

TECHNICAL MEMORANDUM

Missouri Flat Master Circulation & Financing Plan Phase II

DRAFT Technical Memorandum 1-8

Missouri Flat Road Interchange Capacity Threshold Phasing Analysis and Alternative Screening Evaluation

Date: January 9, 2018 Project #: 18048
To: Ms. Natalie Porter and Ms. Katie Jackson, El Dorado County
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CC:

This initial draft memorandum summarizes the following subtasks for the Missouri Flat Master Circulation and Financing Plan Phase II (MC&FP-II) project:

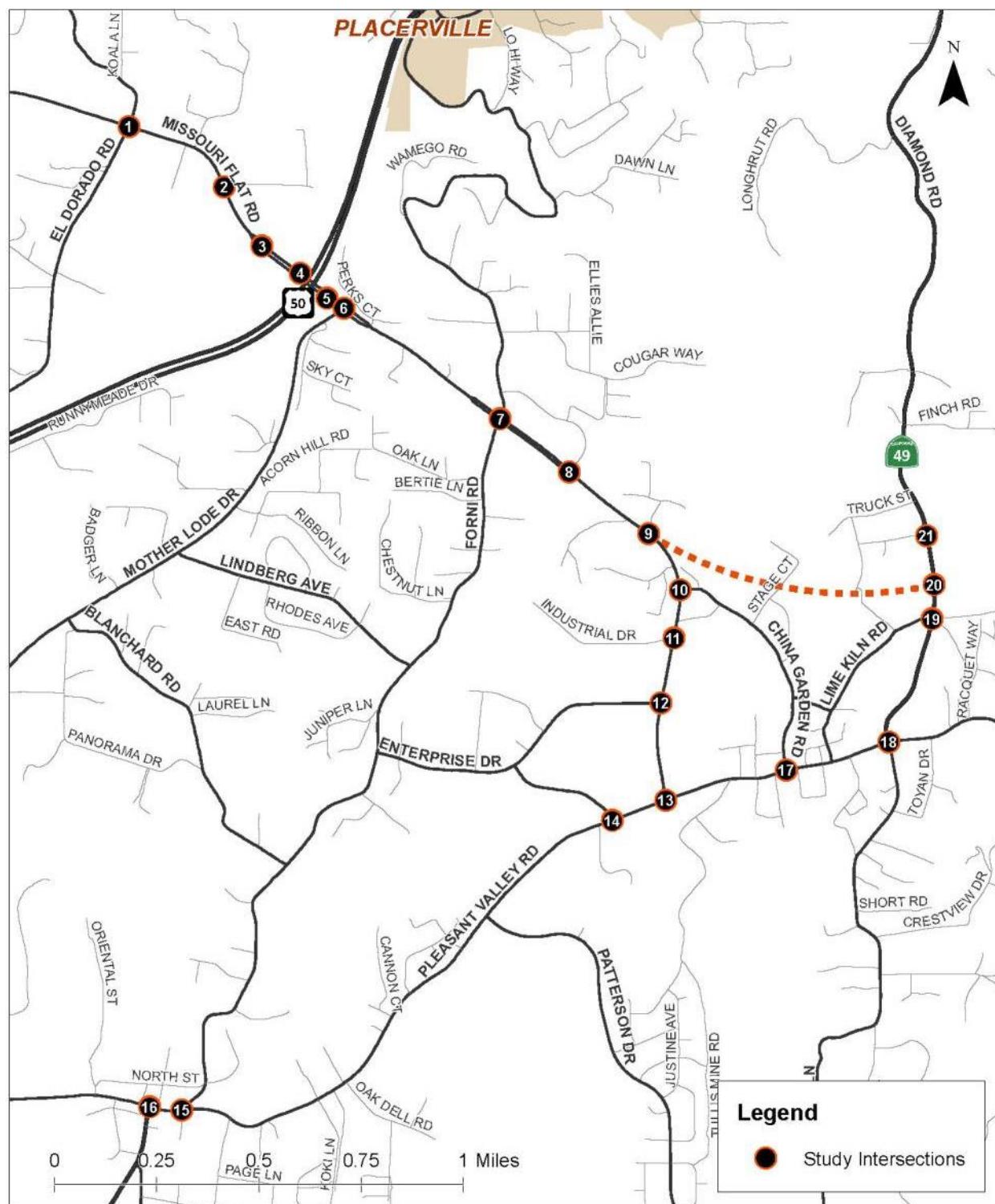
- Subtask 1.4.5: Future Traffic Conditions, Deficiencies and Needed Improvements
- Subtask 1.4.6: Missouri Flat Interchange Focused Analysis

The study area includes 23 study intersections, with a focus on the operations of the US 50 freeway interchange at Missouri Flat Road (Figure 1).

SUMMARY

- With projected 2035 volumes, level of service (LOS) F conditions are projected at seven of the 23 study intersections.
- At the US 50/Missouri Flat Road interchange, signal phasing and timing modifications may provide for LOS D or better operations at all intersections without physical improvements for the year 2035, but not with 2040 volumes.
- Several ultimate interchange configurations could provide LOS D or better operations at all interchange intersections, including a hook ramp concept, a partial cloverleaf concept, a six-lane tight diamond or a single point diamond concept.
- A diverging diamond interchange would provide LOS C or better operations but would be most effective with the relocation of the Mother Lode Drive intersection at Missouri Flat Road. It could operate with right-turn only access at Mother Lode Drive.
- An interchange based on roundabout intersections at the ramps cannot provide the capacity required for the 2040 volumes.

Figure 1: Study Area



Note: The intersections of US 50 EB Ramps/El Dorado Road and US 50 WB Ramps/El Dorado Road are included in the analysis, but not shown on this figure.

FUTURE TRAFFIC CONDITIONS

The future traffic conditions for all study locations were evaluated to identify potential deficiencies and recommended improvements.

LOS is a grading system that indicates the quality of service motorists experience on roadway facilities such as intersections or along roadway segments. LOS is a qualitative measure of the effect of a number of factors, including delay, vehicle speeds and travel time, traffic interruptions, freedom to maneuver, driving comfort and convenience. Levels of Service are designated "A" through "F", which cover the entire range of traffic operations that might occur. LOS A reflects little to no delay from the motorists' perspective, while LOS F indicates significant delays and queuing. Level of Service (LOS) "A" through "E" generally represents traffic volumes less than or at roadway capacity, while LOS "F" represents over capacity and/or forced flow conditions.

El Dorado County General Plan Policy TC-Xd provides level of service standards as follows:

Level of Service (LOS) for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2. The volume to capacity [V/C] ratio of the roadway segments listed in Table TC-2 shall not exceed the ratio specified in that table.

All of the study intersections are located within the El Dorado/Diamond Springs Community Region. As such, the intersections will be evaluated against LOS E standard. Two segments listed in the Table TC-2 are included in the study area:

1. Missouri Flat Road - US 50 to Mother Lode Drive (Maximum V/C Ratio = 1.12)
2. Missouri Flat Road - Mother Lode Drive to China Garden Road (Maximum V/C Ratio = 1.20)

Operational Assessment

Traffic operations for all study intersections were evaluated using *Highway Capacity Manual* (HCM) methodologies and the Synchro software network set up initially for the Diamond Springs Parkway Transportation Analysis Report (TAR) (Table 1). As described in Technical Memorandum 1-7, the future year operational analysis assumes the construction of Diamond Springs Parkway as a four-lane roadway. The analysis also assumes the widening of Missouri Flat Road from two to four lanes between China Garden Road and State Route (SR) 49 (Pleasant Valley Road). The analysis results do not assume any improvements to the Missouri Flat Road and El Dorado Road interchanges.

Table 1: Intersection Operations

ID	Intersection	Control	Peak	Existing		2035	
				Delay ^{1,2}	LOS ²	Delay ^{1,2}	LOS ²
1	Missouri Flat Rd. & El Dorado Rd.	Signal	AM	19.9	B	16.7	B
			PM	14.7	B	16.1	B
2	Missouri Flat Rd. & Headington Rd.	SSSC	AM	13.7	B	29.3	C
			PM	12.1	B	34.3	C
3	Missouri Flat Rd. & Plaza Dr.*	Signal	AM	28.6	C	41.4	D
			PM	38.7	D		
4	Missouri Flat Rd. & US 50 WB Ramps*	Signal	AM	31.8	C	25.9	C
			PM	28	C		
5	Missouri Flat Rd. & US 50 EB Ramps*	Signal	AM	18.1	B	248.8	F
			PM	23.3	C		
6	Missouri Flat Rd. & Mother Lode Dr.*	Signal	AM	11.4	B	21.8	C
			PM	13.2	B		
7	Missouri Flat Rd. & Forni Rd.	Signal	AM	26	C	23.1	C
			PM	28.3	C	29.4	C
8	Missouri Flat Rd. & Golden Center Dr.	Signal	AM	10.2	B	12.9	B
			PM	16.2	B	24.6	C
9	Missouri Flat Rd. & Diamond Springs Pkwy.	Future Signal	AM	N/A	N/A	28	C
			PM	N/A	N/A	22.9	C
10	Missouri Flat Rd. & China Garden Rd.	SSSC	AM	154.9	F	22.9	C
			PM	116.4	F	29.1	D
11	Missouri Flat Rd. & Industrial Dr.	SSSC	AM	15.9	C	17.4	C
			PM	21.8	C	223.6	F
12	Missouri Flat Rd. & Enterprise Dr.	SSSC	AM	23.2	C	24.6	C
			PM	30.8	D	59.6	F
13	Missouri Flat Rd. & Pleasant Valley Rd. (SR 49)	Signal	AM	14.2	B	14.2	B
			PM	28.6	C	23.3	C
14	Pleasant Valley Rd. (SR 49) & Commerce Way	SSSC	AM	14.9	B	14.2	B
			PM	15.9	C	16.7	C
15	Pleasant Valley Rd. (SR 49) & Forni Rd.	SSSC	AM	36.2	E	107.2	F
			PM	14.8	B	20.3	C

Table 1: Intersection Operations

ID	Intersection	Control	Peak	Existing		2035	
				Delay ^{1,2}	LOS ²	Delay ^{1,2}	LOS ²
16	Pleasant Valley Rd. & SR 49 (West)	AWSC	AM	47.3	E	57	F
			PM	20.7	C	74.9	F
17	Pleasant Valley Rd. (SR 49) & China Garden Rd.	SSSC	AM	20.9	C	17.7	C
			PM	25.6	D	24.9	C
18	Pleasant Valley Rd (SR 49) & Diamond Rd/Fowler Ln.	Signal	AM	28.2	C	22.8	C
			PM	23.1	C	28	C
19	Diamond Rd. & Black Rice Ln./Lime Kiln Rd.	SSSC	AM	13.1	B	13.2	B
			PM	21.8	C	14.1	B
20	Diamond Rd. & Diamond Springs Pkwy.	Future Signal	AM	N/A	N/A	29.6	C
			PM	N/A	N/A	47.9	D
21	Diamond Rd. & Bradley Dr.	SSSC	AM	11.1	B	15.7	C
			PM	13.1	B	31.9	D
22	El Dorado Rd. & US 50 WB Ramps	SSSC	AM	21.5	C	37.6	E
			PM	17	C	78.6	F
23	El Dorado Rd. & US 50 EB Ramps	SSSC	AM	15.6	C	32.1	D
			PM	15.5	C	86.3	F
Notes: Source: Kittelson & Associates, 2016 SSSC = Side Street Stop Control, AWSC = All Way Stop Control, N/A = not applicable for this scenario Bold and shaded cells indicate that delays and LOS exceed the County or State's operational threshold * Analyzed using SimTraffic micro-simulation models. PM peak hour LOS and delay are reported from the focused analysis described in the following section. 1 Delay is reported in seconds / vehicles, based on HCM 2010 methods 2 Worse movement delay and LOS reported for SSSC. For AWSC and signal, overall average delay and LOS is reported.							

Deficient operations (LOS F) are projected at the intersections of

- Missouri Flat Road & US 50 Eastbound Ramps
- Missouri Flat Road & Industrial Drive
- Missouri Flat Road & Enterprise Drive
- Pleasant Valley Road (SR 49) & Forni Road
- Pleasant Valley Road & SR 49 (West)
- El Dorado Road & US 50 WB Ramps
- El Dorado Road & US 50 EB Ramps

MISSOURI FLAT ROAD INTERCHANGE FOCUSED ANALYSIS

Traffic operations for the four interchange area intersections (Missouri Flat Road from Plaza Drive to Mother Lode Drive) were further evaluated using traffic simulation and the SimTraffic software. This provides a more complete analysis of the effects of queues and interactions between the closely spaced intersections. The driver behavior assumptions were adjusted consistent with the calibration reported for the Diamond Springs Parkway TAR. Following standard practice, each scenario was simulated for one-hour ten times and the average of the results of the ten simulations were reported.

This screening analysis of the interchange alternatives focuses on the PM peak hour, which has higher traffic volumes than the AM peak hour. Further design of a preferred interchange alternative will evaluate both AM and PM peak hour operations.

The interchange was first evaluated using the existing signal timing settings (Table 2). With the updated 2035 forecasts, the simulation results in LOS C operations at three of the four intersections and LOS F at the intersection of US 50 eastbound ramps and Missouri Flat Road. With the 2040 forecasts, the intersection of Plaza Drive and Missouri Flat Road changes from LOS C (2035) to LOS D while the other intersections remain at the same LOS. The 2040 forecasts from the DSP TAR reflect similar deficiencies, but also result in LOS F at Mother Lode Drive. The deficient operations are primarily caused by the close spacing between the eastbound ramp intersection and the Mother Lode Drive intersection.

Modified Signal Phasing

Several adjustments in signal phasing and timing were tested to identify the potential for interim improvements in traffic operations prior to a major capital investment. The most successful was to modify the phasing at the eastbound ramp intersection to allow right turns from the off-ramp to overlap with southbound left-turns to the on-ramp (Figure 2). With this modification, the analysis indicates that LOS D or better operations could be provided at all four study intersections with the updated 2035 traffic forecasts but not with the 2040 forecasts where Plaza Drive and US 50 eastbound ramps operate at LOS F and LOS E, respectively.

Mother Lode Drive Relocation

The close spacing between the eastbound off-ramp intersection and the Mother Lode Drive intersection is identified as the primary cause of deficient operations with the 2040 forecast volumes. The traffic operations were evaluated assuming that Mother Lode Drive could be relocated to an intersection further south along Missouri Flat Road. The initial analysis indicates that LOS D or better operations could be provided with a relocated Mother Lode Drive intersection in 2035 and LOS E or better in 2040.

Table 2: US 50/Missouri Flat Road Interchange PM Peak Hour Intersection Operations

2035 MC&FP Traffic Forecast

No.	Intersection	Existing Signal Phasing	Modified Signal Phasing	Modified Signal + Mother Lode Relocation
3	Missouri Flat Rd. & Plaza Dr.	C (33.8)	D (37.0)	C (32.0)
4	Missouri Flat Rd. & US 50 WB Ramps	C (22.8)	C (28.1)	C (23.2)
5	Missouri Flat Rd. & US 50 EB Ramps	F (236.3)	C (27.3)	C (34.5)
6	Missouri Flat Rd. & Mother Lode Dr.	C (22.7)	B (11.8)	D (38.4)

2040 MC&FP Traffic Forecast

No.	Intersection	Existing Signal Phasing	Modified Signal Phasing	Modified Signal + Mother Lode Relocation
3	Missouri Flat Rd. & Plaza Dr.	D (41.4)	F (84.0)	E (56.3)
4	Missouri Flat Rd. & US 50 WB Ramps	C (25.6)	D (35.6)	C (32.7)
5	Missouri Flat Rd. & US 50 EB Ramps	F (248.8)	E (57.4)	D (37.1)
6	Missouri Flat Rd. & Mother Lode Dr.	C (21.8)	B (17.7)	C (33.8)

2040 Diamond Springs Parkway TAR Traffic Forecast

No.	Intersection	Existing Signal Phasing	Modified Signal Phasing	Modified Signal + Mother Lode Relocation
3	Missouri Flat Rd. & Plaza Dr.	D (42.7)	E (59.6)	D (39.8)
4	Missouri Flat Rd. & US 50 WB Ramps	C (30.1)	D (37.9)	C (28.8)
5	Missouri Flat Rd. & US 50 EB Ramps	F (349.4)	C (32.5)	C (35.0)
6	Missouri Flat Rd. & Mother Lode Dr.	F (89.1)	C (25.8)	C (27.2)

Notes:

C (32.8) = Level of service (average vehicle delay in seconds).

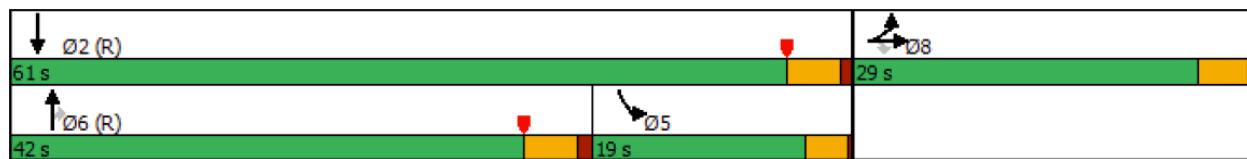
Results based on average of 10 random simulations using SimTraffic software.

Bold and shaded cells indicate that delays and LOS exceed the County or State's operational threshold.

Figure 2: Missouri Flat Road Interchange Recommended Signal Phasing Modification



Existing Phasing at US 50 EB Ramps/Missouri Flat Road



Modified Phasing at US 50 EB Ramps/Missouri Flat Road



ALTERNATIVE SCREENING EVALUATION

Traffic operations were evaluated for several interim and ultimate interchange configurations:

Interim Configurations

- Lane Reconfiguration 1
- Lane Reconfiguration 2

Ultimate Configurations

- Hook Ramps (no Mother Lode Drive relocation)
- Partial Cloverleaf (with Mother Lode Drive relocation)
- Diverging Diamond (no Mother Lode Drive relocation, access restrictions)
- Diverging Diamond (with Mother Lode Drive relocation)
- Roundabouts (no Mother Lode Drive relocation)
- 6-Lane Tight Diamond (no Mother Lode Drive relocation)
- Single Point Diamond (no Mother Lode Drive relocation)

Lane Reconfiguration 1

Lane reconfiguration 1 restripes the existing bridge and approaches without structural modifications to get more capacity from the existing interchange. The reconfiguration primarily adds an additional through lane on Missouri Flat Road starting at the northbound approach to Mother Lode Drive and ending at the northbound left turn lane into Plaza Drive. This configuration would provide additional northbound through capacity for the interchange.

The simulation analysis indicates that the interchange would continue to operate similarly (Table 3) to conditions without modifications. This is due to the additional northbound lane not addressing the close intersection spacing of the eastbound US 50 off-ramp and Mother Lode Drive which is the primary deficiency with the interchange under 2040 conditions.

Figure 3: Lane Reconfiguration 1 Concept Sketch



Table 3: 2040 PM Peak Hour Traffic Operations with Lane Reconfiguration 1

No.	Intersection	LOS(Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (43.9)
4	Missouri Flat Rd. & US 50 WB Ramps	C (25.8)
5	Missouri Flat Rd. & US 50 EB Ramps	F (233.2)
6	Missouri Flat Rd. & Mother Lode Dr.	C (22.1)

Lane Reconfiguration 2

Like lane reconfiguration 1, lane configuration 2 modifications would primarily involve restriping to increase capacity of certain movements. The reconfiguration would extend the southbound left turn lanes at the eastbound ramps onto the freeway to be the entire length of the bridge for better queue storage and an additional through lane on the northbound approaches to Mother Lode Drive and US 50 eastbound ramps.

Lane reconfiguration 2 was found to operate slightly better than lane reconfiguration 1 (Table 4) but it is still similar to operations for the unmodified interchange.

Figure 4: Lane Reconfiguration 2 Concept Sketch



Table 4: 2040 PM Peak Hour Traffic Operations with Lane Reconfiguration 2

No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (39.2)
4	Missouri Flat Rd. & US 50 WB Ramps	C (25.2)
5	Missouri Flat Rd. & US 50 EB Ramps	F (229.1)
6	Missouri Flat Rd. & Mother Lode Dr.	B (14.1)

Hook Ramps

The hook ramp concept would replace the eastbound US 50 off-ramp to Missouri Flat Road with hook on- and off-ramps connecting to Mother Lode Drive (Figure 5). The intersection of Mother Lode Drive and the new hook ramps would be signalized and operate in coordination with the signal at Mother Lode Drive and Missouri Flat Road.

Figure 5: Hook Ramp Concept Sketch



The existing eastbound US 50 on-ramp from Missouri Flat Road would continue to serve vehicles traveling northbound on Missouri Flat Road. However, vehicles on southbound Missouri Flat Road would turn right on Mother Lode Drive and then turn right to a new hook on-ramp to travel east on US 50. This configuration would eliminate the existing signalized intersection at the eastbound ramps, and would allow Mother Lode Drive to remain in its current alignment.

The simulation analysis indicates that LOS D or better operations could be provided at all intersections, including the new intersection where the hook ramps would intersect Mother Lode Drive (Table 5).

Table 5: 2040 PM Peak Hour Traffic Operations with Hook Ramps

No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (41.8)
4	Missouri Flat Rd. & US 50 WB Ramps	C (30.3)
5	Mother Lode Dr. & US 50 EB Ramps	B (12.4)
6	Missouri Flat Rd. & Mother Lode Dr.	B (18.5)

Operational concerns with the hook ramps concept would include the following:

- Driver disorientation exiting to a frontage road rather than Missouri Flat Road, the primary arterial.

- Safety and visibility with the sharp right-turn on the off-ramp.
- This alternative has shorter ramps than exist today. Because shorter ramps have less storage space for queues, queuing on the off-ramp may affect freeway mainline traffic under very high traffic demand periods.
- Design and operations of the merge area on eastbound US 50 between the hook on-ramp and the existing on-ramp.

An initial queuing analysis for the hook off-ramp indicated that 95th percentile queues could be accommodated within the available storage distance without backing up to the freeway mainline.

Partial Cloverleaf

The partial cloverleaf accomplishes the same operational benefits as the hook ramp concept, but uses a standard Caltrans design (Figure 6). In order to provide the correct ramp geometry, this concept requires Mother Lode Drive to be relocated away from the interchange area.

The simulation analysis indicates that LOS D or better operations could be provided at all intersections (Table 6).

Figure 6: Partial Cloverleaf Concept Sketch



Table 6: 2040 PM Peak Hour Traffic Operations with Partial Cloverleaf

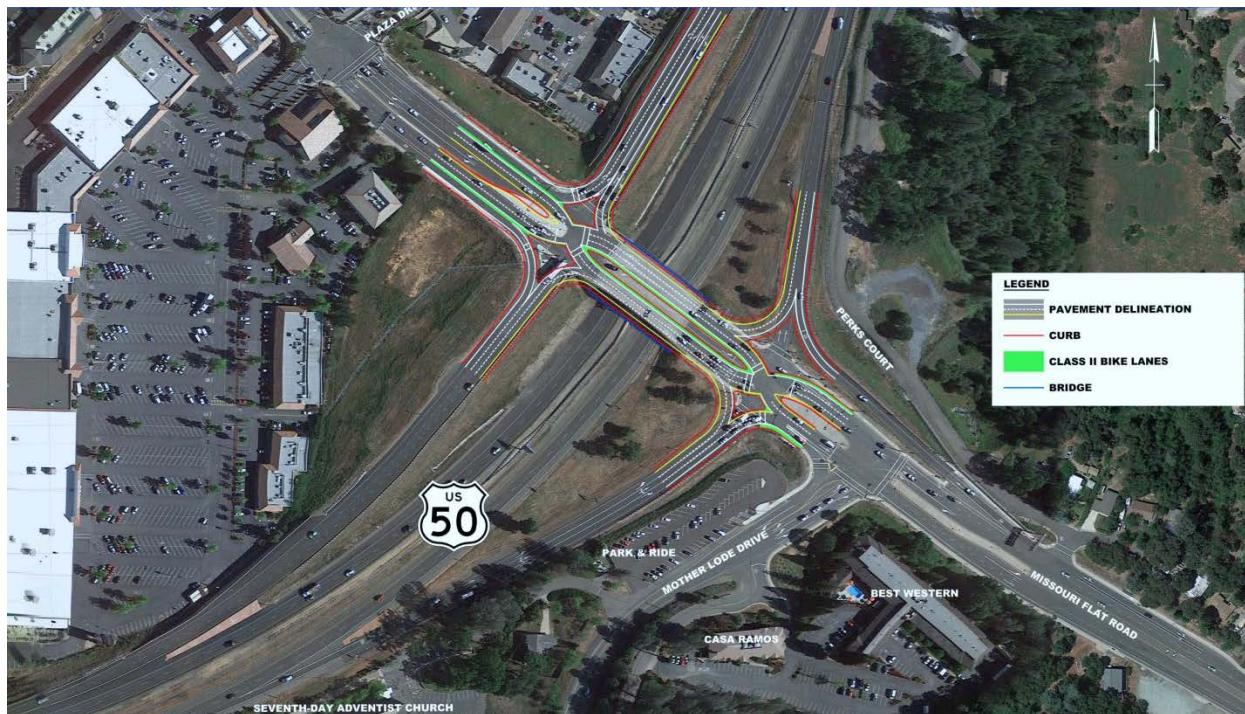
No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (36.1)
4	Missouri Flat Rd. & US 50 WB Ramps	C (25.9)
5	Missouri Flat Rd. & US 50 EB Ramps	C (22.0)
6	Missouri Flat Rd. & Mother Lode Dr.	C (22.2)

The operational concerns involved with the hook ramps concept would not apply to the partial cloverleaf concept. However, there would be additional costs associated with the relocation of Mother Lode Drive.

Diverging Diamond

The diverging diamond concept would construct two crossover intersections, so that traffic would drive on the left side of the road across the overpass (Figure 7). This design simplifies the movements that typically involve left-turns across traffic to access freeway on-ramps.

Figure 7: Diverging Diamond Concept Sketch



A traffic simulation was prepared for the diverging diamond, assuming that Mother Lode Drive remains in its current location. The initial results showed that LOS C or better operations could be provided at all intersections (Table 7). However, these results require three through lanes in each

direction through both crossover intersections rather than the two lanes shown southbound in the initial concept sketch.

Table 7: 2040 PM Peak Hour Traffic Operations with Diverging Diamond

No.	Intersection	(LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	C (27.3)
4	Missouri Flat Rd. & US 50 WB Ramps	B (15.6)
5	Missouri Flat Rd. & US 50 EB Ramps	B (11.6)
6	Missouri Flat Rd. & Mother Lode Dr.	A (5.2)

While the diverging diamond appears to be operationally feasible, diverging diamond interchanges often require a larger footprint than the tight diamond interchange that exists today at Missouri Flat Road. This extra space is generally needed to accommodate the roadway curvature required to transition vehicles from driving on the right side of the road to the left side of the road through the interchange. A structure width of 122 feet is recommended to provide all movements and allow for truck clearances through curves.

The initial traffic simulation indicates that full access could be provided at the Mother Lode intersection. However, further evaluation indicates that there would be significant traffic congestion if there are any surges of traffic flow, if the crosswalk across Missouri Flat Road at Mother Lode Drive is regularly activated, or if there is any breakdown of vehicle detector equipment. Because of the unreliability of the traffic operations with the Mother Lode Drive intersection, the diverging diamond can only be recommended if movements at Mother Lode Drive are restricted to right-in/right-out (with no signal or crosswalk) or if Mother Lode Drive is relocated further to the south.

Diverging Diamond with Relocation of Mother Lode Drive

Another variation of the diverging diamond concept would move Mother Lode Drive in addition to constructing a diverging diamond interchange. This would help reduce the potential for queues from the Mother Lode Drive intersection from interfering with operations at the diverging diamond interchange. However, there is still the potential for queues from the Plaza Drive intersection interfering with the diverging diamond operations.

A traffic simulation was prepared for the diverging diamond with the relocation of Mother Lode Drive. The initial results showed that the operations were similar to the diverging diamond without Mother Lode Drive's relocation (Table 8).

Table 8: 2040 PM Peak Hour Traffic Operations with Diverging Diamond and Mother Lode Drive Relocation

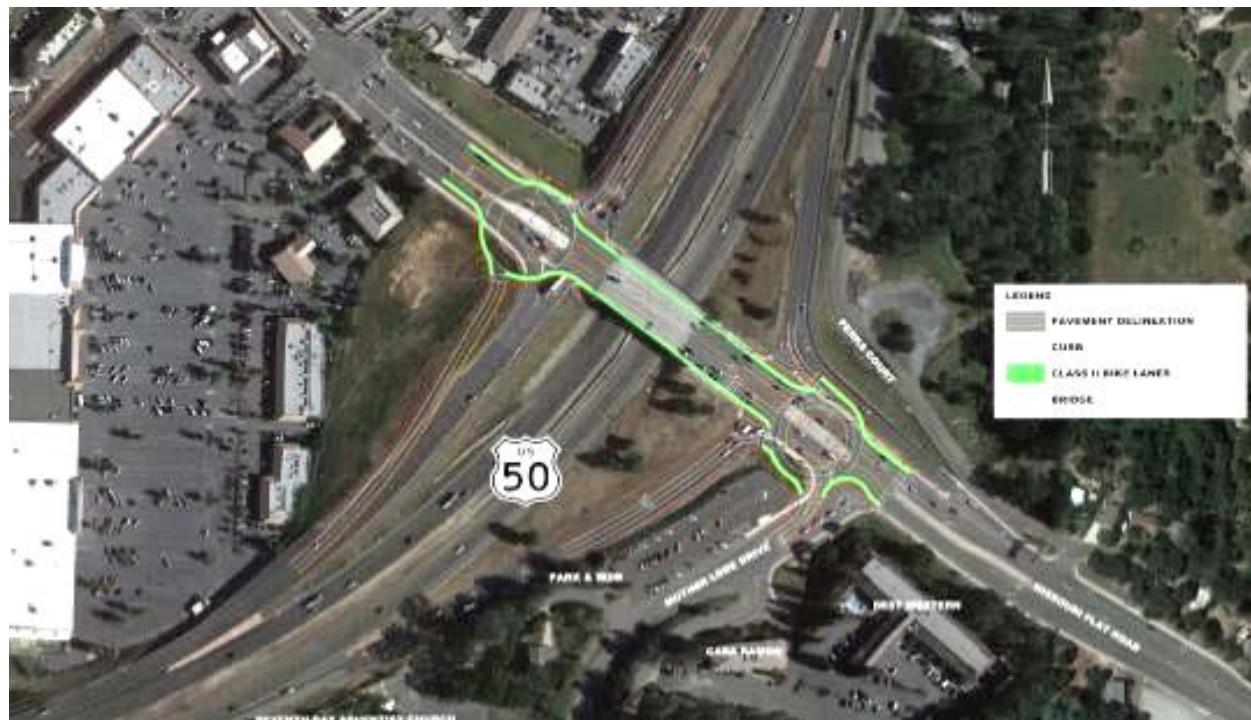
No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	C (27.3)
4	Missouri Flat Rd. & US 50 WB Ramps	B (15.6)
5	Missouri Flat Rd. & US 50 EB Ramps	B (11.6)
6	Missouri Flat Rd. & Mother Lode Dr.	A (5.2)

Given the operations are similar with or without the relocation of Mother Lode Drive, the need for relocation will be driven by the geometric needs of the diverging diamond interchange rather than the operations. Diverging diamond interchanges are often much longer than traditional tight diamond configurations to geometrically accommodate the required roadway horizontal curves.

Roundabout

The roundabout concept would replace the signalized ramp intersections with roundabouts (Figure 8). Mother Lode Drive is assumed to remain in place for this alternative.

Figure 8: Roundabout Concept Sketch



Prior to traffic simulation analysis, a screening evaluation of vehicle volumes and lane requirements was conducted using procedures described in *Roundabouts: An Informational Guide – Second Edition* (2017). Roundabout designs involving up to three lanes were tested. It was determined that the projected 2040 peak hour volumes would exceed the potential capacity of a multi-lane roundabout at this interchange. Therefore, the roundabout concept is not recommended for further evaluation.

Six Lane Tight Diamond

The six-lane tight diamond would use the existing structure but provide three through lanes in each direction across the bridge. A traffic simulation analysis indicates that the six-lane tight diamond interchange could provide LOS D or better operations at the intersections (Table 9).

Table 9: 2040 PM Peak Hour Traffic Operations with Six Lane Tight Diamond

No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (41.5)
4	Missouri Flat Rd. & US 50 WB Ramps	B (19.6)
5	Missouri Flat Rd. & US 50 EB Ramps	D (44.2)
6	Missouri Flat Rd. & Mother Lode Dr.	C (21.5)

Single Point Diamond

The single point diamond concept would replace the two ramp intersections at each end of the overpass with a single ramp intersection in the center of the overpass (Figure 9). This configuration eliminates several conflicting traffic movements, and also increases the spacing between the ramp intersection and the frontage road intersections. The single-point diamond interchange design was the preferred ultimate configuration resulting from the US 50/Missouri Flat Road Project Study Report and Project Report (PSR/PR) process.

A traffic simulation analysis indicates that the single point diamond interchange could provide LOS D or better operations at the intersections (Table 10). The operations of the ramp intersection are affected somewhat by the large size of the intersection, which requires additional time for vehicles to clear the intersection before the signal indication can change.

Figure 9: Single Point Diamond Concept Sketch



Table 10: 2040 PM Peak Hour Traffic Operations with Single Point Diamond

No.	Intersection	LOS (Delay)
3	Missouri Flat Rd. & Plaza Dr.	D (37.3)
4	Missouri Flat Rd. & US 50 Ramps	D (44.9)
6	Missouri Flat Rd. & Mother Lode Dr.	B (15.8)

CONCLUSIONS

All the proposed interchange concepts except the roundabout concept could provide LOS D or better operations with projected 2040 peak hour volumes. The hook ramps concept has several operational and design issues that would need to be resolved. The partial cloverleaf concept would require the additional cost of Mother Lode Drive relocation, while the single point diamond concept would require the additional cost of expanding the structure over the freeway to accommodate the large intersection footprint. The diverging diamond concept is promising based on the operations analysis, however, the geometric footprint required to construct it is being finalized which may require relocation of the nearby intersections or widening of the bridge structure to accommodate vehicles transitioning from driving on the right side of the road to the left.

APPENDIX A: EXISTING AND 2035 HIGHWAY CAPACITY MANUAL OUTPUTS

HCM Signalized Intersection Capacity Analysis

1: El Dorado Rd & Missouri Flat Rd

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑			↔			↔	
Traffic Volume (vph)	3	257	60	16	445	43	132	19	22	50	27	4
Future Volume (vph)	3	257	60	16	445	43	132	19	22	50	27	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0				3.5		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00				1.00		1.00	
Frt	1.00	0.97		1.00	0.99				0.98		0.99	
Flt Protected	0.95	1.00		0.95	1.00				0.96		0.97	
Satd. Flow (prot)	1752	1792		1752	1820				1747		1777	
Flt Permitted	0.95	1.00		0.95	1.00				0.73		0.77	
Satd. Flow (perm)	1752	1792		1752	1820				1317		1412	
Peak-hour factor, PHF	0.79	0.79	0.79	0.73	0.73	0.73	0.70	0.70	0.70	0.70	0.70	0.70
Adj. Flow (vph)	4	325	76	22	610	59	189	27	31	71	39	6
RTOR Reduction (vph)	0	9	0	0	3	0	0	5	0	0	2	0
Lane Group Flow (vph)	4	392	0	22	666	0	0	242	0	0	114	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases								4			8	
Actuated Green, G (s)	1.0	30.0		1.3	30.3			23.3			23.3	
Effective Green, g (s)	1.0	30.0		1.3	30.3			23.3			23.3	
Actuated g/C Ratio	0.01	0.45		0.02	0.45			0.35			0.35	
Clearance Time (s)	4.0	5.0		4.0	5.0			3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.0			3.0	
Lane Grp Cap (vph)	26	801		33	821			457			490	
v/s Ratio Prot	0.00	0.22		c0.01	c0.37							
v/s Ratio Perm								c0.18			0.08	
v/c Ratio	0.15	0.49		0.67	0.81			0.53			0.23	
Uniform Delay, d1	32.6	13.1		32.7	15.9			17.5			15.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.0	0.3		37.4	6.0			4.3			1.1	
Delay (s)	34.6	13.5		70.1	21.9			21.8			16.7	
Level of Service	C	B		E	C			C			B	
Approach Delay (s)		13.7			23.4			21.8			16.7	
Approach LOS		B			C			C			B	
Intersection Summary												
HCM 2000 Control Delay		19.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		67.1			Sum of lost time (s)			12.5				
Intersection Capacity Utilization		46.0%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Headington Rd & Missouri Flat Rd

01/03/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↗ ↖ ↘ ↗					
Traffic Volume (veh/h)	15	36	457	21	41	293
Future Volume (Veh/h)	15	36	457	21	41	293
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.71	0.71	0.80	0.80
Hourly flow rate (vph)	18	42	644	30	51	366
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1127	659		674		
vC1, stage 1 conf vol	659					
vC2, stage 2 conf vol	468					
vCu, unblocked vol	1127	659		674		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	96	91		94		
cM capacity (veh/h)	425	462		912		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	18	42	674	51	366	
Volume Left	18	0	0	51	0	
Volume Right	0	42	30	0	0	
cSH	425	462	1700	912	1700	
Volume to Capacity	0.04	0.09	0.40	0.06	0.22	
Queue Length 95th (ft)	3	7	0	4	0	
Control Delay (s)	13.8	13.6	0.0	9.2	0.0	
Lane LOS	B	B		A		
Approach Delay (s)	13.7		0.0	1.1		
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		42.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

3: Missouri Flat Rd & Plaza Dr

01/03/2018

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	7	83	228	23	50	101	411	294	34	288	7
Future Volume (vph)	7	7	83	228	23	50	101	411	294	34	288	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor	0.95	0.95	0.95	0.95			0.97	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Fr _t	0.89	0.85	1.00	0.95			1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.99	1.00	0.95	0.98			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1570	1504	1665	1613			3433	3471	1563	1770	3427	
Flt Permitted	0.99	1.00	0.95	0.98			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1570	1504	1665	1613			3433	3471	1563	1770	3427	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	8	92	253	26	56	112	457	327	38	320	8
RTOR Reduction (vph)	0	36	49	0	22	0	0	0	138	0	1	0
Lane Group Flow (vph)	0	19	4	170	143	0	112	457	189	38	327	0
Confl. Bikes (#/hr)									3		3	
Heavy Vehicles (%)	2%	2%	2%	3%	9%	2%	2%	4%	2%	2%	5%	2%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7					6				
Actuated Green, G (s)	6.6	6.6	14.1	14.1			19.4	54.8	54.8	4.6	40.0	
Effective Green, g (s)	6.6	6.6	14.1	14.1			19.4	54.8	54.8	4.6	40.0	
Actuated g/C Ratio	0.07	0.07	0.15	0.15			0.20	0.58	0.58	0.05	0.42	
Clearance Time (s)	3.5	3.5	3.5	3.5			3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	109	104	247	239			701	2002	901	85	1442	
v/s Ratio Prot	c0.01		c0.10	0.09			0.03	c0.13		c0.02	c0.10	
v/s Ratio Perm			0.00						0.12			
v/c Ratio	0.17	0.04	0.69	0.60			0.16	0.23	0.21	0.45	0.23	
Uniform Delay, d1	41.6	41.2	38.4	37.8			31.1	9.8	9.7	44.0	17.6	
Progression Factor	1.00	1.00	1.00	1.00			1.18	1.42	3.71	1.00	1.00	
Incremental Delay, d2	0.3	0.1	6.2	2.7			0.0	0.3	0.5	1.4	0.4	
Delay (s)	41.9	41.3	44.6	40.5			36.8	14.1	36.4	45.3	18.0	
Level of Service	D	D	D	D			D	B	D	D	B	
Approach Delay (s)	41.6				42.6				25.1		20.8	
Approach LOS	D				D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.6				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			95.0				Sum of lost time (s)		14.9			
Intersection Capacity Utilization			40.1%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Missouri Flat Rd & US 50 WB Ramps

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑↑	↑↑	↑↑			↑↑	↑
Traffic Volume (vph)	0	0	0	487	1	289	368	517	0	0	483	116
Future Volume (vph)	0	0	0	487	1	289	368	517	0	0	483	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1649	1653	2787	3367	3505			3505	1547
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1649	1653	2787	3367	3505			3505	1547
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	541	1	321	409	574	0	0	537	129
RTOR Reduction (vph)	0	0	0	0	0	254	0	0	0	0	0	67
Lane Group Flow (vph)	0	0	0	270	272	67	409	574	0	0	537	62
Confl. Peds. (#/hr)									2			1
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	4%	3%	2%	2%	3%	3%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				19.9	19.9	19.9	15.1	65.0			45.9	45.9
Effective Green, g (s)				19.9	19.9	19.9	15.1	65.0			45.9	45.9
Actuated g/C Ratio				0.21	0.21	0.21	0.16	0.68			0.48	0.48
Clearance Time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Vehicle Extension (s)				1.0	1.0	1.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)				345	346	583	535	2398			1693	747
v/s Ratio Prot				0.16	c0.16		c0.12	0.16			c0.15	
v/s Ratio Perm						0.02						0.04
v/c Ratio				0.78	0.79	0.12	0.76	0.24			0.32	0.08
Uniform Delay, d1				35.5	35.5	30.4	38.2	5.7			15.0	13.2
Progression Factor				1.00	1.00	1.00	1.24	0.72			1.73	4.25
Incremental Delay, d2				10.2	10.4	0.0	5.1	0.2			0.5	0.2
Delay (s)				45.7	45.9	30.5	52.4	4.3			26.4	56.4
Level of Service				D	D	C	D	A			C	E
Approach Delay (s)	0.0				40.1			24.3			32.2	
Approach LOS	A				D			C			C	
Intersection Summary												
HCM 2000 Control Delay	31.8			HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	95.0			Sum of lost time (s)						14.1		
Intersection Capacity Utilization	49.9%			ICU Level of Service						A		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Missouri Flat Rd & US 50 EB Ramps

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	3					4	5	6	7	8
Traffic Volume (vph)	119	0	358	0	0	0	0	766	71	161	809	0
Future Volume (vph)	119	0	358	0	0	0	0	766	71	161	809	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Fr _t	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1633	1423	1475					3471	1583	3400	3505	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1633	1423	1475					3471	1583	3400	3505	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	132	0	398	0	0	0	0	851	79	179	899	0
RTOR Reduction (vph)	0	151	151	0	0	0	0	0	36	0	0	0
Lane Group Flow (vph)	119	57	52	0	0	0	0	851	43	179	899	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	5%	2%	4%	2%	2%	2%	2%	4%	2%	3%	3%	2%
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	12.0	12.0	12.0					45.5	45.5	25.0	74.0	
Effective Green, g (s)	12.0	12.0	12.0					45.5	45.5	25.0	74.0	
Actuated g/C Ratio	0.13	0.13	0.13					0.48	0.48	0.26	0.78	
Clearance Time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Vehicle Extension (s)	2.2	2.2	2.2					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	206	179	186					1662	758	894	2730	
v/s Ratio Prot	c0.07	0.04						c0.25		0.05	c0.26	
v/s Ratio Perm			0.04						0.03			
v/c Ratio	0.58	0.32	0.28					0.51	0.06	0.20	0.33	
Uniform Delay, d1	39.1	37.8	37.6					17.1	13.3	27.2	3.1	
Progression Factor	1.00	1.00	1.00					0.99	0.74	1.65	0.35	
Incremental Delay, d2	2.7	0.5	0.4					1.1	0.1	0.0	0.3	
Delay (s)	41.8	38.3	38.0					17.9	9.9	45.0	1.4	
Level of Service	D	D	D					B	A	D	A	
Approach Delay (s)		39.0			0.0			17.3			8.6	
Approach LOS		D			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			18.1					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			95.0					Sum of lost time (s)		12.5		
Intersection Capacity Utilization			49.9%					ICU Level of Service		A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Missouri Flat Rd & Mother Lode Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	119	40	44	718	1092	75
Future Volume (vph)	119	40	44	718	1092	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1719	3505	3505	1398
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1719	3505	3505	1398
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	132	44	49	798	1213	83
RTOR Reduction (vph)	0	38	0	0	0	26
Lane Group Flow (vph)	132	6	49	798	1213	57
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	2%	2%	5%	3%	3%	13%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8			2	
Actuated Green, G (s)	12.0	12.0	5.1	74.1	65.0	65.0
Effective Green, g (s)	12.0	12.0	5.1	74.1	65.0	65.0
Actuated g/C Ratio	0.13	0.13	0.05	0.78	0.68	0.68
Clearance Time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0
Lane Grp Cap (vph)	433	199	92	2733	2398	956
v/s Ratio Prot	c0.04		c0.03	0.23	c0.35	
v/s Ratio Perm		0.00			0.04	
v/c Ratio	0.30	0.03	0.53	0.29	0.51	0.06
Uniform Delay, d1	37.7	36.4	43.8	3.0	7.2	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.49	2.22
Incremental Delay, d2	0.1	0.0	2.9	0.3	0.7	0.1
Delay (s)	37.9	36.4	46.7	3.2	11.5	11.1
Level of Service	D	D	D	A	B	B
Approach Delay (s)	37.5			5.8	11.5	
Approach LOS	D			A	B	
Intersection Summary						
HCM 2000 Control Delay		11.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.48				
Actuated Cycle Length (s)		95.0		Sum of lost time (s)		12.9
Intersection Capacity Utilization		47.4%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Missouri Flat Rd & Forni Rd

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	205	75	14	53	41	162	21	841	58	224	692	216
Future Volume (vph)	205	75	14	53	41	162	21	841	58	224	692	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1827	1417	1770	1863	1568	1719	3505	1547	1770	3471	1546
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1827	1417	1770	1863	1568	1719	3505	1547	1770	3471	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	228	83	16	59	46	180	23	934	64	249	769	240
RTOR Reduction (vph)	0	0	13	0	0	160	0	0	40	0	0	74
Lane Group Flow (vph)	228	83	3	59	46	20	23	934	24	249	769	166
Confl. Peds. (#/hr)									2			2
Heavy Vehicles (%)	2%	4%	14%	2%	2%	3%	5%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	11.8	15.8	15.8	6.9	10.9	10.9	2.5	37.3	37.3	20.6	55.4	55.4
Effective Green, g (s)	11.8	15.8	15.8	6.9	10.9	10.9	2.5	37.3	37.3	20.6	55.4	55.4
Actuated g/C Ratio	0.12	0.16	0.16	0.07	0.11	0.11	0.03	0.38	0.38	0.21	0.56	0.56
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	410	292	227	123	205	173	43	1325	585	369	1950	868
v/s Ratio Prot	c0.07	c0.05		0.03	0.02		0.01	c0.27		c0.14	0.22	
v/s Ratio Perm			0.00			0.01			0.02			0.11
v/c Ratio	0.56	0.28	0.01	0.48	0.22	0.12	0.53	0.70	0.04	0.67	0.39	0.19
Uniform Delay, d1	40.9	36.4	34.8	44.1	40.0	39.5	47.5	26.0	19.4	35.9	12.2	10.6
Progression 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
Incremental Delay, d2	0.9	0.2	0.0	1.1	0.2	0.1	6.3	1.7	0.0	3.8	0.1	0.1
Delay (s)	41.9	36.6	34.8	45.2	40.2	39.6	53.7	27.7	19.4	39.7	12.3	10.7
Level of Service	D	D	C	D	D	D	D	C	B	D	B	B
Approach Delay (s)		40.2			40.9			27.8			17.4	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			26.0									C
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			98.6									18.0
Intersection Capacity Utilization			60.1%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Missouri Flat Rd & Golden Center Dr

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	5	10	35	5	8	39	867	93	114	624	3
Future Volume (vph)	4	5	10	35	5	8	39	867	93	114	624	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00				1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00				1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00				1.00		1.00	1.00		1.00	1.00	1.00
Fr _t	0.93				0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.99				0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630				1741		1770	3446		1770	3438	1182
Flt Permitted	0.92				0.76		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1514				1378		1770	3446		1770	3438	1182
Peak-hour factor, PHF	0.59	0.59	0.59	0.71	0.71	0.71	0.94	0.94	0.94	0.83	0.83	0.83
Adj. Flow (vph)	7	8	17	49	7	11	41	922	99	137	752	4
RTOR Reduction (vph)	0	15	0	0	8	0	0	7	0	0	0	2
Lane Group Flow (vph)	0	17	0	0	59	0	41	1014	0	137	752	2
Confl. Peds. (#/hr)							1			2		5
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	25%	2%	2%	3%	2%	2%	2%	3%	3%	2%	5%	33%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	6.0			6.0			2.5	30.0		8.1	35.6	35.6
Effective Green, g (s)	6.0			6.0			2.5	30.0		8.1	35.6	35.6
Actuated g/C Ratio	0.11			0.11			0.04	0.53		0.14	0.62	0.62
Clearance Time (s)	4.0			4.0			4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	159			144			77	1810		251	2143	736
v/s Ratio Prot							0.02	c0.29		c0.08	0.22	
v/s Ratio Perm	0.01			c0.04								0.00
v/c Ratio	0.11			0.41			0.53	0.56		0.55	0.35	0.00
Uniform Delay, d1	23.1			23.9			26.7	9.1		22.8	5.2	4.1
Progression Factor	1.00			1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3			1.9			6.9	0.4		2.4	0.1	0.0
Delay (s)	23.4			25.8			33.6	9.5		25.2	5.3	4.1
Level of Service	C			C			C	A		C	A	A
Approach Delay (s)	23.4			25.8				10.4			8.3	
Approach LOS	C			C				B			A	
Intersection Summary												
HCM 2000 Control Delay	10.2									B		
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	57.1									13.0		
Intersection Capacity Utilization	52.0%									A		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
10: Driveway/China Garden Rd & Missouri Flat Rd

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	6	0	107	0	904	10	105	540	0
Future Volume (Veh/h)	1	0	0	6	0	107	0	904	10	105	540	0
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.25	0.25	0.25	0.78	0.78	0.78	0.95	0.95	0.95	0.90	0.90	0.90
Hourly flow rate (vph)	4	0	0	8	0	137	0	952	11	117	600	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh									2			
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1928	1797	600	1792	1792	958	600				963	
vC1, stage 1 conf vol	834	834		958	958							
vC2, stage 2 conf vol	1094	963		834	834							
vCu, unblocked vol	1928	1797	600	1792	1792	958	600				963	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	86	100	100	96	100	56	100				84	
cM capacity (veh/h)	28	185	501	217	235	312	977				715	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	4	145	963	117	600							
Volume Left	4	8	0	117	0							
Volume Right	0	137	11	0	0							
cSH	28	305	977	715	1700							
Volume to Capacity	0.14	0.48	0.00	0.16	0.35							
Queue Length 95th (ft)	11	61	0	15	0							
Control Delay (s)	154.9	27.1	0.0	11.0	0.0							
Lane LOS	F	D		B								
Approach Delay (s)	154.9	27.1	0.0	1.8								
Approach LOS	F	D										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization		93.4%			ICU Level of Service				F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Missouri Flat Road & Industrial Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	12	11	896	541	22
Future Volume (Veh/h)	13	12	11	896	541	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	15	14	13	1018	615	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1672	628	640			
vC1, stage 1 conf vol	628					
vC2, stage 2 conf vol	1044					
vCu, unblocked vol	1672	628	640			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	99			
cM capacity (veh/h)	290	481	939			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	29	13	1018	640		
Volume Left	15	13	0	0		
Volume Right	14	0	0	25		
cSH	359	939	1700	1700		
Volume to Capacity	0.08	0.01	0.60	0.38		
Queue Length 95th (ft)	7	1	0	0		
Control Delay (s)	15.9	8.9	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	15.9	0.1		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization		57.2%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

12: Missouri Flat Road & Enterprise Dr

01/03/2018

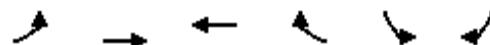


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	0	13	1	0	4	17	844	6	4	419	94
Future Volume (Veh/h)	51	0	13	1	0	4	17	844	6	4	419	94
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	59	0	15	1	0	5	20	981	7	5	487	109
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)									2			2
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1578	1580	542	1536	1630	984	596				988	
vC1, stage 1 conf vol	552	552			1024	1024						
vC2, stage 2 conf vol	1026	1028			512	606						
vCu, unblocked vol	1578	1580	542	1536	1630	984	596				988	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	75	100	97	100	100	98	98				99	
cM capacity (veh/h)	240	266	539	248	263	300	976				696	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	74	6	20	988	5	596						
Volume Left	59	1	20	0	5	0						
Volume Right	15	5	0	7	0	109						
cSH	271	290	976	1700	696	1700						
Volume to Capacity	0.27	0.02	0.02	0.58	0.01	0.35						
Queue Length 95th (ft)	27	2	2	0	1	0						
Control Delay (s)	23.2	17.7	8.8	0.0	10.2	0.0						
Lane LOS	C	C	A		B							
Approach Delay (s)	23.2	17.7	0.2		0.1							
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization		61.7%			ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

13: Pleasant Valley Rd & Missouri Flat Rd

01/03/2018

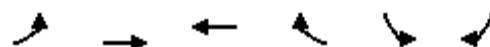


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	304	178	392	533	185	205
Future Volume (vph)	304	178	392	533	185	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	1776	1845	1583	1671	1512
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	1776	1845	1583	1671	1512
Peak-hour factor, PHF	0.80	0.80	0.91	0.92	0.81	0.81
Adj. Flow (vph)	380	222	431	579	228	253
RTOR Reduction (vph)	0	0	0	56	0	123
Lane Group Flow (vph)	380	223	431	523	228	130
Confl. Peds. (#/hr)						2
Heavy Vehicles (%)	3%	7%	3%	2%	8%	6%
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	7	7	5
Permitted Phases				6		4
Actuated Green, G (s)	12.3	36.3	20.0	34.0	14.0	26.3
Effective Green, g (s)	12.3	36.3	20.0	34.0	14.0	26.3
Actuated g/C Ratio	0.21	0.62	0.34	0.58	0.24	0.45
Clearance Time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	708	1092	625	912	396	673
v/s Ratio Prot	c0.11	0.13	c0.23	0.14	c0.14	0.04
v/s Ratio Perm				0.19		0.05
v/c Ratio	0.54	0.20	0.69	0.57	0.58	0.19
Uniform Delay, d1	20.8	5.0	16.8	7.9	19.9	9.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	2.5	0.5	1.3	0.1
Delay (s)	21.2	5.0	19.4	8.5	21.1	10.0
Level of Service	C	A	B	A	C	A
Approach Delay (s)		15.2	13.1		15.3	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay		14.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		59.0		Sum of lost time (s)		12.7
Intersection Capacity Utilization		50.1%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

14: Pleasant Valley Rd & Commerce Way

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	464	518	79	18	19
Future Volume (Veh/h)	31	464	518	79	18	19
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.78	0.78	0.79	0.79	0.66	0.66
Hourly flow rate (vph)	40	595	656	100	27	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (ft)			750			
pX, platoon unblocked	0.84			0.84	0.84	
vC, conflicting volume	756			1331	656	
vC1, stage 1 conf vol				656		
vC2, stage 2 conf vol				675		
vCu, unblocked vol	614			1299	495	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	95			93	94	
cM capacity (veh/h)	807			368	481	
Direction, Lane #	EB 1	WB 1	WB 2	SB 1		
Volume Total	635	656	100	56		
Volume Left	40	0	0	27		
Volume Right	0	0	100	29		
cSH	807	1700	1700	419		
Volume to Capacity	0.05	0.39	0.06	0.13		
Queue Length 95th (ft)	4	0	0	11		
Control Delay (s)	1.3	0.0	0.0	14.9		
Lane LOS	A			B		
Approach Delay (s)	1.3	0.0		14.9		
Approach LOS				B		
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		59.9%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

15: Pleasant Valley Rd & Forni Rd

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	135	337	323	33	50	101
Future Volume (Veh/h)	135	337	323	33	50	101
Sign Control	Free	Free		Stop		
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	180	449	431	44	67	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	475			1262	453	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	475			1262	453	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	83			57	78	
cM capacity (veh/h)	1082			156	605	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	629	475	202			
Volume Left	180	0	67			
Volume Right	0	44	135			
cSH	1082	1700	309			
Volume to Capacity	0.17	0.28	0.65			
Queue Length 95th (ft)	15	0	107			
Control Delay (s)	4.0	0.0	36.2			
Lane LOS	A		E			
Approach Delay (s)	4.0	0.0	36.2			
Approach LOS			E			
Intersection Summary						
Average Delay		7.5				
Intersection Capacity Utilization		63.2%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
16: SR-49 & Pleasant Valley Rd

01/03/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↑	↑	↑	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	243	85	141	287	224	238
Future Volume (vph)	243	85	141	287	224	238
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	312	109	181	368	287	305
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total (vph)	421	181	368	592		
Volume Left (vph)	0	181	0	287		
Volume Right (vph)	109	0	0	305		
Hadj (s)	-0.10	0.55	0.05	-0.16		
Departure Headway (s)	6.8	7.9	7.4	6.5		
Degree Utilization, x	0.79	0.40	0.76	1.06		
Capacity (veh/h)	523	450	479	566		
Control Delay (s)	31.0	14.8	28.6	80.5		
Approach Delay (s)	31.0	24.1		80.5		
Approach LOS	D	C		F		
Intersection Summary						
Delay				47.3		
Level of Service				E		
Intersection Capacity Utilization			62.8%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Pleasant Valley Rd & China Garden Rd

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	359	883	50	3	9
Future Volume (Veh/h)	11	359	883	50	3	9
Sign Control	Free	Free		Stop		
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	12	395	970	55	3	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1025			1416	998	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1025			1416	998	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			98	97	
cM capacity (veh/h)	673			148	295	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	407	1025	13			
Volume Left	12	0	3			
Volume Right	0	55	10			
cSH	673	1700	240			
Volume to Capacity	0.02	0.60	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.5	0.0	20.9			
Lane LOS	A		C			
Approach Delay (s)	0.5	0.0	20.9			
Approach LOS			C			
Intersection Summary						
Average Delay		0.3				
Intersection Capacity Utilization		59.5%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

18: Pleasant Valley Rd & SR 49

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘		↑ ↗	↑ ↘	↑ ↙		↑ ↗	↑ ↘	↑ ↙	↑ ↘	
Traffic Volume (vph)	97	258	25	19	780	154	88	23	10	60	5	105
Future Volume (vph)	97	258	25	19	780	154	88	23	10	60	5	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.6		3.0	4.6	4.6		4.1	4.1	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1671	3338		1770	1863	1583		1792	1563	1719	1499	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1671	3338		1770	1863	1583		1792	1563	1719	1499	
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.77	0.77	0.77	0.89	0.89	0.89
Adj. Flow (vph)	110	293	28	21	876	173	114	30	13	67	6	118
RTOR Reduction (vph)	0	3	0	0	0	29	0	0	11	0	108	0
Lane Group Flow (vph)	110	318	0	21	876	144	0	144	2	67	16	0
Confl. Peds. (#/hr)										1		
Heavy Vehicles (%)	8%	7%	4%	2%	2%	2%	2%	2%	2%	5%	2%	9%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2			4			
Actuated Green, G (s)	10.9	60.8		2.5	52.4	52.4		12.5	12.5	8.3	8.3	
Effective Green, g (s)	10.9	60.8		2.5	52.4	52.4		12.5	12.5	8.3	8.3	
Actuated g/C Ratio	0.11	0.62		0.03	0.53	0.53		0.13	0.13	0.08	0.08	
Clearance Time (s)	3.0	4.6		3.0	4.6	4.6		4.1	4.1	3.0	3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	184	2054		44	988	839		226	197	144	125	
v/s Ratio Prot	c0.07	0.10		0.01	c0.47			c0.08		c0.04	0.01	
v/s Ratio Perm						0.09			0.00			
v/c Ratio	0.60	0.15		0.48	0.89	0.17		0.64	0.01	0.47	0.13	
Uniform Delay, d1	41.9	8.1		47.5	20.6	12.0		41.0	37.7	43.1	41.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.0		3.0	9.4	0.0		4.3	0.0	0.9	0.2	
Delay (s)	45.3	8.1		50.5	30.0	12.0		45.3	37.7	44.0	42.1	
Level of Service	D	A		D	C	B		D	D	D	D	
Approach Delay (s)		17.6			27.5			44.7			42.7	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay		28.2			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		98.8			Sum of lost time (s)				14.7			
Intersection Capacity Utilization		70.2%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

19: Diamond Rd & Lime Kiln Rd/Black Rice Ln

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	3	10	7	4	2	31	188	15	12	193	29
Future Volume (Veh/h)	23	3	10	7	4	2	31	188	15	12	193	29
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	3	11	8	4	2	34	204	16	13	210	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	536	540	226	544	548	212	242			220		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	540	226	544	548	212	242			220		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	99	99	98	99	100	97			99		
cM capacity (veh/h)	437	431	811	428	427	826	1319			1343		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	39	14	254	255								
Volume Left	25	8	34	13								
Volume Right	11	2	16	32								
cSH	502	459	1319	1343								
Volume to Capacity	0.08	0.03	0.03	0.01								
Queue Length 95th (ft)	6	2	2	1								
Control Delay (s)	12.8	13.1	1.2	0.5								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.8	13.1	1.2	0.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization		32.0%			ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsigned Intersection Capacity Analysis

21: Diamond Rd & Bradley Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	
Traffic Volume (veh/h)	5	17	35	198	217	13
Future Volume (Veh/h)	5	17	35	198	217	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.83	0.83	0.68	0.68
Hourly flow rate (vph)	6	19	42	239	319	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	652	328	338			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	328	338			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	97			
cM capacity (veh/h)	416	711	1216			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	25	42	239	338		
Volume Left	6	42	0	0		
Volume Right	19	0	0	19		
cSH	935	1216	1700	1700		
Volume to Capacity	0.03	0.03	0.14	0.20		
Queue Length 95th (ft)	2	3	0	0		
Control Delay (s)	11.1	8.1	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	11.1	1.2		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		28.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
22: US-50 WB On-ramp/US-50 WB Off-ramp & El Dorado Rd

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	124	0	22	105	178	0	0	56	62
Future Volume (Veh/h)	0	0	0	124	0	22	105	178	0	0	56	62
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.77	0.77	0.77	0.82	0.82	0.82
Hourly flow rate (vph)	0	0	0	165	0	29	136	231	0	0	68	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	638	609	106	609	647	231	144			231		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	638	609	106	609	647	231	144			231		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	56	100	96	91			100		
cM capacity (veh/h)	347	370	946	376	352	806	1432			1331		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	194	367	144									
Volume Left	165	136	0									
Volume Right	29	0	76									
cSH	409	1432	1700									
Volume to Capacity	0.47	0.09	0.08									
Queue Length 95th (ft)	62	8	0									
Control Delay (s)	21.5	3.4	0.0									
Lane LOS	C	A										
Approach Delay (s)	21.5	3.4	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay		7.7										
Intersection Capacity Utilization		36.7%										
Analysis Period (min)		15										
ICU Level of Service												
A												

HCM Unsignalized Intersection Capacity Analysis
23: El Dorado Rd & US-50 EB Off-ramp/US-50 EB On-ramp

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	2	98	0	0	0	0	193	87	24	156	0
Future Volume (Veh/h)	90	2	98	0	0	0	0	193	87	24	156	0
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.83	0.83	0.83	0.69	0.69	0.69
Hourly flow rate (vph)	102	2	111	0	0	0	0	233	105	35	226	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	582	634	226	694	582	286	226			338		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	582	634	226	694	582	286	226			338		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	99	86	100	100	100	100			97		
cM capacity (veh/h)	414	384	811	299	411	751	1337			1216		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	215	338	261									
Volume Left	102	0	35									
Volume Right	111	105	0									
cSH	553	1700	1216									
Volume to Capacity	0.39	0.20	0.03									
Queue Length 95th (ft)	46	0	2									
Control Delay (s)	15.6	0.0	1.3									
Lane LOS	C		A									
Approach Delay (s)	15.6	0.0	1.3									
Approach LOS	C											
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization		46.1%			ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: EI Dorado Rd & Missouri Flat Rd

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑			↔			↔	
Traffic Volume (vph)	9	222	36	27	299	139	43	49	38	83	31	8
Future Volume (vph)	9	222	36	27	299	139	43	49	38	83	31	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0				3.5			3.5
Lane Util. Factor	1.00	1.00		1.00	1.00				1.00			1.00
Frt	1.00	0.98		1.00	0.95				0.96			0.99
Flt Protected	0.95	1.00		0.95	1.00				0.98			0.97
Satd. Flow (prot)	1770	1824		1770	1774				1760			1786
Flt Permitted	0.95	1.00		0.95	1.00				0.88			0.64
Satd. Flow (perm)	1770	1824		1770	1774				1571			1186
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.74	0.74	0.74	0.78	0.78	0.78
Adj. Flow (vph)	10	247	40	30	336	156	58	66	51	106	40	10
RTOR Reduction (vph)	0	5	0	0	12	0	0	18	0	0	3	0
Lane Group Flow (vph)	10	282	0	30	480	0	0	157	0	0	153	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6				4			8
Permitted Phases								4			8	
Actuated Green, G (s)	1.0	38.0		2.5	39.5				13.4			13.4
Effective Green, g (s)	1.0	38.0		2.5	39.5				13.4			13.4
Actuated g/C Ratio	0.02	0.57		0.04	0.59				0.20			0.20
Clearance Time (s)	4.0	5.0		4.0	5.0				3.5			3.5
Vehicle Extension (s)	2.5	2.5		2.5	2.5				2.0			3.0
Lane Grp Cap (vph)	26	1043		66	1055				317			239
v/s Ratio Prot	0.01	0.15		c0.02	c0.27							
v/s Ratio Perm									0.10			c0.13
v/c Ratio	0.38	0.27		0.45	0.45				0.50			0.64
Uniform Delay, d1	32.4	7.2		31.3	7.5				23.5			24.3
Progression Factor	1.00	1.00		1.00	1.00				1.00			1.00
Incremental Delay, d2	6.8	0.6		3.6	1.4				0.4			5.5
Delay (s)	39.2	7.8		34.9	8.9				24.0			29.8
Level of Service	D	A		C	A				C			C
Approach Delay (s)		8.9			10.4				24.0			29.8
Approach LOS		A			B				C			C

Intersection Summary

HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	12.5
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

2: Headington Rd & Missouri Flat Rd

01/03/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↗ ↑	↑ ↘	↗ ↘	↖ ↗	↑ ↘
Traffic Volume (veh/h)	26	59	408	12	29	317
Future Volume (Veh/h)	26	59	408	12	29	317
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.93	0.93
Hourly flow rate (vph)	37	83	453	13	31	341
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	862	460		466		
vC1, stage 1 conf vol	460					
vC2, stage 2 conf vol	403					
vCu, unblocked vol	862	460		466		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	93	86		97		
cM capacity (veh/h)	523	602		1095		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	37	83	466	31	341	
Volume Left	37	0	0	31	0	
Volume Right	0	83	13	0	0	
cSH	523	602	1700	1095	1700	
Volume to Capacity	0.07	0.14	0.27	0.03	0.20	
Queue Length 95th (ft)	6	12	0	2	0	
Control Delay (s)	12.4	11.9	0.0	8.4	0.0	
Lane LOS	B	B		A		
Approach Delay (s)	12.1		0.0	0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization		34.1%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

3: Missouri Flat Rd & Plaza Dr

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	51	331	432	43	50	336	292	419	47	338	19
Future Volume (vph)	28	51	331	432	43	50	336	292	419	47	338	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5			3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor	0.95	0.95	0.95	0.95			0.97	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	0.99	0.99	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Fr _t	0.91	0.85	1.00	0.97			1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.99	1.00	0.95	0.97			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1579	1483	1681	1665			3433	3539	1583	1770	3508	
Flt Permitted	0.99	1.00	0.95	0.97			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1579	1483	1681	1665			3433	3539	1583	1770	3508	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	54	348	455	45	53	354	307	441	49	356	20
RTOR Reduction (vph)	0	74	180	0	9	0	0	0	248	0	3	0
Lane Group Flow (vph)	0	148	29	278	266	0	354	307	193	49	373	0
Confl. Peds. (#/hr)	2		1				1					2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7					6				
Actuated Green, G (s)	13.2	13.2	20.3	20.3			13.4	41.6	41.6	5.0	33.2	
Effective Green, g (s)	13.2	13.2	20.3	20.3			13.4	41.6	41.6	5.0	33.2	
Actuated g/C Ratio	0.14	0.14	0.21	0.21			0.14	0.44	0.44	0.05	0.35	
Clearance Time (s)	3.5	3.5	3.5	3.5			3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	219	206	359	355			484	1549	693	93	1225	
v/s Ratio Prot	c0.09		c0.17	0.16			c0.10	0.09		c0.03	c0.11	
v/s Ratio Perm			0.02						0.12			
v/c Ratio	0.68	0.14	0.77	0.75			0.73	0.20	0.28	0.53	0.30	
Uniform Delay, d1	38.9	35.9	35.2	35.0			39.1	16.4	17.1	43.8	22.5	
Progression Factor	1.00	1.00	1.00	1.00			1.13	1.22	2.76	1.00	1.00	
Incremental Delay, d2	6.3	0.1	9.2	7.4			4.7	0.3	1.0	2.5	0.6	
Delay (s)	45.2	36.0	44.3	42.3			48.8	20.4	48.1	46.3	23.1	
Level of Service	D	D	D	D			D	C	D	D	C	
Approach Delay (s)	40.8			43.3				40.6			25.8	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay	38.7											D
HCM 2000 Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	95.0											14.9
Intersection Capacity Utilization	63.9%											B
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Missouri Flat Rd & US 50 WB Ramps

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑↑	↑↑	↑↑			↑↑	↑
Traffic Volume (vph)	0	0	0	636	0	394	366	653	0	0	914	187
Future Volume (vph)	0	0	0	636	0	394	366	653	0	0	914	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1665	1665	2787	3433	3539			3539	1560
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1665	1665	2787	3433	3539			3539	1560
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	669	0	415	385	687	0	0	962	197
RTOR Reduction (vph)	0	0	0	0	0	287	0	0	0	0	0	108
Lane Group Flow (vph)	0	0	0	334	335	128	385	687	0	0	962	89
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				23.8	23.8	23.8	14.2	61.1			42.9	42.9
Effective Green, g (s)				23.8	23.8	23.8	14.2	61.1			42.9	42.9
Actuated g/C Ratio				0.25	0.25	0.25	0.15	0.64			0.45	0.45
Clearance Time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Vehicle Extension (s)				1.0	1.0	1.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)				417	417	698	513	2276			1598	704
v/s Ratio Prot				0.20	c0.20		c0.11	0.19			c0.27	
v/s Ratio Perm						0.05						0.06
v/c Ratio				0.80	0.80	0.18	0.75	0.30			0.60	0.13
Uniform Delay, d1				33.4	33.4	28.0	38.7	7.5			19.6	15.2
Progression Factor				1.00	1.00	1.00	1.13	1.13			1.05	2.12
Incremental Delay, d2				10.0	10.1	0.0	4.2	0.3			1.5	0.3
Delay (s)				43.4	43.5	28.0	47.9	8.8			22.1	32.5
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)	0.0				37.5			22.8			23.9	
Approach LOS	A				D			C			C	
Intersection Summary												
HCM 2000 Control Delay				28.0							C	
HCM 2000 Volume to Capacity ratio				0.69								
Actuated Cycle Length (s)				95.0							14.1	
Intersection Capacity Utilization				65.1%							C	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Missouri Flat Rd & US 50 EB Ramps

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↔	↑					↑↑	↑	↑↑	↑↑	
Traffic Volume (vph)	191	4	587	0	0	0	0	828	106	376	1174	0
Future Volume (vph)	191	4	587	0	0	0	0	828	106	376	1174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00	1.00					1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Fr _t	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1455	1504					3539	1562	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1455	1504					3539	1562	3433	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	201	4	618	0	0	0	0	872	112	396	1236	0
RTOR Reduction (vph)	0	66	66	0	0	0	0	0	42	0	0	0
Lane Group Flow (vph)	181	255	255	0	0	0	0	872	70	396	1236	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	20.5	20.5	20.5					37.0	37.0	25.0	65.5	
Effective Green, g (s)	20.5	20.5	20.5					37.0	37.0	25.0	65.5	
Actuated g/C Ratio	0.22	0.22	0.22					0.39	0.39	0.26	0.69	
Clearance Time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Vehicle Extension (s)	2.2	2.2	2.2					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	362	313	324					1378	608	903	2440	
v/s Ratio Prot	0.11	c0.18						c0.25		0.12	c0.35	
v/s Ratio Perm			0.17						0.04			
v/c Ratio	0.50	0.82	0.79					0.63	0.11	0.44	0.51	
Uniform Delay, d1	32.7	35.4	35.2					23.5	18.5	29.2	7.0	
Progression Factor	1.00	1.00	1.00					1.04	0.98	1.29	0.27	
Incremental Delay, d2	0.6	14.4	11.3					2.2	0.4	0.1	0.6	
Delay (s)	33.3	49.8	46.4					26.6	18.5	37.7	2.5	
Level of Service	C	D	D					C	B	D	A	
Approach Delay (s)		44.9			0.0			25.6			11.1	
Approach LOS		D			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		23.3		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		95.0		Sum of lost time (s)				12.5				
Intersection Capacity Utilization		65.1%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Missouri Flat Rd & Mother Lode Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	168	64	52	766	1545	216
Future Volume (vph)	168	64	52	766	1545	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1568	1770	3539	3539	1547
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1568	1770	3539	3539	1547
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	177	67	55	806	1626	227
RTOR Reduction (vph)	0	58	0	0	0	65
Lane Group Flow (vph)	177	9	55	806	1626	162
Confl. Peds. (#/hr)						1
Confl. Bikes (#/hr)						2
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8			2	
Actuated Green, G (s)	12.9	12.9	6.5	73.2	62.7	62.7
Effective Green, g (s)	12.9	12.9	6.5	73.2	62.7	62.7
Actuated g/C Ratio	0.14	0.14	0.07	0.77	0.66	0.66
Clearance Time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0
Lane Grp Cap (vph)	466	212	121	2726	2335	1021
v/s Ratio Prot	c0.05		c0.03	0.23	c0.46	
v/s Ratio Perm		0.01			0.10	
v/c Ratio	0.38	0.04	0.45	0.30	0.70	0.16
Uniform Delay, d1	37.4	35.7	42.5	3.2	10.2	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.23	1.53
Incremental Delay, d2	0.2	0.0	1.0	0.3	1.4	0.3
Delay (s)	37.6	35.7	43.5	3.5	13.9	9.7
Level of Service	D	D	D	A	B	A
Approach Delay (s)	37.1			6.1	13.4	
Approach LOS	D			A	B	
Intersection Summary						
HCM 2000 Control Delay		13.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.63				
Actuated Cycle Length (s)		95.0		Sum of lost time (s)		12.9
Intersection Capacity Utilization		55.4%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Missouri Flat Rd & Forni Rd

01/03/2018

Movement	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑↑	↑↑
Traffic Volume (vph)	461	34	42	31	48	179	47	758	22	146	1136	327
Future Volume (vph)	461	34	42	31	48	179	47	758	22	146	1136	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	*1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3539	1863	1583	1770	1863	1557	1770	3539	1451	1770	3539	1549
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3539	1863	1583	1770	1863	1557	1770	3539	1451	1770	3539	1549
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	485	36	44	33	51	188	49	798	23	154	1196	344
RTOR Reduction (vph)	0	0	32	0	0	169	0	0	15	0	0	87
Lane Group Flow (vph)	485	36	12	33	51	19	49	798	8	154	1196	257
Confl. Bikes (#/hr)						2			1			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	19.6	25.1	25.1	4.1	9.6	9.6	6.1	35.4	35.4	13.3	42.6	42.6
Effective Green, g (s)	19.6	25.1	25.1	4.1	9.6	9.6	6.1	35.4	35.4	13.3	42.6	42.6
Actuated g/C Ratio	0.20	0.26	0.26	0.04	0.10	0.10	0.06	0.37	0.37	0.14	0.44	0.44
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	723	487	414	75	186	155	112	1306	535	245	1572	688
v/s Ratio Prot	c0.14	0.02		0.02	c0.03		0.03	0.23		c0.09	c0.34	
v/s Ratio Perm			0.01			0.01			0.01			0.17
v/c Ratio	0.67	0.07	0.03	0.44	0.27	0.12	0.44	0.61	0.02	0.63	0.76	0.37
Uniform Delay, d1	35.2	26.7	26.3	44.8	39.9	39.3	43.2	24.6	19.2	39.0	22.4	17.8
Progression 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
Incremental Delay, d2	1.9	0.0	0.0	1.5	0.3	0.1	1.0	0.9	0.0	3.6	2.2	0.3
Delay (s)	37.1	26.7	26.3	46.3	40.2	39.4	44.2	25.5	19.2	42.6	24.6	18.1
Level of Service	D	C	C	D	D	D	D	C	B	D	C	B
Approach Delay (s)		35.6			40.4			26.4			24.9	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.3									C
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			95.9									18.0
Intersection Capacity Utilization			66.2%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Missouri Flat Rd & Golden Center Dr

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	9	81	105	14	57	70	698	51	96	1028	7
Future Volume (vph)	14	9	81	105	14	57	70	698	51	96	1028	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
	4.0				4.0			4.0	5.0		4.0	5.0
Lane Util. Factor	1.00				1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	0.98				1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00				1.00			1.00	1.00		1.00	1.00
Fr _t	0.89				0.96			1.00	0.99		1.00	1.00
Flt Protected	0.99				0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1627				1720			1770	3498		1770	3539
Flt Permitted	0.95				0.76			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1558				1344			1770	3498		1770	3539
Peak-hour factor, PHF	0.81	0.81	0.81	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	17	11	100	109	15	59	75	751	55	103	1105	8
RTOR Reduction (vph)	0	76	0	0	17	0	0	6	0	0	0	4
Lane Group Flow (vph)	0	52	0	0	166	0	75	800	0	103	1105	4
Confl. Peds. (#/hr)												7
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	15.1			15.1			6.8	28.3		7.7	29.2	29.2
Effective Green, g (s)	15.1			15.1			6.8	28.3		7.7	29.2	29.2
Actuated g/C Ratio	0.24			0.24			0.11	0.44		0.12	0.46	0.46
Clearance Time (s)	4.0			4.0			4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	367			316			187	1544		212	1612	698
v/s Ratio Prot							0.04	0.23		c0.06	c0.31	
v/s Ratio Perm	0.03			c0.12								0.00
v/c Ratio	0.14			0.53			0.40	0.52		0.49	0.69	0.01
Uniform Delay, d1	19.4			21.4			26.7	13.0		26.4	13.8	9.5
Progression Factor	1.00			1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2			1.6			1.4	0.3		1.8	1.2	0.0
Delay (s)	19.5			23.0			28.2	13.3		28.1	15.0	9.5
Level of Service	B			C			C	B		C	B	A
Approach Delay (s)	19.5			23.0				14.5			16.1	
Approach LOS	B			C				B			B	
Intersection Summary												
HCM 2000 Control Delay	16.2											B
HCM 2000 Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	64.1											13.0
Intersection Capacity Utilization	59.8%											B
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

10: China Garden Rd & Missouri Flat Rd

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	12	1	140	2	682	29	142	1026	1
Future Volume (Veh/h)	2	0	0	12	1	140	2	682	29	142	1026	1
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Hourly flow rate (vph)	8	0	0	14	1	165	2	741	32	148	1069	1
Pedestrians												1
Lane Width (ft)												12.0
Walking Speed (ft/s)												4.0
Percent Blockage												0
Right turn flare (veh)												
Median type								TWLTL				None
Median storage veh)									2			
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2293	2142	1070	2126	2127	758	1070					773
vC1, stage 1 conf vol	1366	1366			761	761						
vC2, stage 2 conf vol	928	777			1365	1366						
vCu, unblocked vol	2293	2142	1070	2126	2127	758	1070					773
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	80	100	100	90	99	59	100					82
cM capacity (veh/h)	40	147	269	136	159	407	651					833
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	8	180	775	148	1070							
Volume Left	8	14	2	148	0							
Volume Right	0	165	32	0	1							
cSH	40	350	651	833	1700							
Volume to Capacity	0.20	0.51	0.00	0.18	0.63							
Queue Length 95th (ft)	16	70	0	16	0							
Control Delay (s)	116.4	25.7	0.1	10.3	0.0							
Lane LOS	F	D	A	B								
Approach Delay (s)	116.4	25.7	0.1	1.2								
Approach LOS	F	D										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization		111.1%			ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Missouri Flat Road & Industrial Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	18	7	663	1021	11
Future Volume (Veh/h)	18	18	7	663	1021	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	20	20	8	729	1122	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1873	1128	1134			
vC1, stage 1 conf vol	1128					
vC2, stage 2 conf vol	745					
vCu, unblocked vol	1873	1128	1134			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	92	99			
cM capacity (veh/h)	260	249	616			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	40	8	729	1134		
Volume Left	20	8	0	0		
Volume Right	20	0	0	12		
cSH	254	616	1700	1700		
Volume to Capacity	0.16	0.01	0.43	0.67		
Queue Length 95th (ft)	14	1	0	0		
Control Delay (s)	21.8	10.9	0.0	0.0		
Lane LOS	C	B				
Approach Delay (s)	21.8	0.1		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		64.4%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

12: Missouri Flat Road & Enterprise Dr

01/03/2018

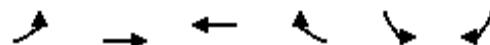


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1	30	1	1	1	7	573	2	4	934	62
Future Volume (Veh/h)	78	1	30	1	1	1	7	573	2	4	934	62
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	83	1	32	1	1	1	7	610	2	4	994	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)									2			2
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1660	1661	1027	1660	1693	611	1060				612	
vC1, stage 1 conf vol	1035	1035			625	625						
vC2, stage 2 conf vol	626	626			1034	1068						
vCu, unblocked vol	1660	1661	1027	1660	1693	611	1060				612	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	66	100	89	100	100	100	99				100	
cM capacity (veh/h)	242	265	285	215	254	494	657				962	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	116	3	7	612	4	1060						
Volume Left	83	1	7	0	4	0						
Volume Right	32	1	0	2	0	66						
cSH	252	282	657	1700	962	1700						
Volume to Capacity	0.46	0.01	0.01	0.36	0.00	0.62						
Queue Length 95th (ft)	56	1	1	0	0	0						
Control Delay (s)	30.8	17.9	10.5	0.0	8.8	0.0						
Lane LOS	D	C	B		A							
Approach Delay (s)	30.8	17.9	0.1		0.0							
Approach LOS	D	C										
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization		71.8%			ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

13: Pleasant Valley Rd & Missouri Flat Rd

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	232	259	253	327	717	304
Future Volume (vph)	232	259	253	327	717	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1863	1863	1583	1770	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1863	1863	1583	1770	1553
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.88	0.88
Adj. Flow (vph)	247	276	281	363	815	345
RTOR Reduction (vph)	0	0	0	93	0	141
Lane Group Flow (vph)	247	276	281	270	815	204
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	7	7	5
Permitted Phases				6		4
Actuated Green, G (s)	9.3	27.9	14.6	44.9	30.3	39.6
Effective Green, g (s)	9.3	27.9	14.6	44.9	30.3	39.6
Actuated g/C Ratio	0.14	0.42	0.22	0.67	0.45	0.59
Clearance Time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	477	776	406	1062	801	919
v/s Ratio Prot	c0.07	0.15	c0.15	0.11	c0.46	0.03
v/s Ratio Perm				0.06		0.10
v/c Ratio	0.52	0.36	0.69	0.25	1.02	0.22
Uniform Delay, d1	26.7	13.3	24.1	4.4	18.3	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	4.1	0.0	36.2	0.0
Delay (s)	27.1	13.4	28.2	4.4	54.5	6.5
Level of Service	C	B	C	A	D	A
Approach Delay (s)		19.9	14.8		40.2	
Approach LOS		B	B		D	
Intersection Summary						
HCM 2000 Control Delay			28.6	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			66.9	Sum of lost time (s)		12.7
Intersection Capacity Utilization			70.2%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

14: Pleasant Valley Rd & Commerce Way

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	508	517	40	52	48
Future Volume (Veh/h)	14	508	517	40	52	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.85	0.85	0.79	0.79
Hourly flow rate (vph)	15	558	608	47	66	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (ft)			750			
pX, platoon unblocked	0.89			0.89	0.89	
vC, conflicting volume	655			1196	608	
vC1, stage 1 conf vol				608		
vC2, stage 2 conf vol				588		
vCu, unblocked vol	555			1160	502	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			84	88	
cM capacity (veh/h)	908			416	509	
Direction, Lane #	EB 1	WB 1	WB 2	SB 1		
Volume Total	573	608	47	127		
Volume Left	15	0	0	66		
Volume Right	0	0	47	61		
cSH	908	1700	1700	456		
Volume to Capacity	0.02	0.36	0.03	0.28		
Queue Length 95th (ft)	1	0	0	28		
Control Delay (s)	0.5	0.0	0.0	15.9		
Lane LOS	A			C		
Approach Delay (s)	0.5	0.0		15.9		
Approach LOS				C		
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		50.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

15: Pleasant Valley Rd & Forni Rd

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	402	331	36	22	147
Future Volume (Veh/h)	88	402	331	36	22	147
Sign Control	Free	Free		Stop		
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	95	432	356	39	24	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	395			998	376	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	395			998	376	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	92			90	76	
cM capacity (veh/h)	1164			248	671	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	527	395	182			
Volume Left	95	0	24			
Volume Right	0	39	158			
cSH	1164	1700	548			
Volume to Capacity	0.08	0.23	0.33			
Queue Length 95th (ft)	7	0	36			
Control Delay (s)	2.3	0.0	14.8			
Lane LOS	A		B			
Approach Delay (s)	2.3	0.0	14.8			
Approach LOS			B			
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization	65.9%		ICU Level of Service		C	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
16: SR-49 & Pleasant Valley Rd

01/03/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↑	↑	↑	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	324	205	211	265	99	148
Future Volume (vph)	324	205	211	265	99	148
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	345	218	224	282	105	157
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total (vph)	563	224	282	262		
Volume Left (vph)	0	224	0	105		
Volume Right (vph)	218	0	0	157		
Hadj (s)	-0.20	0.53	0.03	-0.25		
Departure Headway (s)	5.4	6.6	6.1	6.2		
Degree Utilization, x	0.84	0.41	0.48	0.45		
Capacity (veh/h)	657	526	569	543		
Control Delay (s)	30.4	13.1	13.5	14.2		
Approach Delay (s)	30.4	13.3		14.2		
Approach LOS	D	B		B		
Intersection Summary						
Delay			20.7			
Level of Service			C			
Intersection Capacity Utilization		65.8%		ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Pleasant Valley Rd & China Garden Rd

01/03/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	890	583	45	9	15
Future Volume (Veh/h)	9	890	583	45	9	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	10	978	641	49	10	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	690			1664	666	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690			1664	666	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			91	97	
cM capacity (veh/h)	905			105	460	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	988	690	26			
Volume Left	10	0	10			
Volume Right	0	49	16			
cSH	905	1700	201			
Volume to Capacity	0.01	0.41	0.13			
Queue Length 95th (ft)	1	0	11			
Control Delay (s)	0.3	0.0	25.6			
Lane LOS	A		D			
Approach Delay (s)	0.3	0.0	25.6			
Approach LOS			D			
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		64.0%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

18: Pleasant Valley Rd & SR 49

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑	↑		↑	↑	↑	↑↑	
Traffic Volume (vph)	93	775	76	19	415	114	65	25	27	213	32	113
Future Volume (vph)	93	775	76	19	415	114	65	25	27	213	32	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.6		3.0	4.6	4.6		4.1	4.1	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.88
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3492		1770	1863	1583		1798	1583	1770	1617	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3492		1770	1863	1583		1798	1583	1770	1617	
Peak-hour factor, PHF	0.98	0.98	0.98	0.87	0.87	0.87	0.92	0.92	0.92	0.82	0.82	0.82
Adj. Flow (vph)	95	791	78	22	477	131	71	27	29	260	39	138
RTOR Reduction (vph)	0	5	0	0	0	56	0	0	26	0	81	0
Lane Group Flow (vph)	95	864	0	22	477	75	0	98	3	260	96	0
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases					2				4			
Actuated Green, G (s)	7.4	32.3		2.3	27.2	27.2		7.6	7.6	21.2	21.2	
Effective Green, g (s)	7.4	32.3		2.3	27.2	27.2		7.6	7.6	21.2	21.2	
Actuated g/C Ratio	0.09	0.41		0.03	0.35	0.35		0.10	0.10	0.27	0.27	
Clearance Time (s)	3.0	4.6		3.0	4.6	4.6		4.1	4.1	3.0	3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	167	1444		52	648	551		174	154	480	438	
v/s Ratio Prot	c0.05	0.25		0.01	c0.26			c0.05		c0.15	0.06	
v/s Ratio Perm					0.05				0.00			
v/c Ratio	0.57	0.60		0.42	0.74	0.14		0.56	0.02	0.54	0.22	
Uniform Delay, d ₁	33.8	17.8		37.2	22.3	17.4		33.7	31.9	24.3	22.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d ₂	2.6	0.4		2.0	3.8	0.0		2.5	0.0	0.7	0.1	
Delay (s)	36.5	18.3		39.3	26.1	17.5		36.1	31.9	25.0	22.1	
Level of Service	D	B		D	C	B		D	C	C	C	
Approach Delay (s)		20.1			24.7			35.2			23.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM 2000 Control Delay		23.1										C
HCM 2000 Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		78.1										14.7
Intersection Capacity Utilization		59.6%										B
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

19: Diamond Rd & Lime Kiln Rd/Black Rice Ln

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	9	35	6	3	2	40	212	20	20	357	50
Future Volume (Veh/h)	79	9	35	6	3	2	40	212	20	20	357	50
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	10	38	7	3	2	43	230	22	22	388	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	790	797	415	829	813	241	442			252		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	790	797	415	829	813	241	442			252		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	97	94	97	99	100	96			98		
cM capacity (veh/h)	292	302	637	255	296	798	1118			1313		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	12	295	464								
Volume Left	86	7	43	22								
Volume Right	38	2	22	54								
cSH	346	299	1118	1313								
Volume to Capacity	0.39	0.04	0.04	0.02								
Queue Length 95th (ft)	44	3	3	1								
Control Delay (s)	21.8	17.5	1.5	0.5								
Lane LOS	C	C	A	A								
Approach Delay (s)	21.8	17.5	1.5	0.5								
Approach LOS	C	C										
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization		43.7%			ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsigned Intersection Capacity Analysis

21: Diamond Rd & Bradley Dr

01/03/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	
Traffic Volume (veh/h)	17	32	29	264	395	8
Future Volume (Veh/h)	17	32	29	264	395	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.67	0.78	0.78	0.96	0.96
Hourly flow rate (vph)	25	48	37	338	411	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	827	415	419			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	827	415	419			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	92	97			
cM capacity (veh/h)	330	637	1140			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	73	37	338	419		
Volume Left	25	37	0	0		
Volume Right	48	0	0	8		
cSH	964	1140	1700	1700		
Volume to Capacity	0.08	0.03	0.20	0.25		
Queue Length 95th (ft)	6	3	0	0		
Control Delay (s)	13.1	8.3	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	13.1	0.8		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		34.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
22: US-50 WB On-ramp/US-50 WB Off-ramp & El Dorado Rd

01/03/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	82	0	38	98	160	0	0	88	53
Future Volume (Veh/h)	0	0	0	82	0	38	98	160	0	0	88	53
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.81	0.81	0.81	0.73	0.73	0.73	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	0	101	0	47	134	219	0	0	105	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	670	624	136	624	655	219	168			219		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	670	624	136	624	655	219	168			219		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	73	100	94	90			100		
cM capacity (veh/h)	324	364	912	369	349	821	1410			1350		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	148	353	168									
Volume Left	101	134	0									
Volume Right	47	0	63									
cSH	447	1410	1700									
Volume to Capacity	0.33	0.10	0.10									
Queue Length 95th (ft)	36	8	0									
Control Delay (s)	17.0	3.5	0.0									
Lane LOS	C	A										
Approach Delay (s)	17.0	3.5	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay		5.6										
Intersection Capacity Utilization		38.6%				ICU Level of Service			A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
23: El Dorado Rd & US-50 EB Off-ramp/US-50 EB On-ramp

01/03/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	0	113	0	0	0	0	152	95	43	127	0
Future Volume (Veh/h)	106	0	113	0	0	0	0	152	95	43	127	0
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.65	0.65	0.65	0.90	0.90	0.90
Hourly flow rate (vph)	123	0	131	0	0	0	0	234	146	48	141	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	544	617	141	675	544	307	141			380		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	544	617	141	675	544	307	141			380		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	100	86	100	100	100	100			96		
cM capacity (veh/h)	436	389	907	305	428	733	1442			1178		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	254	380	189									
Volume Left	123	0	48									
Volume Right	131	146	0									
cSH	595	1700	1178									
Volume to Capacity	0.43	0.22	0.04									
Queue Length 95th (ft)	53	0	3									
Control Delay (s)	15.5	0.0	2.3									
Lane LOS	C		A									
Approach Delay (s)	15.5	0.0	2.3									
Approach LOS	C											
Intersection Summary												
Average Delay		5.3										
Intersection Capacity Utilization		45.7%										
Analysis Period (min)		15										
ICU Level of Service												
A												

HCM Signalized Intersection Capacity Analysis

2035 AM Land Use 1

1: EI Dorado Rd & Missouri Flat Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑			↔			↔	
Traffic Volume (vph)	5	313	66	43	460	34	139	36	42	71	31	6
Future Volume (vph)	5	313	66	43	460	34	139	36	42	71	31	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			3.5			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.99			0.97			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.97	
Satd. Flow (prot)	1770	1814		1770	1843			1758			1789	
Flt Permitted	0.95	1.00		0.95	1.00			0.76			0.74	
Satd. Flow (perm)	1770	1814		1770	1843			1378			1363	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	340	72	47	500	37	151	39	46	77	34	7
RTOR Reduction (vph)	0	7	0	0	2	0	0	10	0	0	2	0
Lane Group Flow (vph)	5	405	0	47	535	0	0	226	0	0	116	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.0	38.4		4.3	41.7			15.3			15.3	
Effective Green, g (s)	1.0	38.4		4.3	41.7			15.3			15.3	
Actuated g/C Ratio	0.01	0.54		0.06	0.59			0.22			0.22	
Clearance Time (s)	4.0	5.0		4.0	5.0			3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.0			3.0	
Lane Grp Cap (vph)	25	988		107	1090			299			295	
v/s Ratio Prot	0.00	0.22		c0.03	c0.29							
v/s Ratio Perm								c0.16			0.08	
v/c Ratio	0.20	0.41		0.44	0.49			0.76			0.39	
Uniform Delay, d1	34.4	9.4		31.9	8.3			25.8			23.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.9	1.3		2.1	1.6			9.3			0.9	
Delay (s)	37.2	10.7		34.0	9.9			35.1			24.5	
Level of Service	D	B		C	A			D			C	
Approach Delay (s)		11.0			11.8			35.1			24.5	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			70.5				Sum of lost time (s)			12.5		
Intersection Capacity Utilization			54.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: Missouri Flat Rd & Headington Rd

2035 AM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↗	↖ ↗	↖ ↘	↖ ↙	↑ ↗	↑ ↘	↑ ↙	↖ ↗	↖ ↘	↖ ↙
Traffic Volume (vph)	24	0	181	15	0	36	294	488	21	41	361	47
Future Volume (vph)	24	0	181	15	0	36	294	488	21	41	361	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	0.99		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770		1583	1770	1583		1770	1851		1770	1830	
Flt Permitted	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770		1583	1770	1583		1770	1851		1770	1830	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	26	0	197	16	0	39	320	530	23	44	388	51
RTOR Reduction (vph)	0	0	179	0	37	0	0	1	0	0	3	0
Lane Group Flow (vph)	26	0	18	16	2	0	320	552	0	44	436	0
Turn Type	Prot		Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	4.4		9.4	1.5	6.5		22.1	67.6		3.3	48.8	
Effective Green, g (s)	4.4		9.4	1.5	6.5		22.1	67.6		3.3	48.8	
Actuated g/C Ratio	0.04		0.09	0.01	0.06		0.22	0.66		0.03	0.48	
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76		146	26	101		384	1229		57	877	
v/s Ratio Prot	c0.01			0.01	0.00		c0.18	0.30		0.02	c0.24	
v/s Ratio Perm		c0.01										
v/c Ratio	0.34		0.12	0.62	0.02		0.83	0.45		0.77	0.50	
Uniform Delay, d1	47.3		42.4	49.9	44.7		38.1	8.2		48.9	18.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7		0.4	36.3	0.1		14.3	1.2		46.8	2.0	
Delay (s)	50.0		42.8	86.1	44.8		52.4	9.4		95.7	20.1	
Level of Service	D		D	F	D		D	A		F	C	
Approach Delay (s)		43.6			56.8			25.2			27.0	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM 2000 Control Delay		29.3				HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio		0.55										
Actuated Cycle Length (s)		101.8				Sum of lost time (s)			20.0			
Intersection Capacity Utilization		58.6%				ICU Level of Service			B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2035 AM Land Use 1

3: Missouri Flat Rd & Plaza Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	3	87	227	19	61	114	706	301	47	498	25
Future Volume (vph)	22	3	87	227	19	61	114	706	301	47	498	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor	0.95	0.95	0.95	0.95			0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	0.99	0.98	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Fr _t	0.92	0.85	1.00	0.94			1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.98	1.00	0.95	0.98			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1573	1479	1681	1624			3433	3539	1583	1770	3512	
Flt Permitted	0.98	1.00	0.95	0.98			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1573	1479	1681	1624			3433	3539	1583	1770	3512	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	3	92	239	20	64	120	743	317	49	524	26
RTOR Reduction (vph)	0	32	55	0	29	0	0	0	136	0	3	0
Lane Group Flow (vph)	0	28	3	165	129	0	120	743	181	49	547	0
Confl. Peds. (#/hr)	2		1				1					2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7					6				
Actuated Green, G (s)	5.6	5.6	15.4	15.4			13.4	54.1	54.1	5.0	45.7	
Effective Green, g (s)	5.6	5.6	15.4	15.4			13.4	54.1	54.1	5.0	45.7	
Actuated g/C Ratio	0.06	0.06	0.16	0.16			0.14	0.57	0.57	0.05	0.48	
Clearance Time (s)	3.5	3.5	3.5	3.5			3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	92	87	272	263			484	2015	901	93	1689	
v/s Ratio Prot	c0.02		c0.10	0.08			0.03	c0.21		c0.03	0.16	
v/s Ratio Perm			0.00						0.11			
v/c Ratio	0.30	0.04	0.61	0.49			0.25	0.37	0.20	0.53	0.32	
Uniform Delay, d1	42.8	42.2	37.0	36.2			36.3	11.1	9.9	43.8	15.2	
Progression Factor	1.00	1.00	1.00	1.00			0.96	0.85	1.03	1.00	1.00	
Incremental Delay, d2	0.7	0.1	2.6	0.5			0.1	0.5	0.5	2.5	0.5	
Delay (s)	43.5	42.2	39.6	36.7			34.9	9.9	10.7	46.3	15.7	
Level of Service	D	D	D	D			C	A	B	D	B	
Approach Delay (s)	42.9			38.2				12.7			18.2	
Approach LOS		D		D				B			B	
Intersection Summary												
HCM 2000 Control Delay	19.5									B		
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	95.0								14.9			
Intersection Capacity Utilization	48.5%									A		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Missouri Flat Rd & US 50 WB Ramps

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	398	1	405	489	723	0	0	696	119
Future Volume (vph)	0	0	0	398	1	405	489	723	0	0	696	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1665	1669	2787	3433	3539			3539	1560
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1665	1669	2787	3433	3539			3539	1560
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	419	1	426	515	761	0	0	733	125
RTOR Reduction (vph)	0	0	0	0	0	265	0	0	0	0	0	63
Lane Group Flow (vph)	0	0	0	209	211	161	515	761	0	0	733	62
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				16.3	16.3	16.3	17.8	68.6			46.8	46.8
Effective Green, g (s)				16.3	16.3	16.3	17.8	68.6			46.8	46.8
Actuated g/C Ratio				0.17	0.17	0.17	0.19	0.72			0.49	0.49
Clearance Time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Vehicle Extension (s)				1.0	1.0	1.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)				285	286	478	643	2555			1743	768
v/s Ratio Prot				0.13	c0.13		c0.15	0.22			c0.21	
v/s Ratio Perm						0.06						0.04
v/c Ratio				0.73	0.74	0.34	0.80	0.30			0.42	0.08
Uniform Delay, d1				37.3	37.3	34.6	36.9	4.7			15.4	12.7
Progression Factor				1.00	1.00	1.00	1.05	1.47			1.18	2.61
Incremental Delay, d2				8.1	8.3	0.2	4.6	0.2			0.7	0.2
Delay (s)				45.4	45.6	34.7	43.5	7.1			19.0	33.4
Level of Service				D	D	C	D	A			B	C
Approach Delay (s)	0.0				40.1			21.8			21.1	
Approach LOS	A				D			C			C	
Intersection Summary												
HCM 2000 Control Delay	26.8										C	
HCM 2000 Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	95.0										14.1	
Intersection Capacity Utilization	56.8%										B	
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
5: Missouri Flat Rd & US 50 EB Ramps

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↔	↑					↑↑	↑	↑↑	↑↑	
Traffic Volume (vph)	150	0	564	0	0	0	0	1060	96	235	858	0
Future Volume (vph)	150	0	564	0	0	0	0	1060	96	235	858	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1						4.9	4.9	3.5	4.9
Lane Util. Factor	0.95	0.91	0.95						0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00						1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00						1.00	1.00	1.00	1.00
Fr _t	1.00	0.86	0.85						1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00						1.00	1.00	0.95	1.00
Satd. Flow (prot)	1681	1450	1504						3539	1562	3433	3539
Flt Permitted	0.95	1.00	1.00						1.00	1.00	0.95	1.00
Satd. Flow (perm)	1681	1450	1504						3539	1562	3433	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	0	594	0	0	0	0	1116	101	247	903	0
RTOR Reduction (vph)	0	142	142	0	0	0	0	0	39	0	0	0
Lane Group Flow (vph)	142	165	161	0	0	0	0	1116	62	247	903	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	16.1	16.1	16.1					41.4	41.4	25.0	69.9	
Effective Green, g (s)	16.1	16.1	16.1					41.4	41.4	25.0	69.9	
Actuated g/C Ratio	0.17	0.17	0.17					0.44	0.44	0.26	0.74	
Clearance Time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Vehicle Extension (s)	2.2	2.2	2.2					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	284	245	254					1542	680	903	2603	
v/s Ratio Prot	0.08	c0.11						c0.32		0.07	c0.26	
v/s Ratio Perm			0.11						0.04			
v/c Ratio	0.50	0.67	0.63					0.72	0.09	0.27	0.35	
Uniform Delay, d1	35.8	37.0	36.7					22.1	15.7	27.8	4.5	
Progression Factor	1.00	1.00	1.00					0.97	0.74	1.43	0.45	
Incremental Delay, d2	0.7	6.0	4.0					2.9	0.3	0.1	0.3	
Delay (s)	36.5	43.0	40.8					24.3	11.9	39.7	2.3	
Level of Service	D	D	D					C	B	D	A	
Approach Delay (s)		40.8			0.0			23.3			10.4	
Approach LOS		D			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			22.8		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			95.0		Sum of lost time (s)				12.5			
Intersection Capacity Utilization			56.8%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	140	56	50	983	1335	88
Future Volume (vph)	140	56	50	983	1335	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1568	1770	3539	3539	1547
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1568	1770	3539	3539	1547
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	59	53	1035	1405	93
RTOR Reduction (vph)	0	51	0	0	0	30
Lane Group Flow (vph)	147	8	53	1035	1405	63
Confl. Peds. (#/hr)						1
Confl. Bikes (#/hr)						2
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8			2	
Actuated Green, G (s)	12.3	12.3	6.4	73.8	63.4	63.4
Effective Green, g (s)	12.3	12.3	6.4	73.8	63.4	63.4
Actuated g/C Ratio	0.13	0.13	0.07	0.78	0.67	0.67
Clearance Time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0
Lane Grp Cap (vph)	444	203	119	2749	2361	1032
v/s Ratio Prot	c0.04		0.03	c0.29	c0.40	
v/s Ratio Perm		0.00			0.04	
v/c Ratio	0.33	0.04	0.45	0.38	0.60	0.06
Uniform Delay, d1	37.6	36.2	42.6	3.3	8.7	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.08	1.21
Incremental Delay, d2	0.2	0.0	1.0	0.4	1.0	0.1
Delay (s)	37.8	36.2	43.6	3.7	10.5	6.8
Level of Service	D	D	D	A	B	A
Approach Delay (s)	37.3			5.7	10.2	
Approach LOS	D			A	B	
Intersection Summary						
HCM 2000 Control Delay		10.5		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.55				
Actuated Cycle Length (s)		95.0		Sum of lost time (s)		12.9
Intersection Capacity Utilization		53.0%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

2035 AM Land Use 1

7: Missouri Flat Rd & Forni Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	219	67	6	63	36	146	15	1110	71	179	966	225
Future Volume (vph)	219	67	6	63	36	146	15	1110	71	179	966	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	*1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3539	1863	1583	1770	1863	1556	1770	3539	1451	1770	3539	1550
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3539	1863	1583	1770	1863	1556	1770	3539	1451	1770	3539	1550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	231	71	6	66	38	154	16	1168	75	188	1017	237
RTOR Reduction (vph)	0	0	5	0	0	141	0	0	41	0	0	52
Lane Group Flow (vph)	231	71	1	66	38	13	16	1168	34	188	1017	185
Confl. Bikes (#/hr)						2			1			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	11.7	12.9	12.9	7.1	8.3	8.3	2.2	44.9	44.9	16.0	58.7	58.7
Effective Green, g (s)	11.7	12.9	12.9	7.1	8.3	8.3	2.2	44.9	44.9	16.0	58.7	58.7
Actuated g/C Ratio	0.12	0.13	0.13	0.07	0.08	0.08	0.02	0.45	0.45	0.16	0.59	0.59
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	418	243	206	127	156	130	39	1606	658	286	2100	919
v/s Ratio Prot	c0.07	c0.04		0.04	0.02		0.01	c0.33		c0.11	0.29	
v/s Ratio Perm			0.00			0.01			0.02			0.12
v/c Ratio	0.55	0.29	0.00	0.52	0.24	0.10	0.41	0.73	0.05	0.66	0.48	0.20
Uniform Delay, d1	41.1	38.9	37.4	44.3	42.4	41.8	47.7	22.0	15.1	38.9	11.5	9.3
Progression 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
Incremental Delay, d2	0.9	0.2	0.0	1.5	0.3	0.1	2.5	1.7	0.0	4.1	0.2	0.1
Delay (s)	42.0	39.1	37.4	45.7	42.7	42.0	50.3	23.7	15.1	43.0	11.6	9.4
Level of Service	D	D	D	D	D	D	D	C	B	D	B	A
Approach Delay (s)		41.3			43.0			23.5			15.4	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.1									C
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			98.9									18.0
Intersection Capacity Utilization			65.2%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: Missouri Flat Rd & Golden Center Dr

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	5	61	35	5	8	120	1116	93	114	894	3
Future Volume (vph)	4	5	61	35	5	8	120	1116	93	114	894	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00				1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	0.99				1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00				1.00		1.00	1.00		1.00	1.00	1.00
Fr _t	0.88				0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	1.00				0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1617				1745		1770	3493		1770	3539	1534
Flt Permitted	0.98				0.84		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1596				1516		1770	3493		1770	3539	1534
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	4	5	66	36	5	8	129	1200	100	123	961	3
RTOR Reduction (vph)	0	58	0	0	7	0	0	5	0	0	0	1
Lane Group Flow (vph)	0	17	0	0	42	0	129	1295	0	123	961	2
Confl. Peds. (#/hr)												7
Confl. Bikes (#/hr)				1					2			
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	7.7			7.7			8.2	34.7		8.1	34.6	34.6
Effective Green, g (s)	7.7			7.7			8.2	34.7		8.1	34.6	34.6
Actuated g/C Ratio	0.12			0.12			0.13	0.55		0.13	0.54	0.54
Clearance Time (s)	4.0			4.0			4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	193			183			228	1908		225	1928	835
v/s Ratio Prot						c0.07	c0.37		0.07	0.27		
v/s Ratio Perm	0.01			c0.03								0.00
v/c Ratio	0.09			0.23			0.57	0.68		0.55	0.50	0.00
Uniform Delay, d1	24.8			25.2			26.0	10.4		26.0	9.0	6.6
Progression Factor	1.00			1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2			0.6			3.2	1.0		2.7	0.2	0.0
Delay (s)	25.0			25.9			29.2	11.4		28.7	9.2	6.6
Level of Service	C			C			C	B		C	A	A
Approach Delay (s)	25.0			25.9				13.0			11.4	
Approach LOS	C			C				B			B	
Intersection Summary												
HCM 2000 Control Delay	12.9				HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	63.5				Sum of lost time (s)			13.0				
Intersection Capacity Utilization	60.3%				ICU Level of Service			B				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
9: Missouri Flat Rd & Diamond Springs Parkway

2035 AM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑		↔	
Traffic Volume (vph)	10	356	661	126	631	10	770	10	25	10	10	10
Future Volume (vph)	10	356	661	126	631	10	770	10	25	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1664			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1664			1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	387	718	137	686	11	837	11	27	11	11	11
RTOR Reduction (vph)	0	0	291	0	0	7	0	18	0	0	10	0
Lane Group Flow (vph)	11	387	427	137	686	4	837	20	0	0	23	0
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2	28	1	6		8	8		4	4	
Permitted Phases						6						
Actuated Green, G (s)	0.6	20.8	46.5	5.3	25.5	25.5	25.7	25.7			6.4	
Effective Green, g (s)	0.6	20.8	46.5	5.3	25.5	25.5	25.7	25.7			6.4	
Actuated g/C Ratio	0.01	0.27	0.59	0.07	0.33	0.33	0.33	0.33			0.08	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	13	941	941	119	1154	516	1128	546			143	
v/s Ratio Prot	0.01	0.11	0.27	c0.08	c0.19		c0.24	0.01			c0.01	
v/s Ratio Perm						0.00						
v/c Ratio	0.85	0.41	0.45	1.15	0.59	0.01	0.74	0.04			0.16	
Uniform Delay, d1	38.8	23.7	8.8	36.5	22.0	17.8	23.3	17.8			33.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	166.4	0.3	0.3	128.9	0.8	0.0	2.7	0.0			0.5	
Delay (s)	205.2	23.9	9.1	165.3	22.9	17.8	26.0	17.9			33.9	
Level of Service	F	C	A	F	C	B	C	B			C	
Approach Delay (s)		16.2			46.2			25.6			33.9	
Approach LOS		B			D			C			C	
Intersection Summary												
HCM 2000 Control Delay				28.0							C	
HCM 2000 Volume to Capacity ratio				0.67								
Actuated Cycle Length (s)				78.2							20.0	
Intersection Capacity Utilization				63.7%							B	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
10: China Garden Rd & Missouri Flat Rd

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	4	0	14	0	918	11	24	743	0
Future Volume (Veh/h)	1	0	0	4	0	14	0	918	11	24	743	0
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Hourly flow rate (vph)	1	0	0	4	0	15	0	998	12	25	774	0
Pedestrians												1
Lane Width (ft)												12.0
Walking Speed (ft/s)												4.0
Percent Blockage												0
Right turn flare (veh)												
Median type								TWLTL				None
Median storage veh)									2			
Upstream signal (ft)												663
pX, platoon unblocked												
vC, conflicting volume	1844	1834	774	1828	1828	1005	774					1010
vC1, stage 1 conf vol	824	824		1004	1004							
vC2, stage 2 conf vol	1020	1010		824	824							
vCu, unblocked vol	1844	1834	774	1828	1828	1005	774					1010
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	100	100	100	98	100	95	100					96
cM capacity (veh/h)	202	235	398	225	247	293	842					678
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	1	19	1010	25	774							
Volume Left	1	4	0	25	0							
Volume Right	0	15	12	0	0							
cSH	202	276	842	678	1700							
Volume to Capacity	0.00	0.07	0.00	0.04	0.46							
Queue Length 95th (ft)	0	6	0	3	0							
Control Delay (s)	22.9	19.0	0.0	10.5	0.0							
Lane LOS	C	C		B								
Approach Delay (s)	22.9	19.0	0.0	0.3								
Approach LOS	C	C										
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization		59.3%		ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
11: Missouri Flat Road & Industrial Dr

2035 AM Land Use 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	Y	Y	
Traffic Volume (veh/h)	5	30	88	908	693	190
Future Volume (Veh/h)	5	30	88	908	693	190
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	33	96	987	753	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2036	856	960			
vC1, stage 1 conf vol	856					
vC2, stage 2 conf vol	1179					
vCu, unblocked vol	2036	856	960			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	91	87			
cM capacity (veh/h)	215	357	717			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	38	96	987	960		
Volume Left	5	96	0	0		
Volume Right	33	0	0	207		
cSH	329	717	1700	1700		
Volume to Capacity	0.12	0.13	0.58	0.56		
Queue Length 95th (ft)	10	12	0	0		
Control Delay (s)	17.4	10.8	0.0	0.0		
Lane LOS	C	B				
Approach Delay (s)	17.4	1.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		66.2%		ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
12: Missouri Flat Road & Enterprise Dr

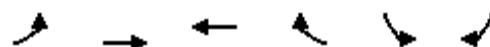
2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	0	13	1	0	4	17	837	6	4	519	140
Future Volume (Veh/h)	79	0	13	1	0	4	17	837	6	4	519	140
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	84	0	14	1	0	4	18	890	6	4	552	149
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)									2			2
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1564	1566	626	1503	1638	893	701				896	
vC1, stage 1 conf vol	634	634			929	929						
vC2, stage 2 conf vol	930	932			574	709						
vCu, unblocked vol	1564	1566	626	1503	1638	893	701				896	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	68	100	97	100	100	99	98				99	
cM capacity (veh/h)	262	284	484	269	273	340	896				753	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	98	5	18	896	4	701						
Volume Left	84	1	18	0	4	0						
Volume Right	14	4	0	6	0	149						
cSH	280	323	896	1700	753	1700						
Volume to Capacity	0.35	0.02	0.02	0.53	0.01	0.41						
Queue Length 95th (ft)	38	1	2	0	0	0						
Control Delay (s)	24.6	16.3	9.1	0.0	9.8	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	24.6	16.3	0.2		0.1							
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization		62.9%			ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
13: Pleasant Valley Rd & Missouri Flat Rd

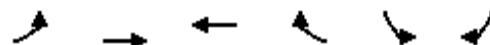
2035 AM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	411	220	381	419	209	281
Future Volume (vph)	411	220	381	419	209	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1863	1863	1583	1770	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1863	1863	1583	1770	1553
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	437	234	414	455	227	305
RTOR Reduction (vph)	0	0	0	43	0	129
Lane Group Flow (vph)	437	234	414	412	227	176
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	7	7	5
Permitted Phases				6		4
Actuated Green, G (s)	13.1	36.0	18.9	32.1	13.2	26.3
Effective Green, g (s)	13.1	36.0	18.9	32.1	13.2	26.3
Actuated g/C Ratio	0.23	0.62	0.33	0.55	0.23	0.45
Clearance Time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	776	1158	608	877	403	705
v/s Ratio Prot	c0.13	0.13	c0.22	0.11	c0.13	0.06
v/s Ratio Perm				0.15		0.06
v/c Ratio	0.56	0.20	0.68	0.47	0.56	0.25
Uniform Delay, d1	19.9	4.7	16.9	7.8	19.8	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0	2.5	0.1	1.1	0.1
Delay (s)	20.4	4.8	19.4	7.9	20.9	9.8
Level of Service	C	A	B	A	C	A
Approach Delay (s)		15.0	13.4		14.5	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay		14.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		57.9		Sum of lost time (s)		12.7
Intersection Capacity Utilization		53.9%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
14: Pleasant Valley Rd & Commerce Way

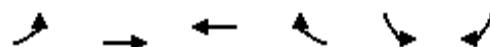
2035 AM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	635	608	54	10	21
Future Volume (Veh/h)	35	635	608	54	10	21
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	690	661	59	11	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	TWLTL				
Median storage veh		2				
Upstream signal (ft)		750				
pX, platoon unblocked	0.83			0.83	0.83	
vC, conflicting volume	720			1427	661	
vC1, stage 1 conf vol				661		
vC2, stage 2 conf vol				766		
vCu, unblocked vol	565			1412	494	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	95			97	95	
cM capacity (veh/h)	840			345	480	
Direction, Lane #	EB 1	WB 1	WB 2	SB 1		
Volume Total	728	661	59	34		
Volume Left	38	0	0	11		
Volume Right	0	0	59	23		
cSH	840	1700	1700	426		
Volume to Capacity	0.05	0.39	0.03	0.08		
Queue Length 95th (ft)	4	0	0	6		
Control Delay (s)	1.2	0.0	0.0	14.2		
Lane LOS	A		B			
Approach Delay (s)	1.2	0.0		14.2		
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		72.0%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
15: Pleasant Valley Rd & Forni Rd

2035 AM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	146	435	432	38	52	103
Future Volume (Veh/h)	146	435	432	38	52	103
Sign Control	Free	Free		Stop		
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	195	580	576	51	69	137
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	627			1572	602	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	627			1572	602	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	80			29	73	
cM capacity (veh/h)	955			97	500	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	775	627	206			
Volume Left	195	0	69			
Volume Right	0	51	137			
cSH	955	1700	209			
Volume to Capacity	0.20	0.37	0.99			
Queue Length 95th (ft)	19	0	216			
Control Delay (s)	4.7	0.0	107.2			
Lane LOS	A		F			
Approach Delay (s)	4.7	0.0	107.2			
Approach LOS			F			
Intersection Summary						
Average Delay		16.0				
Intersection Capacity Utilization	75.2%		ICU Level of Service		D	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
16: SR-49 & Pleasant Valley Rd

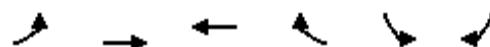
2035 AM Land Use 1



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↓	↑	↑	↑	↑
Sign Control	Stop		Stop	Stop		
Traffic Volume (vph)	319	108	176	366	292	281
Future Volume (vph)	319	108	176	366	292	281
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	339	115	187	389	311	299
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total (vph)	454	187	389	610		
Volume Left (vph)	0	187	0	311		
Volume Right (vph)	115	0	0	299		
Hadj (s)	-0.12	0.53	0.03	-0.16		
Departure Headway (s)	6.8	7.9	7.4	6.6		
Degree Utilization, x	0.86	0.41	0.80	1.12		
Capacity (veh/h)	524	447	476	550		
Control Delay (s)	38.3	15.2	33.4	98.8		
Approach Delay (s)	38.3	27.5		98.8		
Approach LOS	E	D		F		
Intersection Summary						
Delay				57.0		
Level of Service				F		
Intersection Capacity Utilization			76.5%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
17: Pleasant Valley Rd & China Garden Rd

2035 AM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	438	723	50	3	9
Future Volume (Veh/h)	12	438	723	50	3	9
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	476	786	54	3	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	840			1315	813	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840			1315	813	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			98	97	
cM capacity (veh/h)	795			171	378	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	489	840	13			
Volume Left	13	0	3			
Volume Right	0	54	10			
cSH	795	1700	296			
Volume to Capacity	0.02	0.49	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	0.5	0.0	17.7			
Lane LOS	A		C			
Approach Delay (s)	0.5	0.0	17.7			
Approach LOS			C			
Intersection Summary						
Average Delay		0.3				
Intersection Capacity Utilization		51.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

2035 AM Land Use 1

18: Pleasant Valley Rd & SR 49

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑	↑↑	↑	↑		↑↑	↑	
Traffic Volume (vph)	119	139	17	31	372	608	14	115	14	274	52	94
Future Volume (vph)	119	139	17	31	372	608	14	115	14	274	52	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.6		3.0	4.6	4.6	3.0	4.6		3.5	4.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	0.88	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Fr _t	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3482		1770	1863	2787	1770	1833		3433	1660	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3482		1770	1863	2787	1770	1833		3433	1660	
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	142	17	34	404	661	15	125	15	298	57	102
RTOR Reduction (vph)	0	8	0	0	0	0	0	6	0	0	71	0
Lane Group Flow (vph)	121	151	0	34	404	661	15	134	0	298	88	0
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	8.3	28.8		2.2	22.7	22.7	1.1	10.1		11.3	20.8	
Effective Green, g (s)	8.3	28.8		2.2	22.7	22.7	1.1	10.1		11.3	20.8	
Actuated g/C Ratio	0.12	0.42		0.03	0.33	0.33	0.02	0.15		0.17	0.31	
Clearance Time (s)	3.0	4.6		3.0	4.6	4.6	3.0	4.6		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	215	1472		57	621	929	28	271		569	507	
v/s Ratio Prot	c0.07	0.04		0.02	0.22		0.01	c0.07		c0.09	0.05	
v/s Ratio Perm						c0.24						
v/c Ratio	0.56	0.10		0.60	0.65	0.71	0.54	0.49		0.52	0.17	
Uniform Delay, d1	28.2	11.9		32.5	19.3	19.8	33.2	26.7		25.9	17.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.0		10.7	1.9	2.2	9.5	0.5		0.9	0.1	
Delay (s)	30.2	11.9		43.2	21.2	22.0	42.8	27.2		26.8	17.4	
Level of Service	C	B		D	C	C	D	C		C	B	
Approach Delay (s)		19.8			22.4			28.7			23.5	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		22.8			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		68.1			Sum of lost time (s)				15.7			
Intersection Capacity Utilization		55.2%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
19: Diamond Rd & Lime Kiln Rd/Black Rice Ln

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	26	0	0	189	31	590	65	122	479	14
Future Volume (Veh/h)	0	0	26	0	0	189	31	590	65	122	479	14
Sign Control	Stop			Stop			Free			Free		
Grade		0%			0%			0%		0%		0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	28	0	0	205	34	641	71	133	521	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh)												
Upstream signal (ft)											571	
pX, platoon unblocked												
vC, conflicting volume	1388	1574	268	1299	1546	356	536			712		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1388	1574	268	1299	1546	356	536			712		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	68	97			85		
cM capacity (veh/h)	60	89	730	99	93	640	1028			884		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	28	205	34	427	285	133	347	189				
Volume Left	0	0	34	0	0	133	0	0				
Volume Right	28	205	0	0	71	0	0	15				
cSH	730	640	1028	1700	1700	884	1700	1700				
Volume to Capacity	0.04	0.32	0.03	0.25	0.17	0.15	0.20	0.11				
Queue Length 95th (ft)	3	34	3	0	0	13	0	0				
Control Delay (s)	10.1	13.2	8.6	0.0	0.0	9.8	0.0	0.0				
Lane LOS	B	B	A			A						
Approach Delay (s)	10.1	13.2	0.4			1.9						
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization		36.7%				ICU Level of Service				A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
20: Diamond Rd & Diamond Springs Parkway

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑		↑	↑	↑	↑		↑	↑	↑
Traffic Volume (vph)	60	26	368	18	35	16	783	164	23	18	213	171
Future Volume (vph)	60	26	368	18	35	16	783	164	23	18	213	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583		1831	1583	3433	1828		1770	1863	1583
Flt Permitted	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583		1831	1583	3433	1828		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	28	400	20	38	17	851	178	25	20	232	186
RTOR Reduction (vph)	0	0	245	0	0	16	0	3	0	0	0	139
Lane Group Flow (vph)	65	28	155	0	58	1	851	200	0	20	232	47
Turn Type	Split	NA	pt+ov	Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	4	4	4 5	8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	8.5	8.5	28.1		6.0	6.0	19.6	37.0		0.8	18.2	18.2
Effective Green, g (s)	8.5	8.5	28.1		6.0	6.0	19.6	37.0		0.8	18.2	18.2
Actuated g/C Ratio	0.12	0.12	0.39		0.08	0.08	0.27	0.51		0.01	0.25	0.25
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	208	219	615		151	131	930	935		19	468	398
v/s Ratio Prot	c0.04	0.02	0.10		c0.03		c0.25	0.11		0.01	c0.12	
v/s Ratio Perm						0.00						0.03
v/c Ratio	0.31	0.13	0.25		0.38	0.01	0.92	0.21		1.05	0.50	0.12
Uniform Delay, d1	29.2	28.6	15.0		31.4	30.4	25.5	9.7		35.8	23.1	20.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.3	0.2		1.6	0.0	13.3	0.1		224.0	0.8	0.1
Delay (s)	30.1	28.8	15.2		33.0	30.5	38.8	9.8		259.8	24.0	21.0
Level of Service	C	C	B		C	C	D	A		F	C	C
Approach Delay (s)		17.9			32.4			33.2			33.5	
Approach LOS		B			C			C			C	

Intersection Summary

HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
21: Diamond Rd & Bradley Dr

2035 AM Land Use 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (veh/h)	47	0	1	231	402	95
Future Volume (Veh/h)	47	0	1	231	402	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Hourly flow rate (vph)	51	0	1	251	419	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh						
Upstream signal (ft)				389		
pX, platoon unblocked	0.97					
vC, conflicting volume	722	468	518			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	700	468	518			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	100	100			
cM capacity (veh/h)	394	595	1048			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	51	1	251	518		
Volume Left	51	1	0	0		
Volume Right	0	0	0	99		
cSH	389	1048	1700	1700		
Volume to Capacity	0.13	0.00	0.15	0.30		
Queue Length 95th (ft)	11	0	0	0		
Control Delay (s)	15.7	8.4	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	15.7	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		36.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
22: US-50 WB On-ramp/US-50 WB Off-ramp & El Dorado Rd

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	0	32	124	351	0	0	83	155
Future Volume (Veh/h)	0	0	0	150	0	32	124	351	0	0	83	155
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	163	0	35	135	382	0	0	90	168
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	861	826	174	826	910	382	258			382		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	861	826	174	826	910	382	258			382		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	39	100	95	90			100		
cM capacity (veh/h)	241	276	869	268	246	665	1307			1176		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	198	517	258									
Volume Left	163	135	0									
Volume Right	35	0	168									
cSH	300	1307	1700									
Volume to Capacity	0.66	0.10	0.15									
Queue Length 95th (ft)	109	9	0									
Control Delay (s)	37.6	2.9	0.0									
Lane LOS	E	A										
Approach Delay (s)	37.6	2.9	0.0									
Approach LOS	E											
Intersection Summary												
Average Delay		9.2										
Intersection Capacity Utilization		59.5%										
Analysis Period (min)		15										
ICU Level of Service								B				

HCM Unsignalized Intersection Capacity Analysis
23: El Dorado Rd & US-50 EB Off-ramp/US-50 EB On-ramp

2035 AM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	2	119	0	0	0	0	280	132	29	204	0
Future Volume (Veh/h)	196	2	119	0	0	0	0	280	132	29	204	0
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	213	2	129	0	0	0	0	304	143	32	222	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	662	733	222	792	662	376	222				447	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	662	733	222	792	662	376	222				447	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	42	99	84	100	100	100	100				97	
cM capacity (veh/h)	367	338	818	252	371	671	1347				1113	
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	344	447	254									
Volume Left	213	0	32									
Volume Right	129	143	0									
cSH	463	1700	1113									
Volume to Capacity	0.74	0.26	0.03									
Queue Length 95th (ft)	154	0	2									
Control Delay (s)	32.1	0.0	1.3									
Lane LOS	D		A									
Approach Delay (s)	32.1	0.0	1.3									
Approach LOS	D											
Intersection Summary												
Average Delay		10.9										
Intersection Capacity Utilization	60.1%		ICU Level of Service					B				
Analysis Period (min)		15										

HCM Signalized Intersection Capacity Analysis

1: EI Dorado Rd & Missouri Flat Rd

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑			↔			↔	
Traffic Volume (vph)	10	256	44	63	365	179	51	59	76	86	36	9
Future Volume (vph)	10	256	44	63	365	179	51	59	76	86	36	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0				3.5		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.95			0.94			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1822		1770	1771				1736		1787	
Flt Permitted	0.95	1.00		0.95	1.00			0.90			0.60	
Satd. Flow (perm)	1770	1822		1770	1771			1583			1103	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	278	48	68	397	195	55	64	83	93	39	10
RTOR Reduction (vph)	0	5	0	0	12	0	0	30	0	0	3	0
Lane Group Flow (vph)	11	321	0	68	580	0	0	172	0	0	139	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.1	38.6		4.9	42.4			13.5			13.5	
Effective Green, g (s)	1.1	38.6		4.9	42.4			13.5			13.5	
Actuated g/C Ratio	0.02	0.56		0.07	0.61			0.19			0.19	
Clearance Time (s)	4.0	5.0		4.0	5.0			3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.0			3.0	
Lane Grp Cap (vph)	28	1011		124	1080			307			214	
v/s Ratio Prot	0.01	0.18		c0.04	c0.33							
v/s Ratio Perm								0.11			c0.13	
v/c Ratio	0.39	0.32		0.55	0.54			0.56			0.65	
Uniform Delay, d1	33.9	8.3		31.2	7.9			25.3			25.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.5	0.8		3.9	1.9			1.4			6.6	
Delay (s)	40.4	9.2		35.1	9.8			26.7			32.4	
Level of Service	D	A		D	A			C			C	
Approach Delay (s)		10.2			12.4			26.7			32.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		16.1				HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		69.5			Sum of lost time (s)			12.5				
Intersection Capacity Utilization		59.6%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: Missouri Flat Rd & Headington Rd

2035 PM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↖ ↗	↖ ↘	↖ ↙	↑ ↗	↑ ↘	↑ ↙	↑ ↗	↑ ↘	↑ ↙
Traffic Volume (vph)	77	0	391	26	0	59	317	487	12	29	364	45
Future Volume (vph)	77	0	391	26	0	59	317	487	12	29	364	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770		1583	1770	1583		1770	1856		1770	1832	
Flt Permitted	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770		1583	1770	1583		1770	1856		1770	1832	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	84	0	425	28	0	64	345	529	13	31	391	48
RTOR Reduction (vph)	0	0	377	0	60	0	0	1	0	0	3	0
Lane Group Flow (vph)	84	0	48	28	4	0	345	541	0	31	436	0
Turn Type	Prot		Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.8		12.1	2.3	6.6		24.1	68.5		3.4	47.8	
Effective Green, g (s)	7.8		12.1	2.3	6.6		24.1	68.5		3.4	47.8	
Actuated g/C Ratio	0.07		0.11	0.02	0.06		0.23	0.64		0.03	0.45	
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129		180	38	98		401	1196		56	823	
v/s Ratio Prot	c0.05			0.02	0.00		c0.19	0.29		0.02	c0.24	
v/s Ratio Perm			c0.03									
v/c Ratio	0.65		0.27	0.74	0.04		0.86	0.45		0.55	0.53	
Uniform Delay, d1	47.9		43.1	51.7	46.9		39.5	9.5		50.7	21.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.2		0.8	53.2	0.2		16.9	1.2		11.3	2.4	
Delay (s)	59.1		43.9	104.9	47.0		56.4	10.7		62.0	23.6	
Level of Service	E		D	F	D		E	B		E	C	
Approach Delay (s)		46.4			64.7			28.5			26.1	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM 2000 Control Delay		34.3				HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		106.3				Sum of lost time (s)			20.0			
Intersection Capacity Utilization		62.9%				ICU Level of Service			B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2035 PM Land Use 1

3: Missouri Flat Rd & Plaza Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	44	357	437	36	71	347	622	417	68	714	61
Future Volume (vph)	73	44	357	437	36	71	347	622	417	68	714	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor	0.95	0.95	0.95	0.95			0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	0.99	0.99	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	
Fr	0.92	0.85	1.00	0.96			1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.99	1.00	0.95	0.97			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1595	1484	1681	1650			3433	3539	1583	1770	3493	
Flt Permitted	0.99	1.00	0.95	0.97			0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1595	1484	1681	1650			3433	3539	1583	1770	3493	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	77	46	376	460	38	75	365	655	439	72	752	64
RTOR Reduction (vph)	0	46	198	0	15	0	0	0	273	0	5	0
Lane Group Flow (vph)	0	212	43	290	268	0	365	655	166	72	811	0
Confl. Peds. (#/hr)	2		1				1					2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7					6				
Actuated Green, G (s)	17.0	17.0	20.2	20.2			12.6	36.0	36.0	6.9	30.3	
Effective Green, g (s)	17.0	17.0	20.2	20.2			12.6	36.0	36.0	6.9	30.3	
Actuated g/C Ratio	0.18	0.18	0.21	0.21			0.13	0.38	0.38	0.07	0.32	
Clearance Time (s)	3.5	3.5	3.5	3.5			3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	285	265	357	350			455	1341	599	128	1114	
v/s Ratio Prot	c0.13		c0.17	0.16			c0.11	0.19		0.04	c0.23	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	0.74	0.16	0.81	0.77			0.80	0.49	0.28	0.56	0.73	
Uniform Delay, d1	36.9	33.0	35.6	35.2			40.0	22.5	20.5	42.6	28.7	
Progression Factor	1.00	1.00	1.00	1.00			0.98	1.03	2.18	1.00	1.00	
Incremental Delay, d2	8.9	0.1	12.5	8.7			8.6	1.2	1.1	3.3	4.2	
Delay (s)	45.8	33.1	48.1	43.9			47.7	24.4	45.7	45.9	32.9	
Level of Service	D	C	D	D			D	C	D	D	C	
Approach Delay (s)	39.7			46.0				36.7			33.9	
Approach LOS		D		D				D			C	
Intersection Summary												
HCM 2000 Control Delay	38.0									D		
HCM 2000 Volume to Capacity ratio	0.76											
Actuated Cycle Length (s)	95.0									14.9		
Intersection Capacity Utilization	74.2%									D		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Missouri Flat Rd & US 50 WB Ramps

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑↑	↑↑	↑↑			↑↑	↑
Traffic Volume (vph)	0	0	0	594	0	513	572	872	0	0	1285	223
Future Volume (vph)	0	0	0	594	0	513	572	872	0	0	1285	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1665	1665	2787	3433	3539			3539	1560
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1665	1665	2787	3433	3539			3539	1560
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	625	0	540	602	918	0	0	1353	235
RTOR Reduction (vph)	0	0	0	0	0	165	0	0	0	0	0	141
Lane Group Flow (vph)	0	0	0	312	313	375	602	918	0	0	1353	94
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				23.0	23.0	23.0	20.1	61.9			37.8	37.8
Effective Green, g (s)				23.0	23.0	23.0	20.1	61.9			37.8	37.8
Actuated g/C Ratio				0.24	0.24	0.24	0.21	0.65			0.40	0.40
Clearance Time (s)				5.1	5.1	5.1	4.0	5.0			5.0	5.0
Vehicle Extension (s)				1.0	1.0	1.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)				403	403	674	726	2305			1408	620
v/s Ratio Prot				0.19	c0.19		c0.18	0.26			c0.38	
v/s Ratio Perm						0.13						0.06
v/c Ratio				0.77	0.78	0.56	0.83	0.40			0.96	0.15
Uniform Delay, d1				33.6	33.6	31.5	35.8	7.8			27.9	18.3
Progression Factor				1.00	1.00	1.00	1.11	1.66			1.22	2.75
Incremental Delay, d2				8.2	8.3	0.6	0.7	0.2			13.6	0.4
Delay (s)				41.8	41.9	32.1	40.6	13.1			47.7	50.8
Level of Service				D	D	C	D	B			D	D
Approach Delay (s)	0.0				37.3			24.0			48.2	
Approach LOS	A				D			C			D	
Intersection Summary												
HCM 2000 Control Delay	36.6				HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	95.0				Sum of lost time (s)			14.1				
Intersection Capacity Utilization	80.0%				ICU Level of Service			D				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
5: Missouri Flat Rd & US 50 EB Ramps

2035 PM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↔	↑					↑↑	↑	↑↑	↑↑	
Traffic Volume (vph)	199	4	757	0	0	0	0	1245	149	502	1377	0
Future Volume (vph)	199	4	757	0	0	0	0	1245	149	502	1377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Fr _t	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1452	1504					3539	1561	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1452	1504					3539	1561	3433	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	209	4	797	0	0	0	0	1311	157	528	1449	0
RTOR Reduction (vph)	0	39	57	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	188	377	349	0	0	0	0	1311	112	528	1449	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)												2
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	25.0	25.0	25.0					32.5	32.5	25.0	61.0	
Effective Green, g (s)	25.0	25.0	25.0					32.5	32.5	25.0	61.0	
Actuated g/C Ratio	0.26	0.26	0.26					0.34	0.34	0.26	0.64	
Clearance Time (s)	4.1	4.1	4.1					4.9	4.9	3.5	4.9	
Vehicle Extension (s)	2.2	2.2	2.2					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	442	382	395					1210	534	903	2272	
v/s Ratio Prot	0.11	c0.26						c0.37		0.15	c0.41	
v/s Ratio Perm			0.23						0.07			
v/c Ratio	0.43	0.99	0.88					1.08	0.21	0.58	0.64	
Uniform Delay, d1	29.0	34.8	33.6					31.2	22.1	30.5	10.3	
Progression Factor	1.00	1.00	1.00					1.00	0.88	1.20	0.30	
Incremental Delay, d2	0.3	42.1	19.7					51.1	0.8	0.2	0.8	
Delay (s)	29.4	76.9	53.3					82.3	20.3	36.8	3.9	
Level of Service	C	E	D					F	C	D	A	
Approach Delay (s)		58.6			0.0			75.6			12.7	
Approach LOS		E			A			E			B	
Intersection Summary												
HCM 2000 Control Delay		43.8		HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		95.0		Sum of lost time (s)					12.5			
Intersection Capacity Utilization		80.0%		ICU Level of Service					D			
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	187	74	73	1092	1893	241
Future Volume (vph)	187	74	73	1092	1893	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1568	1770	3539	3539	1547
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1568	1770	3539	3539	1547
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	78	77	1149	1993	254
RTOR Reduction (vph)	0	67	0	0	0	62
Lane Group Flow (vph)	197	11	77	1149	1993	192
Confl. Peds. (#/hr)						1
Confl. Bikes (#/hr)						2
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8			2	
Actuated Green, G (s)	13.3	13.3	7.5	72.8	61.3	61.3
Effective Green, g (s)	13.3	13.3	7.5	72.8	61.3	61.3
Actuated g/C Ratio	0.14	0.14	0.08	0.77	0.65	0.65
Clearance Time (s)	4.0	4.0	4.0	4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0
Lane Grp Cap (vph)	480	219	139	2711	2283	998
v/s Ratio Prot	c0.06		c0.04	0.32	c0.56	
v/s Ratio Perm		0.01			0.12	
v/c Ratio	0.41	0.05	0.55	0.42	0.87	0.19
Uniform Delay, d1	37.3	35.4	42.1	3.8	13.7	6.8
Progression Factor	1.00	1.00	1.00	1.00	0.92	0.90
Incremental Delay, d2	0.2	0.0	2.7	0.5	3.3	0.3
Delay (s)	37.5	35.4	44.8	4.3	15.9	6.4
Level of Service	D	D	D	A	B	A
Approach Delay (s)	36.9			6.9	14.9	
Approach LOS	D			A	B	
Intersection Summary						
HCM 2000 Control Delay		13.9		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		95.0		Sum of lost time (s)		12.9
Intersection Capacity Utilization		72.5%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

2035 PM Land Use 1

7: Missouri Flat Rd & Forni Rd

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	484	25	14	48	37	146	23	1092	34	135	1475	346
Future Volume (vph)	484	25	14	48	37	146	23	1092	34	135	1475	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	*1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3539	1863	1583	1770	1863	1556	1770	3539	1451	1770	3539	1549
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3539	1863	1583	1770	1863	1556	1770	3539	1451	1770	3539	1549
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	509	26	15	51	39	154	24	1149	36	142	1553	364
RTOR Reduction (vph)	0	0	13	0	0	141	0	0	20	0	0	59
Lane Group Flow (vph)	509	26	2	51	39	13	24	1149	16	142	1553	305
Confl. Bikes (#/hr)						2			1			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	19.2	16.6	16.6	11.8	9.2	9.2	3.9	49.1	49.1	13.3	58.5	58.5
Effective Green, g (s)	19.2	16.6	16.6	11.8	9.2	9.2	3.9	49.1	49.1	13.3	58.5	58.5
Actuated g/C Ratio	0.18	0.15	0.15	0.11	0.08	0.08	0.04	0.45	0.45	0.12	0.54	0.54
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	624	284	241	191	157	131	63	1597	654	216	1902	832
v/s Ratio Prot	c0.14	0.01		0.03	c0.02		0.01	0.32		c0.08	c0.44	
v/s Ratio Perm			0.00			0.01			0.01			0.20
v/c Ratio	0.82	0.09	0.01	0.27	0.25	0.10	0.38	0.72	0.02	0.66	0.82	0.37
Uniform Delay, d1	43.1	39.6	39.1	44.5	46.6	46.0	51.3	24.3	16.6	45.6	20.7	14.5
Progression 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
Incremental Delay, d2	7.7	0.1	0.0	0.3	0.3	0.1	1.4	1.6	0.0	5.4	2.8	0.3
Delay (s)	50.8	39.7	39.1	44.8	46.9	46.1	52.7	25.8	16.6	51.0	23.6	14.8
Level of Service	D	D	D	D	D	D	D	C	B	D	C	B
Approach Delay (s)		49.9			46.0			26.1			23.9	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		29.4										C
HCM 2000 Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		108.8										18.0
Intersection Capacity Utilization		76.2%										D
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: Missouri Flat Rd & Golden Center Dr

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	9	187	105	14	57	160	1020	51	96	1344	7
Future Volume (vph)	14	9	187	105	14	57	160	1020	51	96	1344	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							4.0	5.0		4.0	5.0	5.0
Lane Util. Factor							1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes							0.99	1.00		1.00	1.00	0.96
Flpb, ped/bikes							1.00	1.00		1.00	1.00	1.00
Fr _t							0.88	0.96		1.00	0.99	1.00
Flt Protected							1.00	0.97		0.95	1.00	0.95
Satd. Flow (prot)							1615	1720		1770	3510	1527
Flt Permitted							0.98	0.50		0.95	1.00	0.95
Satd. Flow (perm)							1581	893		1770	3510	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	15	10	203	109	15	59	172	1097	55	103	1445	8
RTOR Reduction (vph)	0	158	0	0	17	0	0	3	0	0	0	4
Lane Group Flow (vph)	0	70	0	0	166	0	172	1149	0	103	1445	4
Confl. Peds. (#/hr)												7
Confl. Bikes (#/hr)					1					2		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4				8		5	2		1	6
Permitted Phases	4			8								6
Actuated Green, G (s)		20.3			20.3		13.0	48.8		8.8	44.6	44.6
Effective Green, g (s)		20.3			20.3		13.0	48.8		8.8	44.6	44.6
Actuated g/C Ratio		0.22			0.22		0.14	0.54		0.10	0.49	0.49
Clearance Time (s)		4.0			4.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		353			199		253	1884		171	1736	749
v/s Ratio Prot						c0.10	0.33		0.06	c0.41		
v/s Ratio Perm		0.04			c0.19							0.00
v/c Ratio		0.20			0.83		0.68	0.61		0.60	0.83	0.01
Uniform Delay, d1		28.7			33.7		37.0	14.5		39.4	19.9	11.8
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.3			24.8		7.1	0.6		5.9	3.6	0.0
Delay (s)		29.0			58.5		44.1	15.1		45.2	23.5	11.8
Level of Service		C			E		D	B		D	C	B
Approach Delay (s)		29.0			58.5			18.8			24.9	
Approach LOS		C			E			B			C	
Intersection Summary												
HCM 2000 Control Delay		24.6			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		90.9			Sum of lost time (s)				13.0			
Intersection Capacity Utilization		83.0%			ICU Level of Service				E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
9: Missouri Flat Rd & Diamond Springs Parkway

2035 PM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑		↔	
Traffic Volume (vph)	10	770	884	48	529	10	734	10	89	10	10	10
Future Volume (vph)	10	770	884	48	529	10	734	10	89	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1612			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1612			1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	837	961	52	575	11	798	11	97	11	11	11
RTOR Reduction (vph)	0	0	336	0	0	7	0	66	0	0	10	0
Lane Group Flow (vph)	11	837	625	52	575	4	798	42	0	0	23	0
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2	28	1	6		8	8		4	4	
Permitted Phases						6						
Actuated Green, G (s)	0.6	26.1	52.2	3.0	28.5	28.5	26.1	26.1			6.7	
Effective Green, g (s)	0.6	26.1	52.2	3.0	28.5	28.5	26.1	26.1			6.7	
Actuated g/C Ratio	0.01	0.32	0.64	0.04	0.35	0.35	0.32	0.32			0.08	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	12	1127	1008	64	1231	550	1094	513			143	
v/s Ratio Prot	0.01	c0.24	0.39	c0.03	0.16		c0.23	0.03			c0.01	
v/s Ratio Perm						0.00						
v/c Ratio	0.92	0.74	0.62	0.81	0.47	0.01	0.73	0.08			0.16	
Uniform Delay, d1	40.6	24.9	8.9	39.2	20.8	17.5	24.8	19.5			35.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	212.2	2.7	1.1	52.3	0.3	0.0	2.5	0.1			0.5	
Delay (s)	252.8	27.6	10.0	91.5	21.1	17.5	27.2	19.6			35.5	
Level of Service	F	C	B	F	C	B	C	B			D	
Approach Delay (s)		19.6			26.7			26.3			35.5	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM 2000 Control Delay				22.9							C	
HCM 2000 Volume to Capacity ratio				0.68								
Actuated Cycle Length (s)				81.9							20.0	
Intersection Capacity Utilization				73.9%							D	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
10: China Garden Rd & Missouri Flat Rd

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	10	1	37	2	878	29	22	1118	1
Future Volume (Veh/h)	2	0	0	10	1	37	2	878	29	22	1118	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	11	1	40	2	954	32	23	1165	1
Pedestrians												1
Lane Width (ft)												12.0
Walking Speed (ft/s)												4.0
Percent Blockage												0
Right turn flare (veh)												
Median type							TWLTL					None
Median storage veh								2				
Upstream signal (ft)												663
pX, platoon unblocked												
vC, conflicting volume	2227	2202	1166	2185	2186	971	1166					986
vC1, stage 1 conf vol	1212	1212		974	974							
vC2, stage 2 conf vol	1016	990		1211	1212							
vCu, unblocked vol	2227	2202	1166	2185	2186	971	1166					986
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	99	100	100	94	99	87	100					97
cM capacity (veh/h)	152	189	236	171	195	306	599					693
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	2	52	988	23	1166							
Volume Left	2	11	2	23	0							
Volume Right	0	40	32	0	1							
cSH	152	260	599	693	1700							
Volume to Capacity	0.01	0.20	0.00	0.03	0.69							
Queue Length 95th (ft)	1	18	0	3	0							
Control Delay (s)	29.1	22.3	0.1	10.4	0.0							
Lane LOS	D	C	A	B								
Approach Delay (s)	29.1	22.3	0.1	0.2								
Approach LOS	D	C										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization		69.2%		ICU Level of Service					C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
11: Missouri Flat Road & Industrial Dr

2035 PM Land Use 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	114	22	817	1089	49
Future Volume (Veh/h)	160	114	22	817	1089	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	124	24	888	1184	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2146	1210	1237			
vC1, stage 1 conf vol	1210					
vC2, stage 2 conf vol	936					
vCu, unblocked vol	2146	1210	1237			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	22	44	96			
cM capacity (veh/h)	222	222	563			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	298	24	888	1237		
Volume Left	174	24	0	0		
Volume Right	124	0	0	53		
cSH	222	563	1700	1700		
Volume to Capacity	1.34	0.04	0.52	0.73		
Queue Length 95th (ft)	408	3	0	0		
Control Delay (s)	223.6	11.7	0.0	0.0		
Lane LOS	F	B				
Approach Delay (s)	223.6	0.3		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay		27.3				
Intersection Capacity Utilization		82.8%		ICU Level of Service		E
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
12: Missouri Flat Road & Enterprise Dr

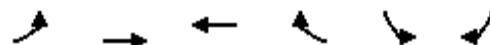
2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	1	30	1	1	1	9	668	2	4	962	106
Future Volume (Veh/h)	133	1	30	1	1	1	9	668	2	4	962	106
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	141	1	32	1	1	1	10	711	2	4	1023	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1820	1820	1080	1796	1876	712	1136				713	
vC1, stage 1 conf vol	1088	1088			732	732						
vC2, stage 2 conf vol	732	733			1064	1144						
vCu, unblocked vol	1820	1820	1080	1796	1876	712	1136				713	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	36	100	88	99	100	100	98				100	
cM capacity (veh/h)	219	242	265	197	226	432	615				882	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	174	3	10	713	4	1136						
Volume Left	141	1	10	0	4	0						
Volume Right	32	1	0	2	0	113						
cSH	226	254	615	1700	882	1700						
Volume to Capacity	0.77	0.01	0.02	0.42	0.00	0.67						
Queue Length 95th (ft)	136	1	1	0	0	0						
Control Delay (s)	59.6	19.3	11.0	0.0	9.1	0.0						
Lane LOS	F	C	B		A							
Approach Delay (s)	59.6	19.3	0.2		0.0							
Approach LOS	F	C										
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization		79.6%			ICU Level of Service				D			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
13: Pleasant Valley Rd & Missouri Flat Rd

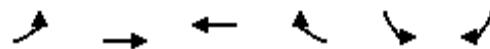
2035 PM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	319	281	308	337	642	407
Future Volume (vph)	319	281	308	337	642	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1863	1863	1583	1770	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1863	1863	1583	1770	1553
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	339	299	335	366	698	442
RTOR Reduction (vph)	0	0	0	57	0	133
Lane Group Flow (vph)	339	299	335	309	698	309
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	7	7	5
Permitted Phases				6		4
Actuated Green, G (s)	11.9	33.5	17.6	48.0	30.4	42.3
Effective Green, g (s)	11.9	33.5	17.6	48.0	30.4	42.3
Actuated g/C Ratio	0.16	0.46	0.24	0.66	0.42	0.58
Clearance Time (s)	4.0	4.1	4.1	4.6	4.6	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	562	859	451	1046	741	904
v/s Ratio Prot	c0.10	0.16	c0.18	0.12	c0.39	0.06
v/s Ratio Perm				0.07		0.14
v/c Ratio	0.60	0.35	0.74	0.30	0.94	0.34
Uniform Delay, d1	28.2	12.5	25.4	5.2	20.3	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.1	5.7	0.1	19.9	0.1
Delay (s)	29.4	12.6	31.1	5.2	40.2	8.0
Level of Service	C	B	C	A	D	A
Approach Delay (s)		21.6	17.6		27.7	
Approach LOS		C	B		C	
Intersection Summary						
HCM 2000 Control Delay		23.3		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		72.6		Sum of lost time (s)		12.7
Intersection Capacity Utilization		71.5%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
14: Pleasant Valley Rd & Commerce Way

2035 PM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	645	686	29	24	52
Future Volume (Veh/h)	16	645	686	29	24	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	701	746	32	26	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (ft)			750			
pX, platoon unblocked	0.85			0.85	0.85	
vC, conflicting volume	778			1481	746	
VC1, stage 1 conf vol				746		
VC2, stage 2 conf vol				735		
vCu, unblocked vol	648			1478	611	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)				5.4		
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			92	86	
cM capacity (veh/h)	795			338	419	
Direction, Lane #	EB 1	WB 1	WB 2	SB 1		
Volume Total	718	746	32	83		
Volume Left	17	0	0	26		
Volume Right	0	0	32	57		
cSH	795	1700	1700	390		
Volume to Capacity	0.02	0.44	0.02	0.21		
Queue Length 95th (ft)	2	0	0	20		
Control Delay (s)	0.6	0.0	0.0	16.7		
Lane LOS	A			C		
Approach Delay (s)	0.6	0.0		16.7		
Approach LOS				C		
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		58.0%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
15: Pleasant Valley Rd & Forni Rd

2035 PM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	84	530	437	38	28	157
Future Volume (Veh/h)	84	530	437	38	28	157
Sign Control	Free	Free		Stop		
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	90	570	470	41	30	169
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	511			1240	490	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	511			1240	490	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	91			83	71	
cM capacity (veh/h)	1054			177	578	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	660	511	199			
Volume Left	90	0	30			
Volume Right	0	41	169			
cSH	1054	1700	431			
Volume to Capacity	0.09	0.30	0.46			
Queue Length 95th (ft)	7	0	60			
Control Delay (s)	2.2	0.0	20.3			
Lane LOS	A		C			
Approach Delay (s)	2.2	0.0	20.3			
Approach LOS			C			
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization	79.1%		ICU Level of Service		D	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
16: SR-49 & Pleasant Valley Rd

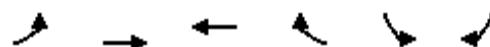
2035 PM Land Use 1



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↑	↑	↑	
Sign Control	Stop		Stop	Stop		
Traffic Volume (vph)	391	311	242	362	128	213
Future Volume (vph)	391	311	242	362	128	213
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	416	331	257	385	136	227
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total (vph)	747	257	385	363		
Volume Left (vph)	0	257	0	136		
Volume Right (vph)	331	0	0	227		
Hadj (s)	-0.23	0.53	0.03	-0.27		
Departure Headway (s)	6.0	7.2	6.7	6.5		
Degree Utilization, x	1.25	0.52	0.72	0.66		
Capacity (veh/h)	590	490	522	536		
Control Delay (s)	147.3	16.6	24.1	21.3		
Approach Delay (s)	147.3	21.1		21.3		
Approach LOS	F	C		C		
Intersection Summary						
Delay				74.9		
Level of Service				F		
Intersection Capacity Utilization			83.2%		ICU Level of Service	E
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
17: Pleasant Valley Rd & China Garden Rd

2035 PM Land Use 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	812	643	45	9	16
Future Volume (Veh/h)	9	812	643	45	9	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	883	699	49	10	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	748			1626	724	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748			1626	724	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			91	96	
cM capacity (veh/h)	861			111	426	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	893	748	27			
Volume Left	10	0	10			
Volume Right	0	49	17			
cSH	861	1700	208			
Volume to Capacity	0.01	0.44	0.13			
Queue Length 95th (ft)	1	0	11			
Control Delay (s)	0.3	0.0	24.9			
Lane LOS	A		C			
Approach Delay (s)	0.3	0.0	24.9			
Approach LOS			C			
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		59.9%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis
18: Pleasant Valley Rd & SR 49

2035 PM Land Use 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑	↑↑	↑	↑		↑↑	↑	
Traffic Volume (vph)	103	394	40	36	294	371	25	108	31	669	136	105
Future Volume (vph)	103	394	40	36	294	371	25	108	31	669	136	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.6		3.0	4.6	4.6	3.0	4.6		3.5	4.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	0.88	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Fr _t	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3490		1770	1863	2787	1770	1800		3433	1725	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3490		1770	1863	2787	1770	1800		3433	1725	
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	402	41	39	320	403	27	117	34	727	148	114
RTOR Reduction (vph)	0	8	0	0	0	0	0	13	0	0	30	0
Lane Group Flow (vph)	105	435	0	39	320	403	27	138	0	727	232	0
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.3	20.3		2.2	16.2	16.2	2.2	12.4		15.0	25.7	
Effective Green, g (s)	6.3	20.3		2.2	16.2	16.2	2.2	12.4		15.0	25.7	
Actuated g/C Ratio	0.10	0.31		0.03	0.25	0.25	0.03	0.19		0.23	0.39	
Clearance Time (s)	3.0	4.6		3.0	4.6	4.6	3.0	4.6		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	169	1079		59	460	688	59	340		784	675	
v/s Ratio Prot	c0.06	0.12		0.02	c0.17		0.02	0.08		c0.21	c0.13	
v/s Ratio Perm						0.14						
v/c Ratio	0.62	0.40		0.66	0.70	0.59	0.46	0.41		0.93	0.34	
Uniform Delay, d1	28.5	17.9		31.3	22.5	21.7	31.1	23.4		24.8	14.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	0.1		19.4	3.7	0.8	2.0	0.3		16.9	0.1	
Delay (s)	33.5	18.0		50.8	26.1	22.6	33.2	23.7		41.6	14.1	
Level of Service	C	B		D	C	C	C	C		D	B	
Approach Delay (s)		20.9			25.5			25.1			34.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		28.0			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		65.6			Sum of lost time (s)				15.7			
Intersection Capacity Utilization		62.2%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
19: Diamond Rd & Lime Kiln Rd/Black Rice Ln

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑				↑	↑↑		↑	↑↑	
Traffic Volume (veh/h)	0	0	88	0	0	164	40	456	83	200	945	32
Future Volume (Veh/h)	0	0	88	0	0	164	40	456	83	200	945	32
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	96	0	0	178	43	496	90	217	1027	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											571	
pX, platoon unblocked												
vC, conflicting volume	1990	2150	531	1670	2123	293	1062				586	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1990	2150	531	1670	2123	293	1062				586	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	81	100	100	75	93				78	
cM capacity (veh/h)	21	35	493	40	36	703	652				985	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	96	178	43	331	255	217	685	377				
Volume Left	0	0	43	0	0	217	0	0				
Volume Right	96	178	0	0	90	0	0	35				
cSH	493	703	652	1700	1700	985	1700	1700				
Volume to Capacity	0.19	0.25	0.07	0.19	0.15	0.22	0.40	0.22				
Queue Length 95th (ft)	18	25	5	0	0	21	0	0				
Control Delay (s)	14.1	11.8	10.9	0.0	0.0	9.7	0.0	0.0				
Lane LOS	B	B	B			A						
Approach Delay (s)	14.1	11.8	0.7			1.6						
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization		39.3%		ICU Level of Service					A			
Analysis Period (min)		15										

HCM Signalized Intersection Capacity Analysis
20: Diamond Rd & Diamond Springs Parkway

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑		↑	↑	↑	↑		↑	↑	↑
Traffic Volume (vph)	165	43	800	37	53	31	493	259	22	18	339	75
Future Volume (vph)	165	43	800	37	53	31	493	259	22	18	339	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583		1825	1583	3433	1841		1770	1863	1583
Flt Permitted	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583		1825	1583	3433	1841		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	47	870	40	58	34	536	282	24	20	368	82
RTOR Reduction (vph)	0	0	142	0	0	31	0	2	0	0	0	61
Lane Group Flow (vph)	179	47	728	0	98	3	536	304	0	20	368	21
Turn Type	Split	NA	pt+ov	Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	4	4	4 5	8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	37.0	37.0	56.1		8.7	8.7	19.1	46.8		1.9	29.6	29.6
Effective Green, g (s)	37.0	37.0	56.1		8.7	8.7	19.1	46.8		1.9	29.6	29.6
Actuated g/C Ratio	0.32	0.32	0.49		0.08	0.08	0.17	0.41		0.02	0.26	0.26
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	572	602	776		138	120	573	753		29	482	409
v/s Ratio Prot	0.10	0.03	c0.46		c0.05		0.16	0.16		0.01	c0.20	
v/s Ratio Perm						0.00						0.01
v/c Ratio	0.31	0.08	0.94		0.71	0.02	0.94	0.40		0.69	0.76	0.05
Uniform Delay, d1	29.1	26.9	27.5		51.6	48.9	47.0	23.9		56.0	39.2	31.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	18.8		15.8	0.1	22.7	0.4		51.3	7.1	0.1
Delay (s)	29.4	26.9	46.3		67.4	49.0	69.7	24.3		107.2	46.2	31.9
Level of Service	C	C	D		E	D	E	C		F	D	C
Approach Delay (s)		42.7			62.7			53.2			46.3	
Approach LOS		D			E			D			D	

Intersection Summary

HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	114.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
21: Diamond Rd & Bradley Dr

2035 PM Land Use 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (veh/h)	119	0	7	447	435	80
Future Volume (Veh/h)	119	0	7	447	435	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Hourly flow rate (vph)	129	0	8	486	453	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh						
Upstream signal (ft)			389			
pX, platoon unblocked	0.89					
vC, conflicting volume	996	494	536			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	934	494	536			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	50	100	99			
cM capacity (veh/h)	260	575	1032			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	129	8	486	536		
Volume Left	129	8	0	0		
Volume Right	0	0	0	83		
cSH	259	1032	1700	1700		
Volume to Capacity	0.50	0.01	0.29	0.32		
Queue Length 95th (ft)	64	1	0	0		
Control Delay (s)	31.9	8.5	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	31.9	0.1		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		41.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
22: US-50 WB On-ramp/US-50 WB Off-ramp & El Dorado Rd

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	174	0	47	122	347	0	0	171	196
Future Volume (Veh/h)	0	0	0	174	0	47	122	347	0	0	171	196
Sign Control	Stop				Stop			Free			Free	
Grade		0%				0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	189	0	51	133	377	0	0	186	213
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	986	936	292	936	1042	377	399			377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986	936	292	936	1042	377	399			377		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	16	100	92	89			100		
cM capacity (veh/h)	191	235	747	224	203	670	1160			1181		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	240	510	399									
Volume Left	189	133	0									
Volume Right	51	0	213									
cSH	261	1160	1700									
Volume to Capacity	0.92	0.11	0.23									
Queue Length 95th (ft)	207	10	0									
Control Delay (s)	78.6	3.1	0.0									
Lane LOS	F	A										
Approach Delay (s)	78.6	3.1	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay		17.8										
Intersection Capacity Utilization	68.5%			ICU Level of Service				C				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis
23: El Dorado Rd & US-50 EB Off-ramp/US-50 EB On-ramp

2035 PM Land Use 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑			↑	
Traffic Volume (veh/h)	242	0	137	0	0	0	0	227	128	51	293	0
Future Volume (Veh/h)	242	0	137	0	0	0	0	227	128	51	293	0
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	263	0	149	0	0	0	0	247	139	55	318	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	744	814	318	894	744	316	318				386	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	744	814	318	894	744	316	318				386	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	17	100	79	100	100	100	100				95	
cM capacity (veh/h)	319	298	723	201	326	724	1242				1172	
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	412	386	373									
Volume Left	263	0	55									
Volume Right	149	139	0									
cSH	399	1700	1172									
Volume to Capacity	1.03	0.23	0.05									
Queue Length 95th (ft)	331	0	4									
Control Delay (s)	86.3	0.0	1.6									
Lane LOS	F		A									
Approach Delay (s)	86.3	0.0	1.6									
Approach LOS	F											
Intersection Summary												
Average Delay			30.9									
Intersection Capacity Utilization		69.8%			ICU Level of Service				C			
Analysis Period (min)			15									

APPENDIX B: 2035 AND 2040 TRAFFIC FORECAST SIMULATION FINDINGS

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.4	0.2	0.3	0.2	0.3	0.0	0.0	0.0	3.2	1.7	3.2
Total Del/Veh (s)	104.1	104.8	51.7	32.0	32.0	20.8	42.7	14.7	5.0	62.8	39.1	23.2

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	33.2

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	50.1	17.6	25.3	6.1	23.7	4.1	22.5

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	783.2	644.0	769.4	0.0	0.0	0.0	0.0	176.8
Total Del/Veh (s)	149.3	371.8	331.0	21.3	7.0	23.5	10.6	59.5

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	14.0	9.2	0.0	0.0	0.0	0.0	1.0
Total Del/Veh (s)	109.5	20.9	57.8	18.3	14.7	1.8	21.7

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	3.6	3.6	0.0	1.8
Total Del/Veh (s)	98.9	15.0	3.2	40.6

Total Zone Performance

Denied Del/Veh (s)	126.2
Total Del/Veh (s)	326.3

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.8	1.6	1.6	0.3	0.2	0.2	0.0	0.0	0.0	3.5	2.1	3.5
Total Del/Veh (s)	130.8	135.4	61.4	30.9	32.3	20.1	42.5	15.8	4.8	78.0	54.7	37.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	40.4

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	50.9	20.4	26.2	6.4	30.4	4.8	25.4

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	793.1	869.7	791.3	0.0	0.0	0.0	0.0	191.3
Total Del/Veh (s)	127.1	275.9	275.7	23.5	8.1	28.3	10.5	57.5

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.8	0.6	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	30.0	20.5	80.2	34.5	11.8	1.7	21.6

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	98.0	97.6	0.0	50.2
Total Del/Veh (s)	170.8	45.6	2.8	70.9

Total Zone Performance

Denied Del/Veh (s)	162.4
Total Del/Veh (s)	377.3

1: Performance by movement

Movement	NBT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	5.4	2.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.4	0.2	0.3	0.3	0.3	0.0	0.0	0.0	3.2	1.7	3.1
Total Del/Veh (s)	80.1	86.9	42.3	32.0	29.9	18.5	44.9	22.2	8.3	68.2	52.7	32.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	36.4

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	50.6	13.4	26.4	15.0	36.2	4.8	27.9

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	2.3	2.0	3.5	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	35.7	38.1	45.7	16.3	4.2	56.5	15.1	26.6

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.6	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	65.4	21.8	55.3	9.4	6.8	1.6	11.6

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.6	0.7	0.0	0.3
Total Del/Veh (s)	7.7	4.0	2.2	4.3

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	68.7

1: Performance by movement

Movement	NBT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	6.3	3.2

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.7	0.8	0.5	0.3	0.3	0.3	0.0	0.0	0.0	86.9	78.2	79.3
Total Del/Veh (s)	127.3	131.1	60.5	33.3	32.7	22.2	49.9	15.7	5.7	154.0	139.4	119.9

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	21.7
Total Del/Veh (s)	62.3

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	57.4	18.1	28.2	15.9	54.5	6.5	35.4

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	44.8	35.1	45.0	0.0	0.0	0.0	0.0	10.3
Total Del/Veh (s)	48.6	45.2	136.8	20.2	11.7	56.0	22.4	47.1

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.7	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	33.5	23.6	74.0	25.5	10.0	1.8	17.5

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	1.1	1.2	0.0	0.5
Total Del/Veh (s)	43.8	7.6	2.9	18.4

Total Network Performance

Denied Del/Veh (s)	19.9
Total Del/Veh (s)	113.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.4	0.2	0.3	0.3	0.2	0.0	0.0	0.0	3.0	1.7	3.1
Total Del/Veh (s)	102.6	95.7	50.1	31.5	30.1	20.5	40.0	13.7	4.9	57.0	37.1	18.7

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	31.4

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	52.3	16.6	30.1	9.6	21.5	4.0	23.0

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBC	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	1.8	1.5	1.6	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	46.4	60.4	50.3	66.6	11.5	28.3	6.6	34.2

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBC	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.8	0.5	2.6	2.0	0.0	0.0	1.1
Total Del/Veh (s)	37.0	19.0	149.0	66.0	11.2	7.7	37.3

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	87.1

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.9	1.4	0.9	0.2	0.3	0.3	0.0	0.0	0.0	13.9	11.6	11.1
Total Del/Veh (s)	116.3	119.2	57.9	35.8	33.9	22.3	58.3	26.0	8.0	100.8	90.9	69.1

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	3.4
Total Del/Veh (s)	52.9

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	49.3	17.4	40.5	16.4	43.1	5.5	32.5

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	2.0	2.1	1.8	0.0	0.0	0.0	0.0	0.4
Total Del/Veh (s)	65.9	111.8	52.6	46.7	12.0	60.3	15.8	36.7

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.6	4.2	4.0	0.0	0.0	1.9
Total Del/Veh (s)	63.2	31.7	223.8	37.9	17.8	13.0	31.9

Total Network Performance

Denied Del/Veh (s)	3.6
Total Del/Veh (s)	103.1

APPENDIX C: 2040 INTERCHANGE ALTERNATIVES SIMULATION FINDINGS

2040 Original Signal Timing

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.8	1.6	1.6	0.3	0.2	0.2	0.0	0.0	0.0	3.5	2.1	3.5
Total Del/Veh (s)	130.8	135.4	61.4	30.9	32.3	20.1	42.5	15.8	4.8	78.0	54.7	37.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	40.4

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	50.9	20.4	26.2	6.4	30.4	4.8	25.4

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	793.1	869.7	791.3	0.0	0.0	0.0	0.0	191.3
Total Del/Veh (s)	127.1	275.9	275.7	23.5	8.1	28.3	10.5	57.5

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.8	0.6	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	30.0	20.5	80.2	34.5	11.8	1.7	21.6

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	98.0	97.6	0.0	50.2
Total Del/Veh (s)	170.8	45.6	2.8	70.9

Total Zone Performance

Denied Del/Veh (s)	162.4
Total Del/Veh (s)	377.3

Intersection: 3: Missouri Flat Rd & Plaza Dr

Phase	1	2	5	6	7	8
Movement(s) Served	NBL	SBT	SBL	NBT	EBTL	WBTL
Maximum Green (s)	10.7	23.3	6.5	27.5	13.1	28.0
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	10.7	28.6	7.1	33.7	13.1	23.3
g/C Ratio	NA	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	0	0	24	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	22	100	98	33
Cycles with Peds (%)	0	8	0	3	0	10

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 4: Missouri Flat Rd & US 50 WB Ramps

Phase	1	2	4	6
Movement(s) Served	NBL	SBT	WBTL	NBT
Maximum Green (s)	17.0	39.0	19.9	60.0
Minimum Green (s)	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max
Avg. Green (s)	17.0	39.6	19.3	60.6
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	100	100	83	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Missouri Flat Rd & US 50 EB Ramps

Phase	2	5	6	8
Movement(s) Served	SBT	SBL	NBT	EBTL
Maximum Green (s)	56.1	15.5	37.1	24.9
Minimum Green (s)	8.0	4.0	8.0	4.0
Recall	C-Max	None	C-Max	None
Avg. Green (s)	56.1	15.5	37.1	24.9
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100
Cycles with Peds (%)	3	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Missouri Flat Rd & Mother Lode Dr

Phase	1	2	6	8
Movement(s) Served	NBL	SBT	NBT	EBL
Maximum Green (s)	4.0	43.1	51.1	30.0
Minimum Green (s)	4.0	8.0	8.0	4.0
Recall	None	C-Max	C-Max	None
Avg. Green (s)	4.1	54.7	61.1	22.4
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	23	0	0	0
Cycles @ Minimum (%)	77	0	0	0
Cycles Maxed Out (%)	77	100	100	56
Cycles with Peds (%)	0	0	0	54

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 Modified Signal Timing

Average of Ten 1-Hour Simulations for the PM Peak Hour

1: Performance by movement

Movement	NBT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	6.3	3.2

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.7	0.8	0.5	0.3	0.3	0.3	0.0	0.0	0.0	86.9	78.2	79.3
Total Del/Veh (s)	127.3	131.1	60.5	33.3	32.7	22.2	49.9	15.7	5.7	154.0	139.4	119.9

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	21.7
Total Del/Veh (s)	62.3

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	57.4	18.1	28.2	15.9	54.5	6.5	35.4

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	44.8	35.1	45.0	0.0	0.0	0.0	0.0	10.3
Total Del/Veh (s)	48.6	45.2	136.8	20.2	11.7	56.0	22.4	47.1

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.7	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	33.5	23.6	74.0	25.5	10.0	1.8	17.5

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	1.1	1.2	0.0	0.5
Total Del/Veh (s)	43.8	7.6	2.9	18.4

Total Network Performance

Denied Del/Veh (s)	19.9
Total Del/Veh (s)	113.8

Intersection: 3: Missouri Flat Rd & Plaza Dr

Phase	1	2	5	6	7	8
Movement(s) Served	NBL	SBT	SBL	NBT	EBTL	WBTL
Maximum Green (s)	10.3	23.8	6.6	27.5	13.0	28.0
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	12.0	26.7	6.6	35.5	13.0	23.4
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	9	0	33	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	52	100	67	100	98	38
Cycles with Peds (%)	0	35	0	5	0	10

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 4: Missouri Flat Rd & US 50 WB Ramps

Phase	1	2	4	6
Movement(s) Served	NBL	SBT	WBTL	NBT
Maximum Green (s)	18.0	39.0	18.9	61.0
Minimum Green (s)	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max
Avg. Green (s)	17.8	39.4	18.7	61.2
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	85	100	93	100
Cycles with Peds (%)	0	0	0	3

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Missouri Flat Rd & US 50 EB Ramps

Phase	5	6	8
Movement(s) Served	SBL	NBSB	EBTL
Maximum Green (s)	18.5	44.1	14.9
Minimum Green (s)	4.0	8.0	4.0
Recall	None	C-Max	None
Avg. Green (s)	18.5	44.1	14.9
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	100	100
Cycles with Peds (%)	0	3	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Missouri Flat Rd & Mother Lode Dr

Phase	1	2	6	8
Movement(s) Served	NBL	SBT	NBT	EBL
Maximum Green (s)	4.0	43.1	51.1	30.0
Minimum Green (s)	4.0	8.0	8.0	4.0
Recall	None	C-Max	C-Max	None
Avg. Green (s)	4.0	59.3	66.0	17.2
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	15	0	0	0
Cycles @ Minimum (%)	85	0	0	0
Cycles Maxed Out (%)	85	100	100	26
Cycles with Peds (%)	0	0	0	21

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 Lane Reconfiguration 1

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.6	1.7	1.6	0.3	0.3	0.2	0.0	0.0	0.0	4.2	2.9	4.4
Total Del/Veh (s)	164.0	164.2	75.3	31.9	32.0	20.8	41.9	14.2	5.5	79.3	54.4	33.3

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	42.7

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	54.9	15.1	25.8	5.6	32.3	5.0	25.6

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	751.9	713.3	745.7	0.0	0.0	0.0	0.0	175.4
Total Del/Veh (s)	181.3	310.5	274.9	23.8	7.3	29.9	10.9	57.8

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.7	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	29.7	20.7	82.4	34.9	11.7	1.7	21.9

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	31.7	31.4	0.0	16.2
Total Del/Veh (s)	143.4	66.0	2.3	64.2

Total Zone Performance

Denied Del/Veh (s)	132.9
Total Del/Veh (s)	375.9

2040 Lane Reconfiguration 2

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.0	0.8	0.8	0.2	0.3	0.3	0.0	0.0	0.0	3.6	2.5	3.7
Total Del/Veh (s)	119.9	121.3	59.6	31.5	32.6	21.5	41.8	15.1	4.9	76.9	52.9	34.7

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	38.3

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	55.5	17.9	37.7	4.8	24.7	4.3	25.0

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	749.5	842.2	757.1	0.0	0.0	0.0	0.0	173.9
Total Del/Veh (s)	193.1	248.5	271.9	20.5	7.6	26.1	8.9	55.2

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.6	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	29.3	19.7	57.6	13.7	11.7	1.7	13.9

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.5	0.6	0.0	0.3
Total Del/Veh (s)	5.1	5.0	2.3	3.7

Total Zone Performance

Denied Del/Veh (s)	125.9
Total Del/Veh (s)	265.2

2040 Lane Reconfiguration 3

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	5.5	6.0	6.0	0.3	0.3	0.3	0.0	0.0	0.0	3.6	2.1	3.4
Total Del/Veh (s)	158.3	160.4	68.9	32.0	30.0	21.7	42.3	14.9	4.5	69.9	46.1	30.1

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	1.6
Total Del/Veh (s)	39.9

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.7	1.1	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	49.8	16.3	22.4	6.9	16.1	3.4	19.3

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBT	EBC	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	35.4	42.8	37.2	0.0	0.0	0.0	0.0	8.8
Total Del/Veh (s)	28.9	27.2	112.8	20.5	10.3	26.6	9.7	35.4

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBC	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.6	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	28.2	7.6	93.8	39.5	10.4	10.5	21.3

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	255.2	254.1	0.0	121.7
Total Del/Veh (s)	228.8	45.1	1.8	81.1

Total Zone Performance

Denied Del/Veh (s)	82.6	
Total Del/Veh (s)	314.1	

2040 Single Point Diamond Interchange

Average of Ten 1-Hour Simulations for the PM Peak Hour

2: Missouri Flat Rd & SR 50 EB On-Ramp/SR 50 WB On-Ramp & SR 50 EB Off-Ramp/SR 50 WB Off-Ramp

Movement	EBL	EBR2	WBL	WBR2	NBL	NBT	SBL	SBT	All
Denied Del/Veh (s)	5.5	4.8	0.4	0.2	0.0	0.0	0.0	0.0	1.1
Total Del/Veh (s)	53.0	59.0	65.5	5.1	73.1	28.8	48.6	24.9	43.8

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.5	0.3	0.2	0.3	0.3	0.0	0.0	0.0	3.1	1.9	3.1
Total Del/Veh (s)	78.0	79.3	44.1	44.3	47.2	33.6	53.4	18.5	5.5	87.1	42.8	28.3

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	36.6

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.8	0.7	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	43.0	29.0	103.0	12.9	12.9	2.4	15.6

9: SR 50 WB On-Ramp Performance by movement

Movement	WBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.6	0.6	1.3

11: SR 50 WB On-Ramp & Missouri Flat Rd Performance by movement

Movement	SET	SER	NWT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.3	3.1	9.0	6.9

12: SR 50 EB On-Ramp Performance by movement

Movement	WBR	NBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.1	1.5	1.8

13: Missouri Flat Rd & SR 50 EB On-Ramp Performance by movement

Movement	SET	NWT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	14.7	13.5	2.6	12.5

Total Network Performance

Denied Del/Veh (s)	3.5
Total Del/Veh (s)	82.2

Intersection: 2: Missouri Flat Rd & SR 50 EB On-Ramp/SR 50 WB On-Ramp & SR 50 EB Off-Ramp/SR 50 WB Off-Ramp

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBT	WBL	EBR	NBL	SBT	EBL	WBR
Maximum Green (s)	23.0	34.5	22.6	14.0	23.0	34.5	23.6	13.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall	None	C-Max	None	None	None	C-Max	None	None
Avg. Green (s)	23.0	34.5	22.6	14.0	23.0	34.5	19.2	19.5
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	-0.01
Cycles Skipped (%)	0	0	0	0	0	0	0	3
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	97	100	100	100	27	97
Cycles with Peds (%)	0	13	0	0	0	13	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: Missouri Flat Rd & Plaza Dr

Phase	1	2	5	6	7	8
Movement(s) Served	NBL	SBT	SBL	NBT	EBTL	WBTL
Maximum Green (s)	14.1	35.6	10.6	39.1	22.1	28.3
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	14.5	39.5	8.5	46.6	21.2	25.3
g/C Ratio	NA	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	0	0	21	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	12	100	84	45
Cycles with Peds (%)	0	10	0	6	0	6

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Missouri Flat Rd & Mother Lode Dr

Phase	1	2	6	8
Movement(s) Served	NBL	SBT	NBT	EBL
Maximum Green (s)	6.0	66.1	76.1	30.0
Minimum Green (s)	4.0	8.0	8.0	4.0
Recall	None	C-Max	C-Max	None
Avg. Green (s)	6.1	76.5	88.7	21.0
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	6	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	94	100	100	33
Cycles with Peds (%)	0	0	0	30

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 Partial Cloverleaf

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	0.2	0.3	0.5	0.5	0.0	0.0	0.0	3.4	2.6	3.4
Total Del/Veh (s)	58.4	61.4	31.8	44.5	49.6	42.1	56.7	19.8	5.0	70.6	43.0	40.1

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	35.3

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.8	1.1	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	62.9	26.9	34.3	8.2	20.7	4.6	25.6

5: Missouri Flat Rd & US 50 EB Ramps Performance by movement

Movement	EBL	EBC	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	24.6	65.9	14.2	11.0	6.5	22.0

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBC	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	3.7	0.6	2.1	0.8	0.0	0.0	0.5
Total Del/Veh (s)	38.5	26.9	98.3	16.7	22.2	14.9	21.7

7: US 50 EB Ramps Performance by movement

Movement	EBT	WBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	21.3	4.4	15.4

11: Missouri Flat Rd Performance by movement

Movement	SET	NWT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.6	4.8	3.0	5.5

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	76.4

Intersection: 3: Missouri Flat Rd & Plaza Dr

Phase	1	2	5	6	7	8
Movement(s) Served	NBL	SBT	SBL	NBT	EBTL	WBTL
Maximum Green (s)	14.5	33.8	10.3	38.0	18.5	28.3
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	14.5	37.5	8.1	45.7	18.2	25.4
g/C Ratio	NA	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	0	0	22	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	11	100	81	53
Cycles with Peds (%)	0	9	0	6	0	6

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 4: Missouri Flat Rd & US 50 WB Ramps

Phase	1	2	4	6
Movement(s) Served	NBL	SBT	WBTL	NBT
Maximum Green (s)	22.0	50.0	23.9	76.0
Minimum Green (s)	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max
Avg. Green (s)	22.0	50.4	23.4	76.5
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	100	100	88	100
Cycles with Peds (%)	0	3	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Missouri Flat Rd & US 50 EB Ramps

Phase	2	6	8
Movement(s) Served	SBT	NBT	EBL
Maximum Green (s)	58.1	58.1	42.9
Minimum Green (s)	8.0	8.0	4.0
Recall	C-Max	C-Max	None
Avg. Green (s)	60.3	60.3	40.6
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	100	75
Cycles with Peds (%)	3	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Missouri Flat Rd & Mother Lode Dr

Phase	1	2	6	8
Movement(s) Served	NBL	SBT	NBT	EBL
Maximum Green (s)	5.0	62.1	71.1	30.0
Minimum Green (s)	4.0	8.0	8.0	4.0
Recall	None	C-Max	C-Max	None
Avg. Green (s)	5.1	69.3	80.1	23.6
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	6	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	94	100	100	56
Cycles with Peds (%)	0	3	0	56

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 Hook Ramps

Average of Ten 1-Hour Simulations for the PM Peak Hour

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	0.2	0.3	0.4	0.4	0.0	0.0	0.0	3.9	3.3	4.1
Total Del/Veh (s)	83.3	84.9	35.8	31.0	37.9	29.7	92.3	18.2	5.5	58.7	54.9	57.2

3: Missouri Flat Rd & Plaza Dr Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	40.8

4: Missouri Flat Rd & US 50 WB Ramps Performance by movement

Movement	WBL	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.9	1.2	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	63.9	21.5	44.9	12.4	27.7	4.6	30.0

5: Mother Lode Dr & I-580 EB Off-Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	All
Denied Del/Veh (s)	1.0	1.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	27.2	28.0	15.3	5.2	10.8	12.3

6: Missouri Flat Rd & Mother Lode Dr Performance by movement

Movement	EBL	EBT	EBC	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.3	2.4	18.7	39.5	18.9	24.7	6.1	18.5

33: Missouri Flat Rd Performance by movement

Movement	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.7	0.7	0.0	0.3
Total Del/Veh (s)	10.3	4.3	2.7	5.6

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	64.8

Intersection: 3: Missouri Flat Rd & Plaza Dr

Phase	1	2	5	6	7	8
Movement(s) Served	NBL	SBT	SBL	NBT	EBTL	WBTL
Maximum Green (s)	7.5	27.6	7.6	27.5	12.0	28.0
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	10.2	28.8	7.8	35.3	12.0	24.2
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	5	0	29	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	76	100	71	100	98	50
Cycles with Peds (%)	0	49	0	3	0	13

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 4: Missouri Flat Rd & US 50 WB Ramps

Phase	1	2	4	6
Movement(s) Served	NBL	SBT	WBTL	NBT
Maximum Green (s)	18.0	39.0	18.9	61.0
Minimum Green (s)	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max
Avg. Green (s)	17.2	39.9	18.8	61.1
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	78	100	95	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Mother Lode Dr & I-580 EB Off-Ramp

Phase	4	6	8
Movement(s) Served	EBTL	SBL	WBT
Maximum Green (s)	17.9	18.9	17.9
Minimum Green (s)	4.0	4.0	4.0
Recall	None	C-Max	None
Avg. Green (s)	16.3	21.5	16.3
g/C Ratio	-0.01	-0.01	-0.01
Cycles Skipped (%)	1	1	1
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	67	99	67
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Missouri Flat Rd & Mother Lode Dr

Phase	1	2	6	8
Movement(s) Served	NBL	SBT	NBT	EBL
Maximum Green (s)	9.0	36.1	49.1	31.9
Minimum Green (s)	4.0	8.0	8.0	4.0
Recall	None	None	None	C-Max
Avg. Green (s)	9.7	35.6	49.1	31.9
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	100	93	100	100
Cycles with Peds (%)	0	3	0	53

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 Diverging Diamond Interchange

Average of Ten 1-Hour Simulations for the PM Peak Hour

1: Missouri Flat Road Performance by movement

Movement	WBT	NET	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.4	19.3	14.1

2: Missouri Flat Road & US 50 WB Off-Ramp to SB Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.9	47.6	15.6

3: Missouri Flat Road Performance by movement

Movement	NBL	NBT	NBR2	SBL	SBT	SBR	NEL	NER	NER2	SWL	SWT	SWR
Denied Del/Veh (s)	0.4	0.3	0.6	0.2	0.3	0.3	2.7	0.3	0.4	0.0	0.0	0.0
Total Del/Veh (s)	37.0	36.9	20.9	30.4	32.1	20.9	50.7	36.6	32.6	52.0	13.3	5.4

3: Missouri Flat Road Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	27.0

4: Missouri Flat Road Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	4.0	7.5	6.1

5: Missouri Flat Road Performance by movement

Movement	EBT	EBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.7	1.3	2.5

6: Motherlode Drive & Missouri Flat Road Performance by movement

Movement	EBR	EBR2	NBL	NBR	NWT	All
Denied Del/Veh (s)	0.0	0.0	3.7	0.7	0.0	0.2
Total Del/Veh (s)	3.0	2.4	35.1	10.6	3.6	5.0

7: Missouri Flat Road & US 50 WB Off-Ramp to NB Performance by movement

Movement	WBT	SWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.5	6.9	3.5

8: US 50 WB Off-Ramp to NB & US 50 WB Off-Ramp to SB Performance by movement

Movement	SBT	SBR	All
Denied Del/Veh (s)	0.6	2.9	1.7
Total Del/Veh (s)	12.1	0.9	6.6

10: Performance by movement

Movement	SBT	SER	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.3

12: Missouri Flat Road & US 50 EB On-Ramp to NB Performance by movement

Movement	WBT	WBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.8	1.4	3.6

13: Missouri Flat Road Performance by movement

Movement	EBT	SWT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	8.9	14.5	11.6

14: US 50 EB Off-Ramp to SB & Missouri Flat Road Performance by movement

Movement	EBT	NER	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.7	17.5	7.5

15: US 50 EB On-Ramp to NB Performance by movement

Movement	NBT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.7	0.4

16: Missouri Flat Road Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	9.6	14.6	13.3

17: US 50 EB Off-Ramp to NB & Missouri Flat Road Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.2	11.3	3.3

18: US 50 EB Off-Ramp to NB & US 50 EB Off-Ramp to SB Performance by movement

Movement	NBT	NBR	All
Denied Del/Veh (s)	2.2	3.5	3.2
Total Del/Veh (s)	1.2	4.6	4.0

26: Performance by movement

Movement	WBR	NBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.1	0.6	2.9

27: Missouri Flat Road Performance by movement

Movement	EBT	WBT	WBR	All
Denied Del/Veh (s)	0.0	1.1	2.3	0.7
Total Del/Veh (s)	1.2	3.6	5.1	2.5

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	48.2

Intersection: 1: Missouri Flat Road

Phase	2	4
Movement(s) Served	NET	WBT
Maximum Green (s)	46.0	34.0
Minimum Green (s)	4.0	4.0
Recall	Max	C-Max
Avg. Green (s)	46.0	34.0
g/C Ratio	NA	NA
Cycles Skipped (%)	0	0
Cycles @ Minimum (%)	0	0
Cycles Maxed Out (%)	100	100
Cycles with Peds (%)	8	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: Missouri Flat Road

Phase	1	2	5	6	7	8
Movement(s) Served	SWL	NER	NEL	SWT	NBTL	SBTL
Maximum Green (s)	10.3	26.5	8.9	27.9	10.3	28.0
Minimum Green (s)	4.0	8.0	4.0	8.0	4.0	8.0
Recall	None	C-Max	None	C-Max	None	None
Avg. Green (s)	11.7	29.3	9.1	35.3	13.4	21.5
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	9	0	28	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	60	100	72	100	54	23
Cycles with Peds (%)	0	21	0	3	0	8

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 6: Motherlode Drive & Missouri Flat Road

Phase	2	6	8
Movement(s) Served	EBR	NWT	NBL
Maximum Green (s)	51.1	51.1	30.0
Minimum Green (s)	8.0	8.0	4.0
Recall	C-Max	Max	None
Avg. Green (s)	69.3	69.3	11.8
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	100	3
Cycles with Peds (%)	0	0	3

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Missouri Flat Road

Phase	2	4
Movement(s) Served	SWT	EBT
Maximum Green (s)	43.0	38.0
Minimum Green (s)	4.0	4.0
Recall	Max	C-Max
Avg. Green (s)	43.0	38.0
g/C Ratio	NA	NA
Cycles Skipped (%)	0	0
Cycles @ Minimum (%)	0	0
Cycles Maxed Out (%)	100	100
Cycles with Peds (%)	20	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

2040 DDI With Relocation of Motherlode
Average of Ten 1-Hour Simulations for the PM Peak Hour

1: Missouri Flat Road Performance by movement

Movement	WBT	NET	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	11.2	31.6	23.4

2: Missouri Flat Road & US 50 WB Off-Ramp to SB Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.3	65.1	20.8

3: Missouri Flat Road Performance by movement

Movement	NBL	NBT	NBR2	SBL	SBT	SBR	NEL	NER	NER2	SWL	SWT	SWR
Denied Del/Veh (s)	0.3	0.3	0.2	3.5	2.4	4.0	3.6	1.1	1.2	0.0	0.0	0.0
Total Del/Veh (s)	51.8	52.4	29.8	43.0	40.1	31.9	58.5	41.6	36.9	60.5	15.1	6.4

3: Missouri Flat Road Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	33.2

4: Missouri Flat Road Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	4.5	4.7	4.6

5: Missouri Flat Road Performance by movement

Movement	EBT	EBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.0	2.3	6.4

6: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.8	1.4	0.3	0.1	0.7
Total Del/Veh (s)	16.8	3.4	64.3	28.4	27.2	19.5	22.3

7: Missouri Flat Road & US 50 WB Off-Ramp to NB Performance by movement

Movement	WBT	SWR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.4	11.0	5.6

8: US 50 WB Off-Ramp to NB & US 50 WB Off-Ramp to SB Performance by movement

Movement	SBT	SBR	All
Denied Del/Veh (s)	13.2	13.4	13.3
Total Del/Veh (s)	43.5	3.2	23.9

10: Performance by movement

Movement	SBT	SER	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.6	0.3	0.5

12: Missouri Flat Road & US 50 EB On-Ramp to NB Performance by movement

Movement	WBT	WBR	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	4.2	2.0	3.5

13: Missouri Flat Road Performance by movement

Movement	EBT	SWT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	16.7	15.6	16.1

14: US 50 EB Off-Ramp to SB & Missouri Flat Road Performance by movement

Movement	EBT	NER	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.7	21.9	9.8

15: US 50 EB On-Ramp to NB Performance by movement

Movement	NBT	NWT	NWR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	1.8	0.5	0.6	1.1

16: Missouri Flat Road Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.5	16.0	13.6

17: US 50 EB Off-Ramp to NB & Missouri Flat Road Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.2	12.2	3.5

18: US 50 EB Off-Ramp to NB & US 50 EB Off-Ramp to SB Performance by movement

Movement	NBT	NBR	All
Denied Del/Veh (s)	3.3	4.6	4.4
Total Del/Veh (s)	1.4	7.8	6.5

20: Missouri Flat Road Performance by movement

Movement	EBR	NWT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.5	1.3	3.5

Total Network Performance

Denied Del/Veh (s)	4.1
Total Del/Veh (s)	84.5