7	13.2	4.6	8.9	1.1	19.6	10.9	2.2	13.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	1098	341	478	792	353	519	916	409	541	936	417
V/C Ratio(X)	0.18	0.77	0.63	0.51	0.74	0.29	0.72	0.07	0.91	0.83	0.13	0.67
Avail Cap(c_a), veh/h	519	1545	480	479	1043	465	722	1260	562	838	1375	613
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	32.0	30.9	34.6	31.3	27.9	35.1	24.2	31.1	35.4	24.3	28.5
Incr Delay (d2), s/veh	0.1	0.9	0.7	0.4	1.2	0.2	1.0	0.0	12.5	2.3	0.0	0.7
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	0.7	5.3	4.0	2.3	5.4	1.7	3.7	0.5	8.7	4.7	0.9	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	32.9	31.6	35.0	32.5	28.1	36.1	24.3	43.6	37.7	24.3	29.2
LnGrp LOS	C	C	C	D	C	C	D	C	D	D	C	C
Approach Vol, veh/h		1144			931			805			847	
Approach Delay, s/veh		32.7			32.7			38.7			33.1	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	24.1	18.1	28.1	17.0	23.4	18.6	27.6
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 25	* 18	* 34	12.0	* 26	21.0	* 31
Max Q Clear Time (g_c+I1), s	3.8	15.2	10.9	15.7	7.7	15.5	12.9	21.6
Green Ext Time (p_c), s	0.1	1.9	0.5	0.9	0.2	3.1	0.6	0.7

Intersection Summary	
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		↰	↑	↳	
Traffic Vol, veh/h	0	59	68	239	0	89
Future Vol, veh/h	0	59	68	239	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	59	68	239	0	89

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	420	45	89	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	375	-	-	-	-	-
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	590	1025	1506	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	563	1025	1506	-	-	-
Mov Cap-2 Maneuver	563	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	695	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	1025	-	-
HCM Lane V/C Ratio	0.045	-	0.058	-	-
HCM Control Delay (s)	7.5	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	3.8
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	44	45	239
Demand Flow Rate, veh/h	45	46	243
Vehicles Circulating, veh/h	46	75	0
Vehicles Exiting, veh/h	75	168	91
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.1	3.2	4.1
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	45	46	243
Cap Entry Lane, veh/h	1317	1278	1380
Entry HV Adj Factor	0.978	0.978	0.984
Flow Entry, veh/h	44	45	239
Cap Entry, veh/h	1287	1250	1357
V/C Ratio	0.034	0.036	0.176
Control Delay, s/veh	3.1	3.2	4.1
LOS	A	A	A
95th %tile Queue, veh	0	0	1

INTERSECTION ANALYSIS

BASELINE PLUS PROJECT CONDITIONS

AM PEAK HOUR

HCM 6th Signalized Intersection Summary
1: West El Camino Avenue & Westbound I-80 Ramp

08/03/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	468	311	0	765	96
Future Volume (veh/h)	0	468	311	0	765	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	468	311	0	765	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	764	764	0	814	
Arrive On Green	0.00	0.41	0.41	0.00	0.46	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	468	311	0	765	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	10.9	6.5	0.0	22.5	0.0
Cycle Q Clear(g_c), s	0.0	10.9	6.5	0.0	22.5	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	764	764	0	814	
V/C Ratio(X)	0.00	0.61	0.41	0.00	0.94	
Avail Cap(c_a), veh/h	0	764	764	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.8	11.6	0.0	14.2	0.0
Incr Delay (d2), s/veh	0.0	3.7	1.6	0.0	17.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.2	2.4	0.0	10.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	16.5	13.2	0.0	31.5	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h		468	311		765	A
Approach Delay, s/veh		16.5	13.2		31.5	
Approach LOS		B	B		C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	26.4	26.4	28.6
Change Period (Y+Rc), s	3.9	3.9	3.5
Max Green Setting (Gmax), s	21.1	21.1	26.5
Max Q Clear Time (g_c+I1), s	12.9	8.5	24.5
Green Ext Time (p_c), s	1.1	0.8	0.7

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue

08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	1115	0	0	695	117	429
Future Volume (veh/h)	1115	0	0	695	117	429
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1115	0	0	695	117	429
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	1374	0	0	1374	348	310
Arrive On Green	0.73	0.00	0.00	0.73	0.20	0.20
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	1115	0	0	695	117	429
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	43.1	0.0	0.0	17.3	6.2	21.5
Cycle Q Clear(g_c), s	43.1	0.0	0.0	17.3	6.2	21.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1374	0	0	1374	348	310
V/C Ratio(X)	0.81	0.00	0.00	0.51	0.34	1.38
Avail Cap(c_a), veh/h	1374	0	0	1379	348	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	0.0	0.0	6.2	38.1	44.3
Incr Delay (d2), s/veh	5.3	0.0	0.0	1.3	0.2	192.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	0.0	0.0	5.6	2.6	24.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.9	0.0	0.0	7.5	38.3	236.2
LnGrp LOS	B	A	A	A	D	F
Approach Vol, veh/h	1115			695	546	
Approach Delay, s/veh	14.9			7.5	193.8	
Approach LOS	B			A	F	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	85.0	85.0	25.0
Change Period (Y+Rc), s	* 4.2	* 4.2	3.5
Max Green Setting (Gmax), s	* 81	* 81	21.5
Max Q Clear Time (g_c+I1), s	45.1	19.3	23.5
Green Ext Time (p_c), s	6.5	2.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	54.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/25/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	308	1222	71	57	806	46	438	9	122	161	18	170
Future Volume (veh/h)	308	1222	71	57	806	46	438	9	122	161	18	170
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	308	1222	71	57	806	46	438	9	122	161	18	170
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	1379	615	99	882	393	500	11	154	499	461	391
Arrive On Green	0.19	0.39	0.39	0.06	0.25	0.25	0.14	0.10	0.10	0.28	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	110	1492	1781	1870	1585
Grp Volume(v), veh/h	308	1222	71	57	806	46	438	0	131	161	18	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1602	1781	1870	1585
Q Serve(g_s), s	20.4	38.5	3.4	3.7	26.5	2.7	14.9	0.0	9.6	8.6	0.9	6.9
Cycle Q Clear(g_c), s	20.4	38.5	3.4	3.7	26.5	2.7	14.9	0.0	9.6	8.6	0.9	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		1.00
Lane Grp Cap(c), veh/h	335	1379	615	99	882	393	500	0	166	499	461	391
V/C Ratio(X)	0.92	0.89	0.12	0.57	0.91	0.12	0.88	0.00	0.79	0.32	0.04	0.44
Avail Cap(c_a), veh/h	408	1522	679	99	906	404	541	0	367	499	461	391
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	1.00	1.00	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	34.3	23.5	55.3	43.9	34.9	50.2	0.0	52.5	34.2	34.4	15.2
Incr Delay (d2), s/veh	21.1	5.8	0.0	8.4	12.3	0.2	14.7	0.0	31.0	0.1	0.2	3.5
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	10.7	16.8	1.3	1.9	12.7	1.0	7.4	0.0	5.3	3.8	0.4	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	40.1	23.6	63.6	56.2	35.1	65.0	0.0	83.5	34.3	34.6	18.7
LnGrp LOS	E	D	C	E	E	D	E	A	F	C	C	B
Approach Vol, veh/h		1601			909			569			349	
Approach Delay, s/veh		44.9			55.6			69.2			26.7	
Approach LOS		D			E			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.0	17.8	11.2	52.0	21.9	35.0	28.0	35.2
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	14.6	* 28	6.7	51.4	18.8	23.3	27.5	* 31
Max Q Clear Time (g_c+I1), s	10.6	11.6	5.7	40.5	16.9	8.9	22.4	28.5
Green Ext Time (p_c), s	0.1	0.8	0.0	4.3	0.5	0.3	0.2	1.3

Intersection Summary			
HCM 6th Ctrl Delay			49.9
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	15	1320	35	196	850	25	13	0	47	122	3	46
Future Volume (veh/h)	15	1320	35	196	850	25	13	0	47	122	3	46
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	1320	35	196	850	25	13	0	47	122	3	46
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	1368	36	223	1670	745	64	0	337	197	28	431
Arrive On Green	0.04	0.39	0.39	0.13	0.47	0.47	0.04	0.00	0.21	0.11	0.29	0.29
Sat Flow, veh/h	1781	3537	94	1781	3554	1585	1781	0	1585	1781	98	1502
Grp Volume(v), veh/h	15	663	692	196	850	25	13	0	47	122	0	49
Grp Sat Flow(s),veh/h/ln	1781	1777	1853	1781	1777	1585	1781	0	1585	1781	0	1600
Q Serve(g_s), s	1.0	43.8	43.9	13.0	20.0	1.0	0.9	0.0	2.9	7.8	0.0	2.7
Cycle Q Clear(g_c), s	1.0	43.8	43.9	13.0	20.0	1.0	0.9	0.0	2.9	7.8	0.0	2.7
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	75	687	717	223	1670	745	64	0	337	197	0	459
V/C Ratio(X)	0.20	0.96	0.97	0.88	0.51	0.03	0.20	0.00	0.14	0.62	0.00	0.11
Avail Cap(c_a), veh/h	191	690	720	245	1670	745	181	0	337	200	0	459
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.5	36.0	36.0	51.6	22.2	17.1	56.2	0.0	38.4	51.0	0.0	31.5
Incr Delay (d2), s/veh	0.1	4.6	4.6	26.8	0.3	0.0	1.6	0.0	0.9	5.6	0.0	0.5
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	0.4	18.7	19.6	7.3	8.0	0.4	0.4	0.0	1.2	3.8	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	40.6	40.6	78.4	22.4	17.2	57.8	0.0	39.2	56.5	0.0	31.9
LnGrp LOS	E	D	D	E	C	B	E	A	D	E	A	C
Approach Vol, veh/h		1370			1071			60			171	
Approach Delay, s/veh		40.8			32.5			43.2			49.5	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	30.9	19.5	51.8	8.8	39.9	9.6	61.8
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4
Max Green Setting (Gmax), s	13.5	23.6	16.5	46.6	12.2	24.9	12.9	50.2
Max Q Clear Time (g_c+I1), s	9.8	4.9	15.0	45.9	2.9	4.7	3.0	22.0
Green Ext Time (p_c), s	0.1	0.2	0.1	0.6	0.0	0.2	0.0	6.1

Intersection Summary			
HCM 6th Ctrl Delay			38.1
HCM 6th LOS			D

HCM 6th TWSC
5: Unity Park Street/"P" Street & West El Camino Avenue

08/03/2020

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱				↱			↱
Traffic Vol, veh/h	0	1643	4	0	914	36	0	0	17	0	0	26
Future Vol, veh/h	0	1643	4	0	914	36	0	0	17	0	0	26
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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1643	4	0	914	36	0	0	17	0	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	824	-	-	475
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	316	0	0	536
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	316	-	-	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	316	-	-	-	-	536
HCM Lane V/C Ratio	0.054	-	-	-	-	0.049
HCM Control Delay (s)	17	-	-	-	-	12.1
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.2

HCM 6th Signalized Intersection Summary
6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	324	767	445	351	602	574	220	117	127	130	34	44
Future Volume (veh/h)	324	767	445	351	602	574	220	117	127	130	34	44
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	324	767	445	351	602	574	220	117	127	130	34	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	1898	589	440	1279	571	476	583	260	426	528	236
Arrive On Green	0.14	0.37	0.37	0.13	0.36	0.36	0.14	0.16	0.16	0.12	0.15	0.15
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	324	767	445	351	602	574	220	117	127	130	34	44
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.4	10.5	23.1	9.3	12.3	33.9	5.5	2.7	6.9	3.2	0.8	2.3
Cycle Q Clear(g_c), s	8.4	10.5	23.1	9.3	12.3	33.9	5.5	2.7	6.9	3.2	0.8	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	1898	589	440	1279	571	476	583	260	426	528	236
V/C Ratio(X)	0.68	0.40	0.76	0.80	0.47	1.01	0.46	0.20	0.49	0.31	0.06	0.19
Avail Cap(c_a), veh/h	477	1898	589	551	1279	571	477	1178	525	440	1136	507
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	21.9	25.8	39.9	23.2	30.1	37.4	34.0	35.8	37.6	34.4	35.1
Incr Delay (d2), s/veh	3.2	0.1	5.0	5.1	0.1	39.1	0.3	0.1	0.5	0.1	0.0	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	3.6	3.9	9.2	4.1	4.8	18.5	2.3	1.2	2.7	1.4	0.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	21.9	30.8	45.0	23.3	69.2	37.7	34.1	36.3	37.8	34.5	35.2
LnGrp LOS	D	C	C	D	C	F	D	C	D	D	C	D
Approach Vol, veh/h		1536			1527			464			208	
Approach Delay, s/veh		28.7			45.6			36.4			36.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	38.7	18.1	19.3	17.0	39.8	16.6	20.8
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 34	* 13	* 30	15.0	* 32	12.0	* 31
Max Q Clear Time (g_c+I1), s	10.4	35.9	7.5	4.3	11.3	25.1	5.2	8.9
Green Ext Time (p_c), s	0.2	0.0	0.2	0.2	0.3	2.5	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	37.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
7: Orchard Lane & Orchard Court

08/03/2020

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		↰	↑	↱	
Traffic Vol, veh/h	0	58	62	57	163	2
Future Vol, veh/h	0	58	62	57	163	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	58	62	57	163	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	345	164	165	0	-	0
Stage 1	164	-	-	-	-	-
Stage 2	181	-	-	-	-	-
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	652	881	1413	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	850	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	623	881	1413	-	-	-
Mov Cap-2 Maneuver	623	-	-	-	-	-
Stage 1	827	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	9.4		4		0	
HCM LOS	A					

Minor Lane/Major Mvmt		NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1413	-	881	-	-
HCM Lane V/C Ratio		0.044	-	0.066	-	-
HCM Control Delay (s)		7.7	-	9.4	-	-
HCM Lane LOS		A	-	A	-	-
HCM 95th %tile Q(veh)		0.1	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	3.2
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	71	94	57
Demand Flow Rate, veh/h	72	96	58
Vehicles Circulating, veh/h	96	22	0
Vehicles Exiting, veh/h	22	36	168
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.4	3.3	3.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	72	96	58
Cap Entry Lane, veh/h	1251	1349	1380
Entry HV Adj Factor	0.986	0.979	0.983
Flow Entry, veh/h	71	94	57
Cap Entry, veh/h	1234	1321	1356
V/C Ratio	0.058	0.071	0.042
Control Delay, s/veh	3.4	3.3	3.0
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1543	1279	234	0	221
Future Vol, veh/h	0	1543	1279	234	0	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1543	1279	234	0	221

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	640
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	418
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	418
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	418
HCM Lane V/C Ratio	-	-	-	0.529
HCM Control Delay (s)	-	-	-	22.9
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	3

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
Traffic Vol, veh/h	8	144	109	111	204	16
Future Vol, veh/h	8	144	109	111	204	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	144	109	111	204	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	541	212	220	0	-	0
Stage 1	212	-	-	-	-	-
Stage 2	329	-	-	-	-	-
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	502	828	1349	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	459	828	1349	-	-	-
Mov Cap-2 Maneuver	459	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	10.6		3.9		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1349	-	794	-	-
HCM Lane V/C Ratio	0.081	-	0.191	-	-
HCM Control Delay (s)	7.9	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.7	-	-

HCM 6th TWSC
11: Drive 1 & Orchard Court

08/03/2020

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	54	4	4	60	2	4
Future Vol, veh/h	54	4	4	60	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	4	4	60	2	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	124	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	68	-
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	-	-	1546	-	871	1011
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	955	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	868	1011
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	952	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	958	-	-	1546	-
HCM Lane V/C Ratio	0.006	-	-	0.003	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

1: West El Camino Avenue & Westbound I-80 Ramp

	→	←	↘	↙
Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	468	311	765	96
v/c Ratio	0.65	0.43	0.90	0.06
Control Delay	19.7	15.4	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.7	15.4	29.5	0.1
Queue Length 50th (ft)	134	80	183	0
Queue Length 95th (ft)	208	129	#421	0
Internal Link Dist (ft)	294	252	765	
Turn Bay Length (ft)				800
Base Capacity (vph)	741	741	877	1583
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.42	0.87	0.06

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
2: Eastbound I-80 Ramp & West El Camino Avenue

08/25/2020

	→	←	↰	↱
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1115	695	117	429
v/c Ratio	0.86	0.53	0.28	0.89
Control Delay	20.8	9.6	37.8	48.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.8	9.6	37.8	48.9
Queue Length 50th (ft)	622	246	64	188
Queue Length 95th (ft)	670	248	127	#425
Internal Link Dist (ft)	249	128	477	
Turn Bay Length (ft)				150
Base Capacity (vph)	1368	1373	413	483
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.51	0.28	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
3: Orchard Lane & West El Camino Avenue

08/25/2020

	↗	→	↘	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	308	1222	71	57	806	46	438	131	161	18	170
v/c Ratio	0.86	0.85	0.10	0.38	0.78	0.08	0.79	0.34	0.57	0.05	0.40
Control Delay	68.0	38.1	0.3	36.6	38.4	4.2	59.6	12.9	55.1	46.7	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	38.1	0.3	36.6	38.4	4.2	59.6	12.9	55.1	46.7	10.2
Queue Length 50th (ft)	229	431	0	42	344	2	165	6	117	12	0
Queue Length 95th (ft)	#348	512	0	86	417	26	#245	66	186	35	64
Internal Link Dist (ft)		183			844			420		204	
Turn Bay Length (ft)	295		240	295		135	155		70		240
Base Capacity (vph)	410	1547	778	152	1042	579	566	480	283	410	481
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.79	0.09	0.38	0.77	0.08	0.77	0.27	0.57	0.04	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
4: West River Drive/River Oaks Way & West El Camino Avenue

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	1355	196	850	25	13	47	122	49
v/c Ratio	0.08	0.97	0.84	0.48	0.03	0.07	0.09	0.61	0.10
Control Delay	34.1	58.0	80.6	21.9	0.1	49.9	0.4	64.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	58.0	80.6	21.9	0.1	49.9	0.4	64.8	12.6
Queue Length 50th (ft)	9	579	149	189	0	9	0	91	2
Queue Length 95th (ft)	m13	#714	#271	326	0	30	0	#158	35
Internal Link Dist (ft)		844		641			474		441
Turn Bay Length (ft)			155		165	100		100	
Base Capacity (vph)	190	1391	243	1788	851	179	510	199	498
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.97	0.81	0.48	0.03	0.07	0.09	0.61	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

6: Gateway Oaks Drive & West El Camino Avenue

08/25/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	324	767	445	351	602	574	220	117	127	130	34	44
v/c Ratio	0.58	0.62	0.62	0.62	0.69	0.70	0.30	0.18	0.32	0.25	0.05	0.12
Control Delay	36.2	29.4	6.9	36.5	31.6	7.4	31.1	29.2	8.5	32.5	29.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	29.4	6.9	36.5	31.6	7.4	31.1	29.2	8.5	32.5	29.4	0.6
Queue Length 50th (ft)	77	123	0	84	143	0	51	25	0	29	7	0
Queue Length 95th (ft)	129	168	69	135	196	77	90	52	46	59	21	0
Internal Link Dist (ft)		185			456			405			335	
Turn Bay Length (ft)	175		150	190		190	140		140	230		230
Base Capacity (vph)	562	2032	899	649	1512	1005	734	1392	699	519	1343	674
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.38	0.49	0.54	0.40	0.57	0.30	0.08	0.18	0.25	0.03	0.07

Intersection Summary

INTERSECTION ANALYSIS

BASELINE PLUS PROJECT CONDITIONS

PM PEAK HOUR

HCM 6th Signalized Intersection Summary
1: West El Camino Avenue & Westbound I-80 Ramp

08/03/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	294	932	0	454	152
Future Volume (veh/h)	0	294	932	0	454	152
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	294	932	0	454	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1064	1064	0	529	
Arrive On Green	0.00	0.57	0.57	0.00	0.30	0.00
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	294	932	0	454	0
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	4.4	23.6	0.0	13.2	0.0
Cycle Q Clear(g_c), s	0.0	4.4	23.6	0.0	13.2	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1064	1064	0	529	
V/C Ratio(X)	0.00	0.28	0.88	0.00	0.86	
Avail Cap(c_a), veh/h	0	1064	1064	0	858	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	6.1	10.2	0.0	18.3	0.0
Incr Delay (d2), s/veh	0.0	0.6	10.1	0.0	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.3	8.7	0.0	5.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.7	20.3	0.0	23.3	0.0
LnGrp LOS	A	A	C	A	C	
Approach Vol, veh/h		294	932		454	A
Approach Delay, s/veh		6.7	20.3		23.3	
Approach LOS		A	C		C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	35.2	35.2	19.8
Change Period (Y+Rc), s	3.9	3.9	3.5
Max Green Setting (Gmax), s	21.1	21.1	26.5
Max Q Clear Time (g_c+I1), s	6.4	25.6	15.2
Green Ext Time (p_c), s	0.8	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Eastbound I-80 Ramp & West El Camino Avenue

08/03/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	674	0	0	747	646	759
Future Volume (veh/h)	674	0	0	747	646	759
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	0	0	1870	1870	1870
Adj Flow Rate, veh/h	674	0	0	747	646	759
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	864	0	0	864	834	742
Arrive On Green	0.46	0.00	0.00	0.46	0.47	0.47
Sat Flow, veh/h	1870	0	0	1870	1781	1585
Grp Volume(v), veh/h	674	0	0	747	646	759
Grp Sat Flow(s),veh/h/ln	1870	0	0	1870	1781	1585
Q Serve(g_s), s	33.4	0.0	0.0	39.4	33.3	51.5
Cycle Q Clear(g_c), s	33.4	0.0	0.0	39.4	33.3	51.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	864	0	0	864	834	742
V/C Ratio(X)	0.78	0.00	0.00	0.86	0.77	1.02
Avail Cap(c_a), veh/h	864	0	0	869	834	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	0.0	26.5	24.4	29.2
Incr Delay (d2), s/veh	6.9	0.0	0.0	11.3	4.2	38.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	0.0	0.0	18.8	13.8	25.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.8	0.0	0.0	37.8	28.6	68.2
LnGrp LOS	C	A	A	D	C	F
Approach Vol, veh/h	674			747	1405	
Approach Delay, s/veh	31.8			37.8	50.0	
Approach LOS	C			D	D	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	55.0	55.0	55.0
Change Period (Y+Rc), s	* 4.2	* 4.2	3.5
Max Green Setting (Gmax), s	* 51	* 51	51.5
Max Q Clear Time (g_c+I1), s	35.4	41.4	53.5
Green Ext Time (p_c), s	2.4	2.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/25/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	290	893	285	114	1074	47	221	5	97	126	6	77
Future Volume (veh/h)	290	893	285	114	1074	47	221	5	97	126	6	77
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	290	893	285	114	1074	47	221	5	97	126	6	77
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	1525	680	144	1153	514	281	8	154	384	456	386
Arrive On Green	0.18	0.43	0.43	0.08	0.32	0.32	0.08	0.10	0.10	0.22	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	78	1519	1781	1870	1585
Grp Volume(v), veh/h	290	893	285	114	1074	47	221	0	102	126	6	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1597	1781	1870	1585
Q Serve(g_s), s	19.2	23.0	15.0	7.5	35.1	2.5	7.5	0.0	7.4	7.2	0.3	3.0
Cycle Q Clear(g_c), s	19.2	23.0	15.0	7.5	35.1	2.5	7.5	0.0	7.4	7.2	0.3	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	317	1525	680	144	1153	514	281	0	162	384	456	386
V/C Ratio(X)	0.91	0.59	0.42	0.79	0.93	0.09	0.79	0.00	0.63	0.33	0.01	0.20
Avail Cap(c_a), veh/h	379	1525	680	226	1173	523	343	0	309	384	456	386
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	1.00	1.00	0.40	0.40	0.40	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	26.1	23.8	54.1	39.2	28.2	54.1	0.0	51.7	39.7	34.4	15.0
Incr Delay (d2), s/veh	22.0	0.4	0.2	5.6	6.2	0.0	10.7	0.0	17.0	0.2	0.1	1.2
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	10.2	9.3	5.4	3.5	15.6	0.9	3.7	0.0	3.7	3.2	0.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	26.5	24.0	59.8	45.5	28.3	64.8	0.0	68.7	39.9	34.5	16.2
LnGrp LOS	E	C	C	E	D	C	E	A	E	D	C	B
Approach Vol, veh/h		1468			1235			323			209	
Approach Delay, s/veh		34.7			46.1			66.0			31.0	
Approach LOS		C			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.3	17.6	14.2	56.9	14.3	34.6	26.8	44.3
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	11.9	* 23	15.2	49.9	11.9	23.2	25.5	* 40
Max Q Clear Time (g_c+I1), s	9.2	9.4	9.5	25.0	9.5	5.0	21.2	37.1
Green Ext Time (p_c), s	0.0	0.5	0.2	4.4	0.2	0.1	0.2	1.8

Intersection Summary			
HCM 6th Ctrl Delay			42.0
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: West River Drive/River Oaks Way & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	73	1048	26	64	1183	60	6	3	32	104	2	22
Future Volume (veh/h)	73	1048	26	64	1183	60	6	3	32	104	2	22
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	1048	26	64	1183	60	6	3	32	104	2	22
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	1384	34	147	1331	594	33	35	372	194	46	506
Arrive On Green	0.10	0.39	0.39	0.08	0.37	0.37	0.02	0.25	0.25	0.11	0.34	0.34
Sat Flow, veh/h	1781	3543	88	1781	3554	1585	1781	138	1468	1781	134	1472
Grp Volume(v), veh/h	73	525	549	64	1183	60	6	0	35	104	0	24
Grp Sat Flow(s),veh/h/ln	1781	1777	1855	1781	1777	1585	1781	0	1606	1781	0	1605
Q Serve(g_s), s	4.6	30.7	30.7	4.1	37.4	3.0	0.4	0.0	2.0	6.6	0.0	1.2
Cycle Q Clear(g_c), s	4.6	30.7	30.7	4.1	37.4	3.0	0.4	0.0	2.0	6.6	0.0	1.2
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.91	1.00		0.92
Lane Grp Cap(c), veh/h	175	694	724	147	1331	594	33	0	407	194	0	552
V/C Ratio(X)	0.42	0.76	0.76	0.44	0.89	0.10	0.18	0.00	0.09	0.54	0.00	0.04
Avail Cap(c_a), veh/h	191	755	788	171	1469	655	181	0	407	200	0	552
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	31.7	31.7	52.4	35.2	24.4	58.0	0.0	34.2	50.6	0.0	26.2
Incr Delay (d2), s/veh	0.1	0.4	0.4	2.0	6.6	0.1	2.6	0.0	0.4	2.6	0.0	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	2.0	12.6	13.1	1.9	16.6	1.1	0.2	0.0	0.8	3.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	32.0	32.0	54.5	41.8	24.5	60.6	0.0	34.6	53.2	0.0	26.4
LnGrp LOS	D	C	C	D	D	C	E	A	C	D	A	C
Approach Vol, veh/h		1147			1307			41			128	
Approach Delay, s/veh		33.2			41.6			38.4			48.2	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	35.8	14.4	52.3	6.7	46.7	16.3	50.4
Change Period (Y+Rc), s	4.5	5.4	4.5	5.4	4.5	5.4	4.5	5.4
Max Green Setting (Gmax), s	13.5	24.2	11.5	51.0	12.2	25.5	12.9	49.6
Max Q Clear Time (g_c+I1), s	8.6	4.0	6.1	32.7	2.4	3.2	6.6	39.4
Green Ext Time (p_c), s	0.1	0.1	0.0	6.2	0.0	0.1	0.1	5.5

Intersection Summary			
HCM 6th Ctrl Delay			38.2
HCM 6th LOS			D

HCM 6th TWSC
5: Unity Park Street/"P" Street & West El Camino Avenue

08/03/2020

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱				↱			↱
Traffic Vol, veh/h	0	1175	10	0	1326	89	0	0	14	0	0	13
Future Vol, veh/h	0	1175	10	0	1326	89	0	0	14	0	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	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1175	10	0	1326	89	0	0	14	0	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	593	-	-	708
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	449	0	0	377
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	449	-	-	377
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.3	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	449	-	-	-	-	377
HCM Lane V/C Ratio	0.031	-	-	-	-	0.034
HCM Control Delay (s)	13.3	-	-	-	-	14.9
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

HCM 6th Signalized Intersection Summary
6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	84	862	223	245	575	102	387	60	371	450	117	288
Future Volume (veh/h)	84	862	223	245	575	102	387	60	371	450	117	288
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	862	223	245	575	102	387	60	371	450	117	288
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	448	1111	345	475	797	355	516	916	408	541	938	418
Arrive On Green	0.13	0.22	0.22	0.14	0.22	0.22	0.15	0.26	0.26	0.16	0.26	0.26
Sat Flow, veh/h	3456	5106	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	84	862	223	245	575	102	387	60	371	450	117	288
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	1.9	13.8	11.2	5.7	13.0	4.6	9.3	1.1	19.8	11.0	2.2	14.2
Cycle Q Clear(g_c), s	1.9	13.8	11.2	5.7	13.0	4.6	9.3	1.1	19.8	11.0	2.2	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	448	1111	345	475	797	355	516	916	408	541	938	418
V/C Ratio(X)	0.19	0.78	0.65	0.52	0.72	0.29	0.75	0.07	0.91	0.83	0.12	0.69
Avail Cap(c_a), veh/h	516	1536	477	476	1036	462	718	1252	559	833	1367	610
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	32.1	31.0	34.9	31.3	28.0	35.5	24.4	31.3	35.6	24.4	28.8
Incr Delay (d2), s/veh	0.1	1.1	0.8	0.4	1.1	0.2	1.6	0.0	12.7	2.5	0.0	0.8
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	0.8	5.4	4.2	2.3	5.3	1.7	4.0	0.5	8.7	4.7	0.9	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	33.1	31.8	35.3	32.3	28.2	37.1	24.4	44.1	38.1	24.4	29.6
LnGrp LOS	C	C	C	D	C	C	D	C	D	D	C	C
Approach Vol, veh/h		1169			922			818			855	
Approach Delay, s/veh		32.9			32.7			39.3			33.4	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	24.3	18.1	28.3	17.0	23.8	18.6	27.7
Change Period (Y+Rc), s	* 5.1	* 4.8	* 5.1	* 5.3	5.0	* 4.8	5.0	* 5.3
Max Green Setting (Gmax), s	* 13	* 25	* 18	* 34	12.0	* 26	21.0	* 31
Max Q Clear Time (g_c+I1), s	3.9	15.0	11.3	16.2	7.7	15.8	13.0	21.8
Green Ext Time (p_c), s	0.1	1.9	0.5	0.9	0.2	3.1	0.6	0.7

Intersection Summary	
HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		↰	↑	↱	
Traffic Vol, veh/h	1	51	59	197	64	2
Future Vol, veh/h	1	51	59	197	64	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	51	59	197	64	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	380	65	66	0	-	0
Stage 1	65	-	-	-	-	-
Stage 2	315	-	-	-	-	-
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	622	999	1536	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	598	999	1536	-	-	-
Mov Cap-2 Maneuver	598	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	740	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1536	-	986	-	-
HCM Lane V/C Ratio	0.038	-	0.053	-	-
HCM Control Delay (s)	7.4	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	3.6
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	20	46	198
Demand Flow Rate, veh/h	20	47	202
Vehicles Circulating, veh/h	47	33	0
Vehicles Exiting, veh/h	33	169	67
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	2.9	3.0	3.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	20	47	202
Cap Entry Lane, veh/h	1315	1334	1380
Entry HV Adj Factor	1.000	0.979	0.980
Flow Entry, veh/h	20	46	198
Cap Entry, veh/h	1315	1306	1353
V/C Ratio	0.015	0.035	0.146
Control Delay, s/veh	2.9	3.0	3.8
LOS	A	A	A
95th %tile Queue, veh	0	0	1

HCM 6th TWSC
9: West El Camino Avenue

08/25/2020

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1434	1217	138	0	91
Future Vol, veh/h	0	1434	1217	138	0	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1434	1217	138	0	91

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	609
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	438
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	438
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	438
HCM Lane V/C Ratio	-	-	-	0.208
HCM Control Delay (s)	-	-	-	15.4
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.8

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰↱			↰	↱	
Traffic Vol, veh/h	11	98	80	244	108	6
Future Vol, veh/h	11	98	80	244	108	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	98	80	244	108	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	515	111	114	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	404	-	-	-	-	-
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	520	942	1475	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	487	942	1475	-	-	-
Mov Cap-2 Maneuver	487	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	9.8		1.9		0	
HCM LOS	A					

Minor Lane/Major Mvmt		NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1475	-	861	-	-
HCM Lane V/C Ratio		0.054	-	0.127	-	-
HCM Control Delay (s)		7.6	0	9.8	-	-
HCM Lane LOS		A	A	A	-	-
HCM 95th %tile Q(veh)		0.2	-	0.4	-	-

HCM 6th TWSC
11: Drive 1 & Orchard Court

08/03/2020

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	47	4	4	57	2	5
Future Vol, veh/h	47	4	4	57	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	4	4	57	2	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	51	0	114	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	65	-
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	-	-	1555	-	882	1020
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1555	-	879	1020
Mov Cap-2 Maneuver	-	-	-	-	879	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	955	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		8.7	
HCM LOS					A	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	975	-	-	1555	-
HCM Lane V/C Ratio	0.007	-	-	0.003	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Queues
1: West El Camino Avenue & Westbound I-80 Ramp

08/03/2020

	→	←	↘	↙
Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	294	932	454	152
v/c Ratio	0.31	0.98	0.73	0.10
Control Delay	10.4	44.0	21.9	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	44.0	21.9	0.1
Queue Length 50th (ft)	51	274	124	0
Queue Length 95th (ft)	118	#591	172	0
Internal Link Dist (ft)	294	252	765	
Turn Bay Length (ft)				800
Base Capacity (vph)	953	953	852	1583
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.98	0.53	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2: Eastbound I-80 Ramp & West El Camino Avenue

	→	←	↰	↱
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	674	747	646	759
v/c Ratio	0.75	0.82	0.82	0.96
Control Delay	30.2	34.4	36.1	46.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	34.4	36.1	46.5
Queue Length 50th (ft)	397	466	365	400
Queue Length 95th (ft)	549	#694	529	#678
Internal Link Dist (ft)	249	128	477	
Turn Bay Length (ft)				150
Base Capacity (vph)	905	910	831	828
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.82	0.78	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Orchard Lane & West El Camino Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	302	893	285	114	1074	47	221	102	126	6	77
v/c Ratio	0.88	0.57	0.33	0.56	0.83	0.07	0.64	0.31	0.61	0.02	0.19
Control Delay	73.6	26.5	3.5	26.2	35.4	2.0	60.7	13.7	62.5	44.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.6	26.5	3.5	26.2	35.4	2.0	60.7	13.7	62.5	44.7	1.1
Queue Length 50th (ft)	224	243	0	75	468	0	84	4	95	4	0
Queue Length 95th (ft)	#363	341	51	m89	534	m0	128	57	154	17	0
Internal Link Dist (ft)		183			844			420		204	
Turn Bay Length (ft)	295		240	295		135	155		70		240
Base Capacity (vph)	376	1587	867	237	1302	684	356	410	208	394	455
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.56	0.33	0.48	0.82	0.07	0.62	0.25	0.61	0.02	0.17

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

4: West River Drive/River Oaks Way & West El Camino Avenue

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	1074	64	1183	60	6	35	104	24
v/c Ratio	0.38	0.76	0.39	0.86	0.09	0.03	0.08	0.52	0.04
Control Delay	39.0	37.3	58.4	41.0	0.9	49.2	15.0	60.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	37.3	58.4	41.0	0.9	49.2	15.0	60.4	14.2
Queue Length 50th (ft)	55	410	47	426	0	4	2	77	1
Queue Length 95th (ft)	m78	492	93	510	6	18	30	136	25
Internal Link Dist (ft)		844		641			474		441
Turn Bay Length (ft)			155		165	100		100	
Base Capacity (vph)	190	1501	169	1462	715	179	434	199	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.72	0.38	0.81	0.08	0.03	0.08	0.52	0.04

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues

6: Gateway Oaks Drive & West El Camino Avenue

08/03/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	862	223	245	575	102	387	60	371	450	117	288
v/c Ratio	0.16	0.72	0.42	0.50	0.59	0.19	0.65	0.09	0.72	0.71	0.16	0.53
Control Delay	35.8	34.2	7.7	40.1	32.1	4.9	39.8	30.2	19.7	40.2	29.2	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	34.2	7.7	40.1	32.1	4.9	39.8	30.2	19.7	40.2	29.2	9.0
Queue Length 50th (ft)	19	146	4	59	141	0	96	13	53	111	26	8
Queue Length 95th (ft)	50	237	64	122	243	30	175	33	167	197	54	75
Internal Link Dist (ft)		185			456			405			335	
Turn Bay Length (ft)	175		150	190		190	140		140	230		230
Base Capacity (vph)	531	1585	639	490	1130	589	739	1293	741	858	1411	793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.54	0.35	0.50	0.51	0.17	0.52	0.05	0.50	0.52	0.08	0.36

Intersection Summary

INTERSECTION ANALYSIS

BASELINE PLUS PROJECT WITH RECOMMENDATIONS CONDITIONS

AM PEAK HOUR

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/25/2020

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	260	1211	71	57	806	46	438	9	122	173	18	402
Future Volume (veh/h)	260	1211	71	57	806	46	438	9	122	173	18	402
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	260	1211	71	57	806	46	438	9	122	173	18	402
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	312	1333	594	99	882	393	500	11	154	522	485	411
Arrive On Green	0.18	0.38	0.38	0.06	0.25	0.25	0.14	0.10	0.10	0.29	0.26	0.26
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	110	1492	1781	1870	1585
Grp Volume(v), veh/h	260	1211	71	57	806	46	438	0	131	173	18	402
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1602	1781	1870	1585
Q Serve(g_s), s	16.9	38.8	3.5	3.7	26.5	2.7	14.9	0.0	9.6	9.1	0.9	19.4
Cycle Q Clear(g_c), s	16.9	38.8	3.5	3.7	26.5	2.7	14.9	0.0	9.6	9.1	0.9	19.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		1.00
Lane Grp Cap(c), veh/h	312	1333	594	99	882	393	500	0	166	522	485	411
V/C Ratio(X)	0.83	0.91	0.12	0.57	0.91	0.12	0.88	0.00	0.79	0.33	0.04	0.98
Avail Cap(c_a), veh/h	408	1522	679	99	906	404	541	0	367	522	485	411
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	1.00	1.00	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	35.6	24.5	55.3	43.9	34.9	50.2	0.0	52.5	33.2	33.2	18.2
Incr Delay (d2), s/veh	8.6	7.1	0.0	8.4	12.3	0.2	14.7	0.0	31.0	0.1	0.1	39.2
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	8.0	17.2	1.3	1.9	12.7	1.0	7.4	0.0	5.3	4.0	0.4	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	42.7	24.6	63.6	56.2	35.1	65.0	0.0	83.5	33.3	33.4	57.4
LnGrp LOS	E	D	C	E	E	D	E	A	F	C	C	E
Approach Vol, veh/h		1542			909			569			593	
Approach Delay, s/veh		44.2			55.6			69.2			49.6	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.6	17.8	11.2	50.4	21.9	36.5	26.4	35.2
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	14.6	* 28	6.7	51.4	18.8	23.3	27.5	* 31
Max Q Clear Time (g_c+I1), s	11.1	11.6	5.7	40.8	16.9	21.4	18.9	28.5
Green Ext Time (p_c), s	0.1	0.8	0.0	4.2	0.5	0.2	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	51.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
7: Orchard Lane & Orchard Court

08/25/2020

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰↱		↰	↑	↱	
Traffic Vol, veh/h	0	430	273	57	163	2
Future Vol, veh/h	0	430	273	57	163	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	430	273	57	163	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	767	164	165	0	-	0
Stage 1	164	-	-	-	-	-
Stage 2	603	-	-	-	-	-
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	370	881	1413	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	299	881	1413	-	-	-
Mov Cap-2 Maneuver	299	-	-	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	546	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	12.9		6.7		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1413	-	881	-	-
HCM Lane V/C Ratio	0.193	-	0.488	-	-
HCM Control Delay (s)	8.2	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	2.7	-	-

Intersection	
Int Delay, s/veh	8.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	⋎	
Traffic Vol, veh/h	54	4	217	58	4	376
Future Vol, veh/h	54	4	217	58	4	376
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	4	217	58	4	376

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	548	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	492	-
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	-	-	1546	-	497	1011
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	615	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	425	1011
Mov Cap-2 Maneuver	-	-	-	-	425	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	526	-

Approach	EB		WB		NB
HCM Control Delay, s	0		6.1		10.8
HCM LOS					B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	997	-	-	1546	-
HCM Lane V/C Ratio	0.381	-	-	0.14	-
HCM Control Delay (s)	10.8	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.5	-

Queues
1: West El Camino Avenue & Westbound I-80 Ramp

08/25/2020

	→	←	↘	↙
Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	468	311	765	96
v/c Ratio	0.65	0.43	0.90	0.06
Control Delay	19.7	15.4	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.7	15.4	29.5	0.1
Queue Length 50th (ft)	134	80	183	0
Queue Length 95th (ft)	208	129	#421	0
Internal Link Dist (ft)	294	252	765	
Turn Bay Length (ft)				800
Base Capacity (vph)	741	741	877	1583
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.42	0.87	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
2: Eastbound I-80 Ramp & West El Camino Avenue

08/25/2020

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1115	695	117	429
v/c Ratio	0.86	0.53	0.28	0.89
Control Delay	20.8	9.6	37.8	48.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.8	9.6	37.8	48.9
Queue Length 50th (ft)	622	246	64	188
Queue Length 95th (ft)	670	248	127	#425
Internal Link Dist (ft)	249	128	477	
Turn Bay Length (ft)				150
Base Capacity (vph)	1368	1373	413	483
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.51	0.28	0.89

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

3: Orchard Lane & West El Camino Avenue

08/25/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	260	1211	71	57	806	46	438	131	173	18	402
v/c Ratio	0.80	0.88	0.10	0.40	0.80	0.08	0.77	0.32	0.58	0.05	0.63
Control Delay	64.5	42.2	0.3	38.9	40.1	4.8	57.3	12.3	54.3	44.2	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	42.2	0.3	38.9	40.1	4.8	57.3	12.3	54.3	44.2	9.5
Queue Length 50th (ft)	195	448	0	42	344	2	165	6	127	12	0
Queue Length 95th (ft)	276	513	0	88	418	26	#245	66	192	34	96
Internal Link Dist (ft)		183			844			420		204	
Turn Bay Length (ft)	295		240	295		135	155		70		240
Base Capacity (vph)	405	1520	767	143	1021	571	584	485	296	422	669
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.80	0.09	0.40	0.79	0.08	0.75	0.27	0.58	0.04	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	1355	196	850	25	13	47	122	49
v/c Ratio	0.08	0.97	0.84	0.48	0.03	0.07	0.09	0.61	0.10
Control Delay	33.3	57.7	80.6	21.9	0.1	49.9	0.4	64.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	57.7	80.6	21.9	0.1	49.9	0.4	64.8	12.6
Queue Length 50th (ft)	9	570	149	189	0	9	0	91	2
Queue Length 95th (ft)	m13	#712	#271	326	0	30	0	#158	35
Internal Link Dist (ft)		844		641			474		441
Turn Bay Length (ft)			155		165	100		100	
Base Capacity (vph)	190	1391	243	1788	851	179	510	199	498
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.97	0.81	0.48	0.03	0.07	0.09	0.61	0.10

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Gateway Oaks Drive & West El Camino Avenue

08/25/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	324	767	445	351	602	574	220	117	127	130	34	44
v/c Ratio	0.58	0.62	0.62	0.62	0.69	0.70	0.30	0.18	0.32	0.25	0.05	0.12
Control Delay	36.2	29.4	6.9	36.5	31.6	7.4	31.1	29.2	8.5	32.5	29.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	29.4	6.9	36.5	31.6	7.4	31.1	29.2	8.5	32.5	29.4	0.6
Queue Length 50th (ft)	77	123	0	84	143	0	51	25	0	29	7	0
Queue Length 95th (ft)	129	168	69	135	196	77	90	52	46	59	21	0
Internal Link Dist (ft)		185			456			405			335	
Turn Bay Length (ft)	175		150	190		190	140		140	230		230
Base Capacity (vph)	562	2032	899	649	1512	1005	734	1392	699	519	1343	674
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.38	0.49	0.54	0.40	0.57	0.30	0.08	0.18	0.25	0.03	0.07

Intersection Summary

INTERSECTION ANALYSIS

BASELINE PLUS PROJECT WITH RECOMMENDATIONS CONDITIONS

PM PEAK HOUR

HCM 6th Signalized Intersection Summary
3: Orchard Lane & West El Camino Avenue

08/25/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰↰	↱		↰	↑	↱
Traffic Volume (veh/h)	265	884	285	114	1074	47	221	5	97	134	6	176
Future Volume (veh/h)	265	884	285	114	1074	47	221	5	97	134	6	176
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	265	884	285	114	1074	47	221	5	97	134	6	176
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	1476	658	144	1153	514	281	8	154	409	481	408
Arrive On Green	0.16	0.42	0.42	0.08	0.32	0.32	0.08	0.10	0.10	0.23	0.26	0.26
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	78	1519	1781	1870	1585
Grp Volume(v), veh/h	265	884	285	114	1074	47	221	0	102	134	6	176
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1597	1781	1870	1585
Q Serve(g_s), s	17.5	23.2	15.4	7.5	35.1	2.5	7.5	0.0	7.4	7.5	0.3	7.3
Cycle Q Clear(g_c), s	17.5	23.2	15.4	7.5	35.1	2.5	7.5	0.0	7.4	7.5	0.3	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	293	1476	658	144	1153	514	281	0	162	409	481	408
V/C Ratio(X)	0.91	0.60	0.43	0.79	0.93	0.09	0.79	0.00	0.63	0.33	0.01	0.43
Avail Cap(c_a), veh/h	379	1478	659	226	1173	523	343	0	309	409	481	408
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	1.00	1.00	0.40	0.40	0.40	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.2	27.3	25.0	54.1	39.2	28.2	54.1	0.0	51.7	38.5	33.2	16.1
Incr Delay (d2), s/veh	18.4	0.5	0.2	5.6	6.2	0.0	10.7	0.0	17.0	0.2	0.0	3.3
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	9.0	9.5	5.6	3.5	15.6	0.9	3.7	0.0	3.7	3.3	0.1	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.6	27.8	25.2	59.8	45.5	28.3	64.8	0.0	68.7	38.7	33.3	19.4
LnGrp LOS	E	C	C	E	D	C	E	A	E	D	C	B
Approach Vol, veh/h		1434			1235			323			316	
Approach Delay, s/veh		34.6			46.1			66.0			27.9	
Approach LOS		C			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.9	17.6	14.2	55.2	14.3	36.3	25.1	44.3
Change Period (Y+Rc), s	5.4	* 5.4	4.5	5.4	4.5	5.4	5.4	* 5.4
Max Green Setting (Gmax), s	11.9	* 23	15.2	49.9	11.9	23.2	25.5	* 40
Max Q Clear Time (g_c+I1), s	9.5	9.4	9.5	25.2	9.5	9.3	19.5	37.1
Green Ext Time (p_c), s	0.0	0.5	0.2	4.3	0.2	0.3	0.2	1.8

Intersection Summary			
HCM 6th Ctrl Delay			41.3
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
7: Orchard Lane & Orchard Court

08/25/2020

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		↰	↑	↱	
Traffic Vol, veh/h	1	51	192	197	64	2
Future Vol, veh/h	1	51	192	197	64	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	51	192	197	64	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	646	65	66	0	-	0
Stage 1	65	-	-	-	-	-
Stage 2	581	-	-	-	-	-
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	436	999	1536	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	382	999	1536	-	-	-
Mov Cap-2 Maneuver	382	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	559	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1536	-	969	-	-
HCM Lane V/C Ratio	0.125	-	0.054	-	-
HCM Control Delay (s)	7.7	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	-	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	47	2	138	56	2	203
Future Vol, veh/h	47	2	138	56	2	203
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	2	138	56	2	203

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	380	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	332	-
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	-	-	1558	-	622	1021
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1558	-	565	1021
Mov Cap-2 Maneuver	-	-	-	-	565	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	661	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		5.4		9.5	
HCM LOS					A	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1013	-	-	1558	-
HCM Lane V/C Ratio	0.202	-	-	0.089	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-

Queues

1: West El Camino Avenue & Westbound I-80 Ramp

	→	←	↘	↙
Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	294	932	454	152
v/c Ratio	0.31	0.98	0.73	0.10
Control Delay	10.4	44.0	21.9	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	44.0	21.9	0.1
Queue Length 50th (ft)	51	274	124	0
Queue Length 95th (ft)	118	#591	172	0
Internal Link Dist (ft)	294	252	765	
Turn Bay Length (ft)				800
Base Capacity (vph)	953	953	852	1583
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.98	0.53	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
2: Eastbound I-80 Ramp & West El Camino Avenue

08/25/2020

	→	←	↰	↱
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	674	747	646	759
v/c Ratio	0.75	0.82	0.82	0.96
Control Delay	30.2	34.4	36.1	46.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	34.4	36.1	46.5
Queue Length 50th (ft)	397	466	365	400
Queue Length 95th (ft)	549	#694	529	#678
Internal Link Dist (ft)	249	128	477	
Turn Bay Length (ft)				150
Base Capacity (vph)	905	910	831	828
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.82	0.78	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

3: Orchard Lane & West El Camino Avenue

	↗	→	↘	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	265	884	285	114	1074	47	221	102	134	6	176
v/c Ratio	0.84	0.59	0.34	0.56	0.83	0.07	0.64	0.29	0.63	0.02	0.40
Control Delay	70.1	28.0	3.6	26.4	36.0	2.0	60.7	13.4	62.9	43.8	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.1	28.0	3.6	26.4	36.0	2.0	60.7	13.4	62.9	43.8	9.4
Queue Length 50th (ft)	199	252	0	77	468	0	84	3	101	4	0
Queue Length 95th (ft)	288	341	51	m91	534	m0	128	57	161	17	63
Internal Link Dist (ft)		183			844			420		204	
Turn Bay Length (ft)	295		240	295		135	155		70		240
Base Capacity (vph)	376	1543	851	237	1296	681	356	424	214	410	485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.57	0.33	0.48	0.83	0.07	0.62	0.24	0.63	0.01	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

4: West River Drive/River Oaks Way & West El Camino Avenue

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	1074	64	1183	60	6	35	104	24
v/c Ratio	0.38	0.76	0.39	0.86	0.09	0.03	0.08	0.52	0.04
Control Delay	38.8	37.7	58.4	41.0	0.9	49.2	15.0	60.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	37.7	58.4	41.0	0.9	49.2	15.0	60.4	14.2
Queue Length 50th (ft)	54	410	47	426	0	4	2	77	1
Queue Length 95th (ft)	m78	492	93	510	6	18	30	136	25
Internal Link Dist (ft)		844		641			474		441
Turn Bay Length (ft)			155		165	100		100	
Base Capacity (vph)	190	1501	169	1462	715	179	434	199	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.72	0.38	0.81	0.08	0.03	0.08	0.52	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Gateway Oaks Drive & West El Camino Avenue

08/25/2020

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	862	223	245	575	102	387	60	371	450	117	288
v/c Ratio	0.16	0.72	0.42	0.50	0.59	0.19	0.65	0.09	0.72	0.71	0.16	0.53
Control Delay	35.8	34.2	7.7	40.1	32.1	4.9	39.8	30.2	19.7	40.2	29.2	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	34.2	7.7	40.1	32.1	4.9	39.8	30.2	19.7	40.2	29.2	9.0
Queue Length 50th (ft)	19	146	4	59	141	0	96	13	53	111	26	8
Queue Length 95th (ft)	50	237	64	122	243	30	175	33	167	197	54	75
Internal Link Dist (ft)		185			456			405			335	
Turn Bay Length (ft)	175		150	190		190	140		140	230		230
Base Capacity (vph)	531	1585	639	490	1130	589	739	1293	741	858	1411	793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.54	0.35	0.50	0.51	0.17	0.52	0.05	0.50	0.52	0.08	0.36

Intersection Summary