
Cobey Creek
Traffic Impact Study
Lee's Summit, Missouri

March 22nd, 2024



Prepared by:



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INTRODUCTION

The purpose of this traffic impact study is to assess the potential impact on traffic with the Cobey Creek mixed use development on the northwest corner of the intersection of Doc Henry Road and Highway 150 in Lee's Summit, Missouri. The location of the development in relation to the street network is shown in Figure 1. The site plan for the development is shown in Figure 2.

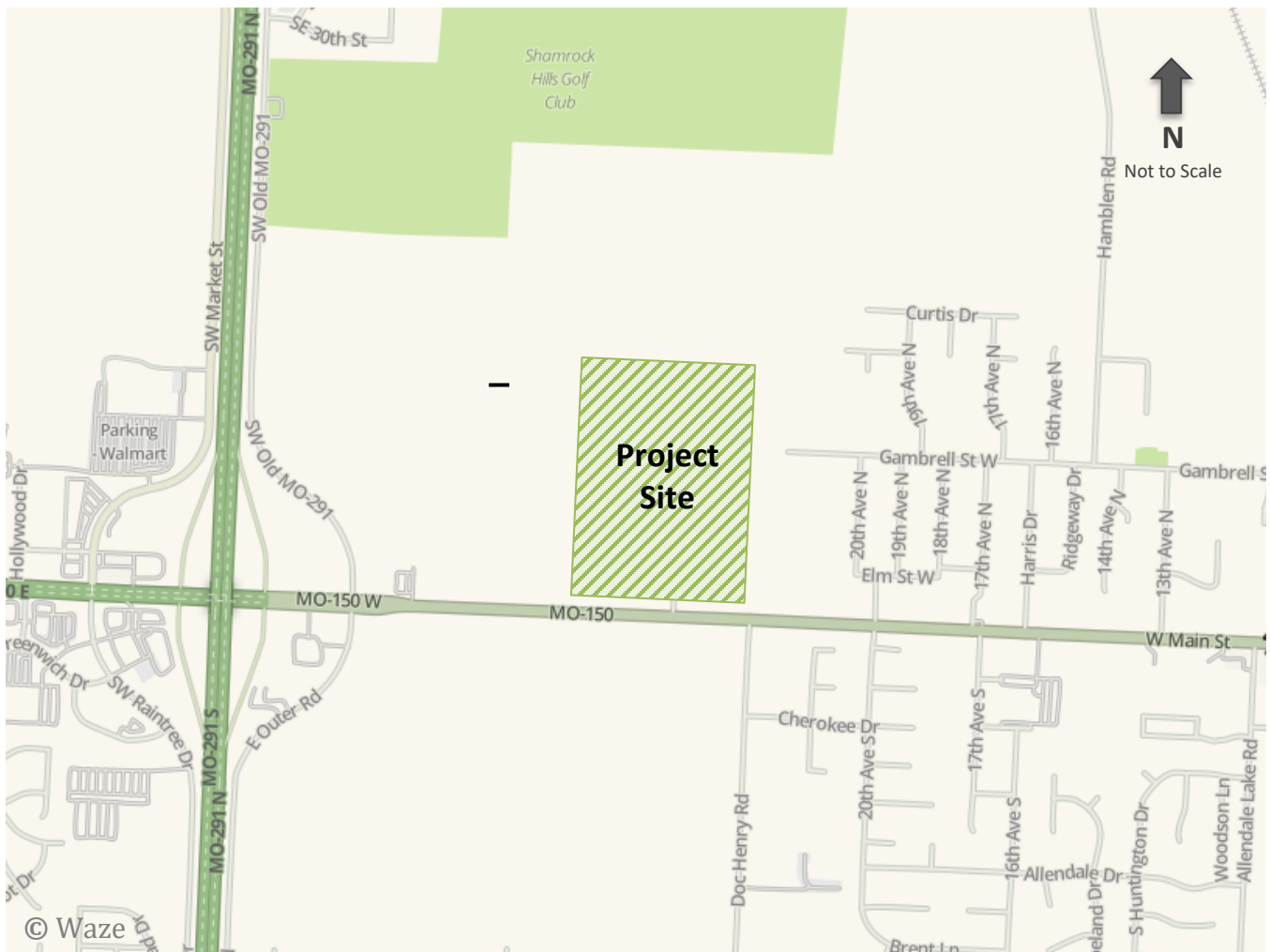


Figure 1 – Development Location

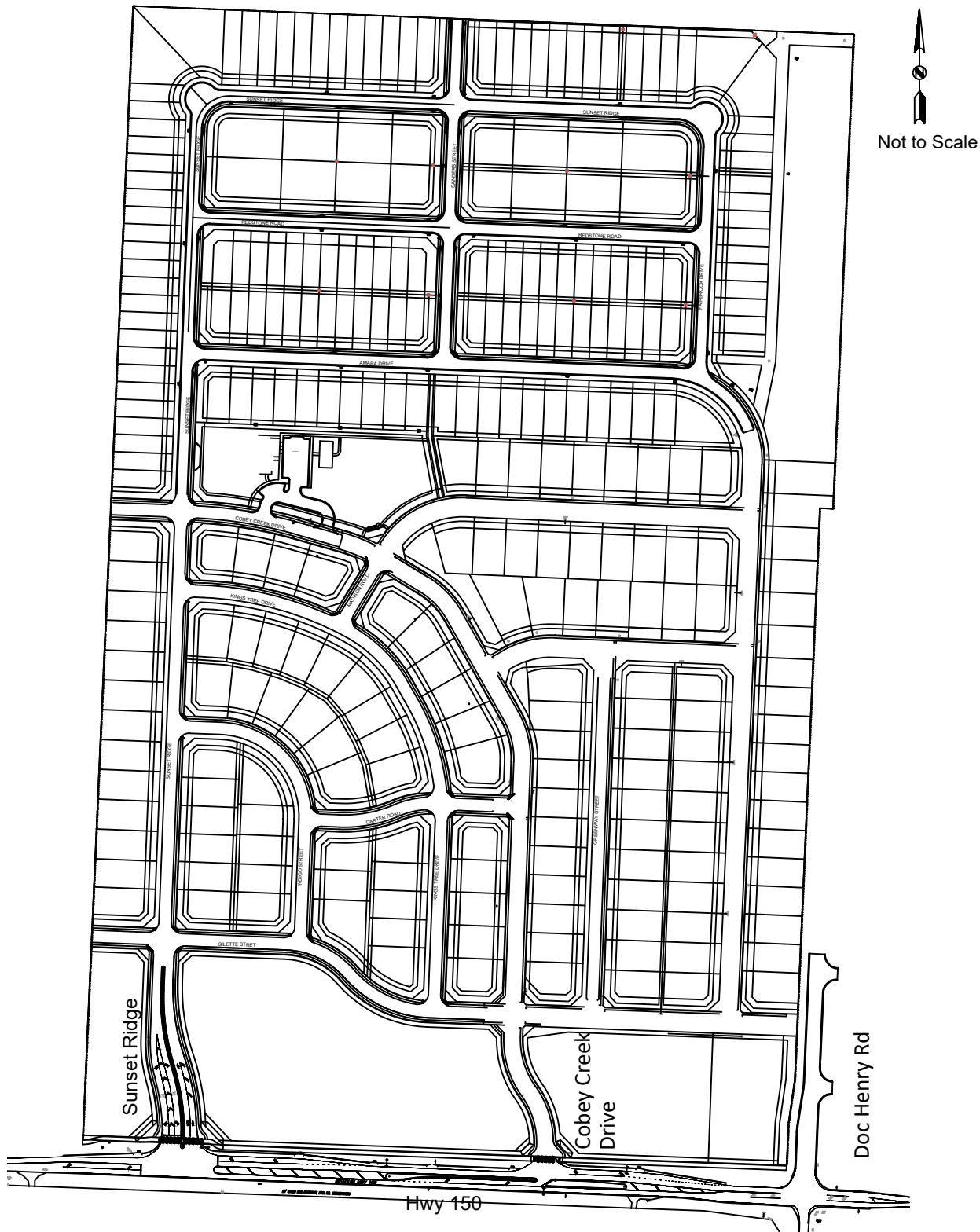


Figure 2 - Site Plan

EXISTING CONDITIONS

The site is located in Lee's Summit, Missouri, in the northwest quadrant of the intersection of Doc Henry Road and Highway 150. The current land use surrounding the planned development is residential to the east and undeveloped/rural to the north, south, and west.

Street Network and Traffic Control

The development is bordered on the east by Doc Henry Road and to the south by Highway 150. US 291 is ½ mile to the west of the proposed development. Access to the development will be from the existing Cobey Creek Drive and the proposed Sunset Ridge.

Highway 150 is a two-lane east-west highway with a posted speed limit of 45 miles per hour (mph) and open ditches for drainage.

Doc Henry Road is a two-lane north-south collector road with no centerline south of Highway 150. North of Highway 150, Doc Henry Road is a 500 feet roadway stub that is barricaded at the intersection of Highway 150. The posted speed limit south of Highway 150 is 35 mph. The intersection of Doc Henry Road and Highway 150 is stop-controlled, with Doc Henry Road stopping.

Cobey Creek Drive was constructed under the development's previous ownership. It is a two-lane north-south road that tees at Highway 150 with a posted speed limit of 25 mph. A 200-foot left turn lane into the development has been constructed on Highway 150 as part of the original design. The intersection is stop controlled with Cobey Creek Drive stopping.

Traffic Volumes

Intersections included in the analysis for this study are:

- Doc Henry Road and Highway 150

Previous turning movement traffic counts were completed on Wednesday, February 9th, 2022, for the peak volume time periods. Morning traffic counts were conducted from 7:00 A.M. until 9:00 A.M. and afternoon traffic counts were from 3:00 P.M. until 6:00 P.M. The morning peak period was determined to be from 7:15 A.M. until 8:15 A.M. and the afternoon peak period was determined to be from 4:30 P.M. until 5:30 P.M.

Updated turning movement traffic counts were completed on Wednesday, January 31st, 2024, for the peak volume time periods and the morning peak period was determined to be from 7:15 A.M. until 8:15 A.M. (a 15-minute shift from the 2022 counts) and the afternoon peak period was determined to be from 4:30 P.M. until 5:30 P.M. (the same time period as the 2022 counts).

On average, the 2022 counts were found to be between 1-2% lower overall than the April 2024 counts with individual movements fluctuating between 0-40% different. The higher 2024 traffic counts were used for the existing conditions traffic counts.

The 2024 traffic volumes are shown on Figure 3. The 2022 and 2024 traffic counts comparison is included in the Appendix.

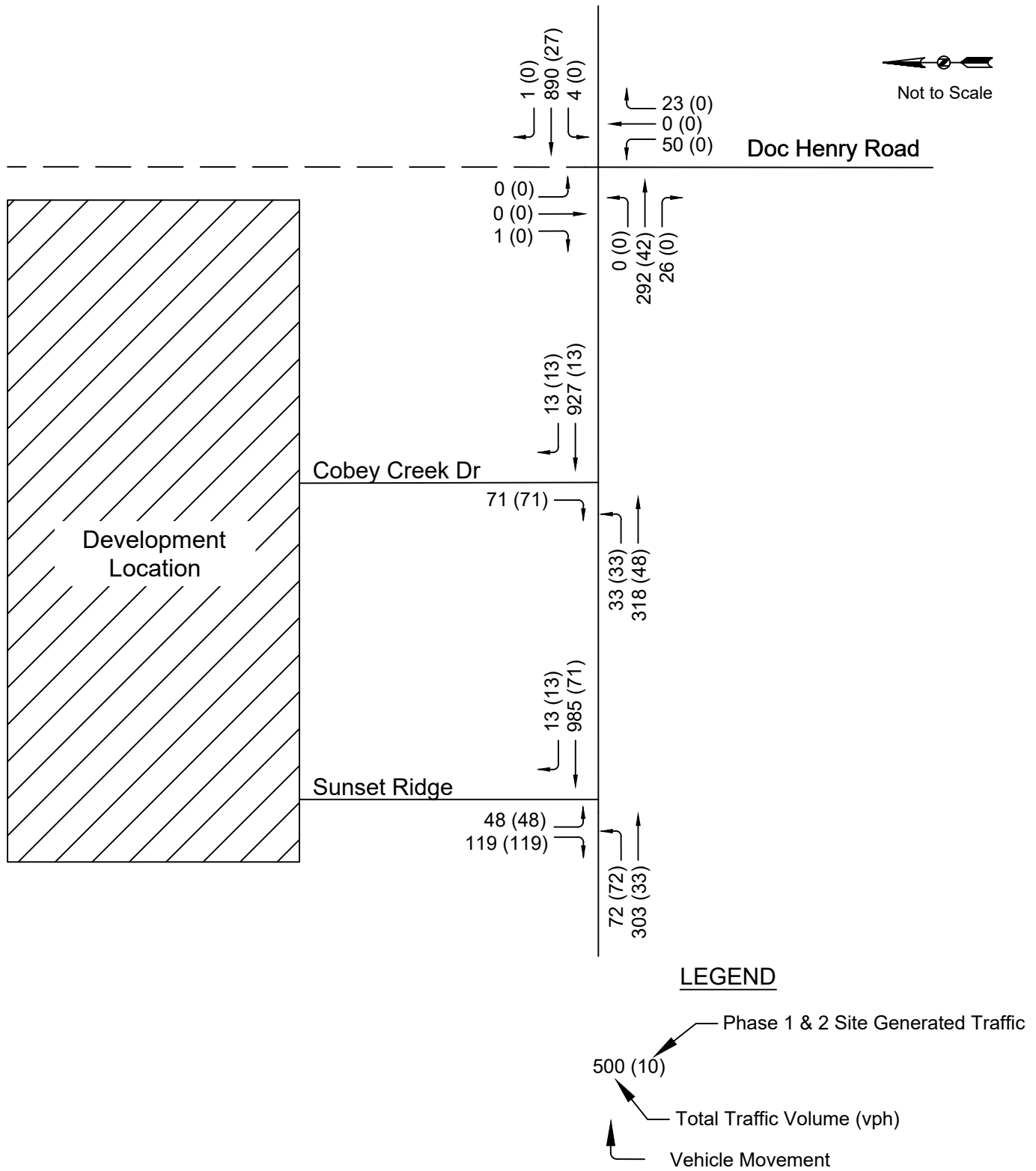


Figure 4 - Existing plus Site AM Volumes

PROPOSED CONDITIONS

The Cobey Creek development is planned to consist of residential units (209 single-family homes, 130 duplexes, and 48 quadplexes), one restaurant, a bank, and a retail site (assumed automobile parts store). The site is being developed in multiple phases, with the single-family homes being constructed first and the commercial being constructed at a future date. Analysis was originally completed with the site being separated into phases, but traffic improvements were triggered with the first phase so further analysis was completed with the development as a whole.

Access Plan

The site will be accessed via the existing Cobey Creek Drive and the proposed Sunset Ridge. Stub roads will be constructed to the north and west to provide future connections to surrounding developments. Sunset Ridge is being designed for the addition of a south leg to the intersection when the planned Ovations development south of Highway 150 is constructed.

Cobey Creek Drive will be converted to a $\frac{3}{4}$ access and Sunset Ridge will be a signalized full access drive (when warrants are met).

There are no planned connections to the east or to Doc Henry Road.

Sight Distance

Sight distance was measured at the proposed Sunset Ridge access into the site using the methodology recommending by the American Association of State Highway and Transportation Engineers (AASHTO). The posted speed limit along Highway 150 at the proposed access point is 45 mph and for that speed AASHTO requires a minimum intersection sight distance of 500 feet. Based on field measurements the available sight distance will be in excess of 500 feet and is adequate.

AASHTO requires a stopping sight distance of 360 feet for a roadway with a speed limit of 45 mph. The measured stopping sight distance is in excess of 500 feet and is adequate.

No sight distance was measured at Cobey Creek Drive as it is an existing roadway.

Crash Analysis

Crashes at the study intersections were analyzed over a five-year period (2019-2023) from Missouri Highway Patrol data to identify existing crash patterns. There were a total of four crashes reported during the crash study time period, and no fatal crashes within the study area.

Based on the analysis of the four crashes, there were two angle crashes, one sideswipe crash, and one pedestrian hit. The angle and sideswipe crashes were primarily due to inattentive drivers or failure to yield (stop sign). The

pedestrian crash resulted in non-life-threatening injuries and was caused by pedestrians walking in front of a vehicle on MO-150 without leaving sufficient time to cross.

No correctable crash patterns emerged as a result of the study and no recommendations are made to alter the study intersections based on crash data.

Detailed crash summaries are included in the Appendix.

Trip Generation

The expected trip generation for the development was estimated using the 11th Edition of the Trip Generation Handbook published by the Institute of Transportation Engineers. The trip generation was based on Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 AM along with Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 PM criteria.

Estimates for the expected trips generated by the development are provided in Table 2.

Table 1 – Trip Generation						
	Weekday		A.M.		P.M.	
ITE Land Use Code Units	Trips In (vpd)	Trips Out (vpd)	Trips In (vph)	Trips Out (vph)	Trips In (vph)	Trips Out (vph)
210—Single-Family Detached Housing 209 dwelling units	994	994	37	109	125	74
215—Single-Family Attached Housing 130 dwelling units	470	470	16	46	44	30
220—Multi-Family Housing (Low-Rise) 48 dwelling units	192	191	10	28	26	15
Phase I Total	1,656	1,656	63	183	195	119
843—Automobile Parts Sales 6,000 Sq Ft	150	149	8	7	14	15
912—Drive-In Bank 5,000 Sq Ft	251	251	29	21	53	53
932—High-Turnover (Sit-Down) Restaurant 6,000 Sq Ft	322	322	31	26	33	21
Phase II Total	723	722	68	54	100	89
Total	2,379	2,379	131	237	295	208

Trip Distribution

The trip distribution pattern was determined for the site based on the directional traffic pattern of the updated peak period traffic counts and based on a general analysis of the surrounding area. The detailed distribution patterns can be found in the appendix. Based on the existing traffic patterns, the type of development, and the metropolitan population centers, the new trips were assigned onto the roadway network as shown below for the morning and afternoon periods.

Trip distribution during the morning peak period:

- 20% to/from the east
- 80% to/from the west

Trip distribution during the afternoon peak period:

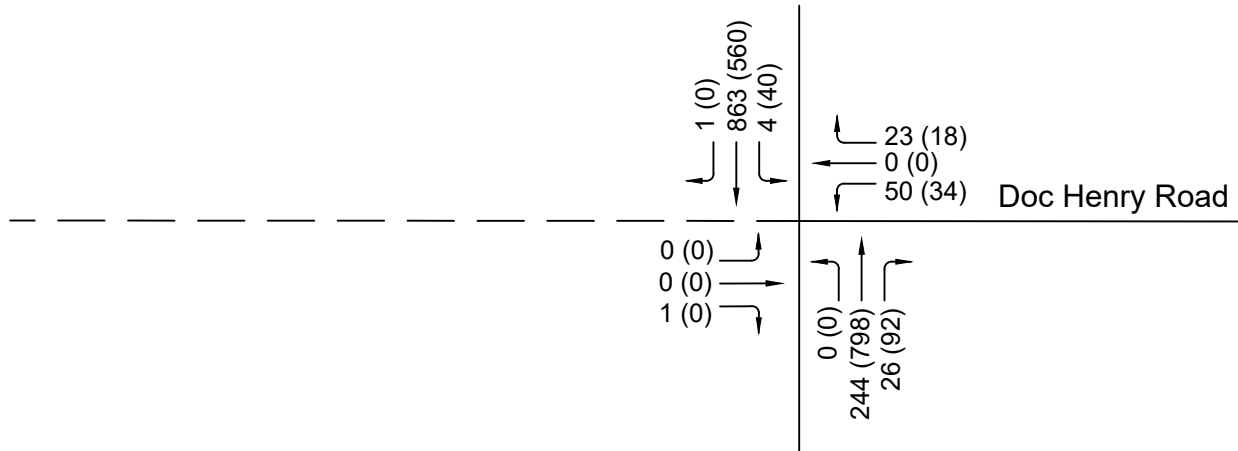
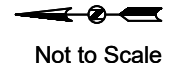
- 20% to/from the east
- 80% to/from the west

Existing Plus Site Traffic Volumes

The expected development site-generated traffic volumes were added to the existing traffic scenario. The volumes are shown on Figures 4 and 5.

Existing Plus Site and Ovations Site Traffic Volumes

A traffic study for the planned Ovations development, to be located south of Highway 150 at Sunset Ridge, is currently underway but has not yet been approved. The Ovations site will consist of 428 single-family attached dwellings and 300 multifamily (low-rise) dwellings. The expected site-generated traffic volumes for the Ovations development were added to the existing traffic volumes and the proposed site volumes at the study intersections and are shown on Figures 6 and 7.



LEGEND

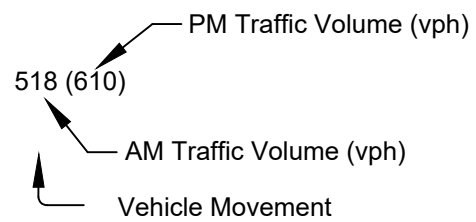
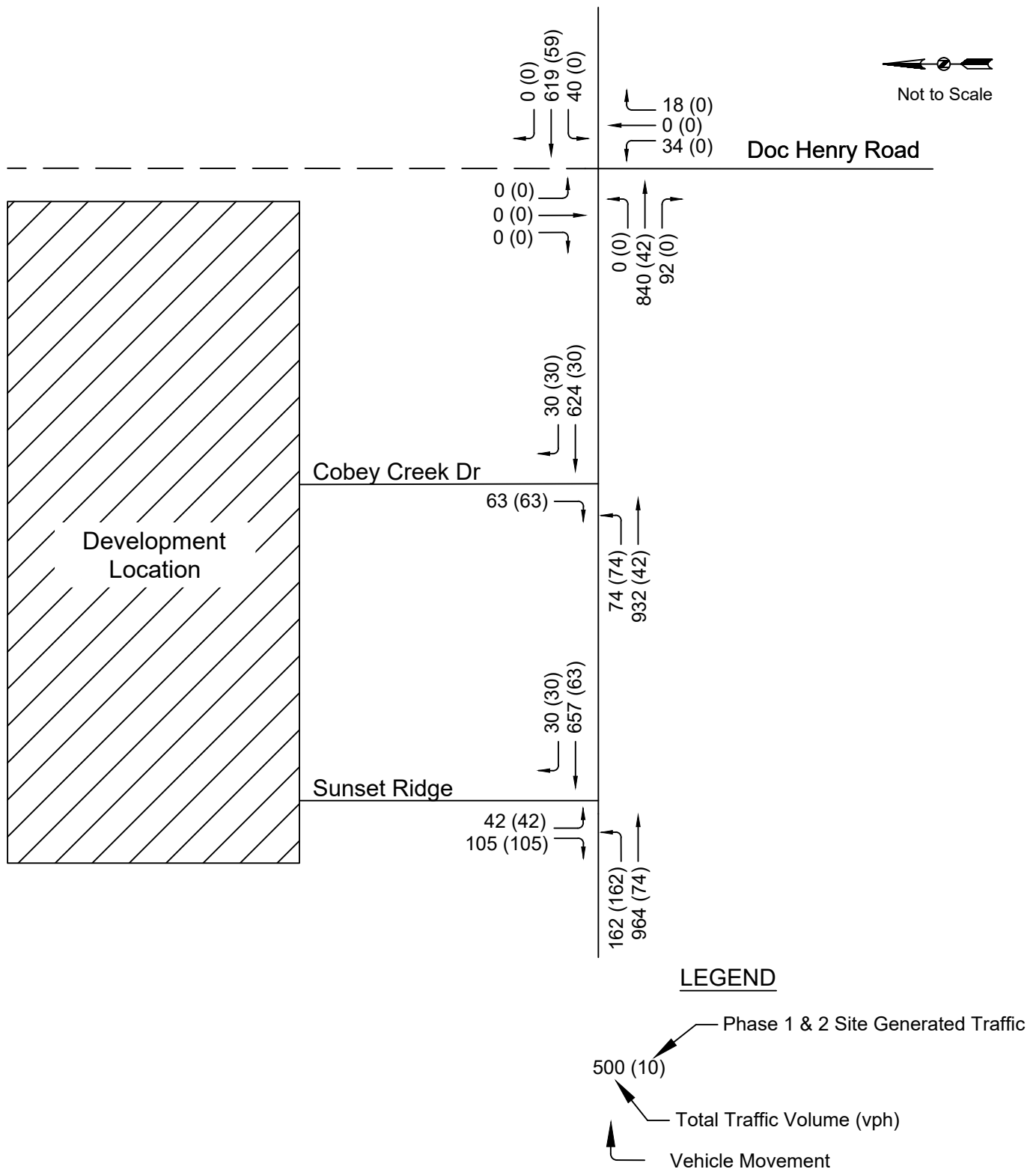


Figure 3 - Existing Traffic Volumes



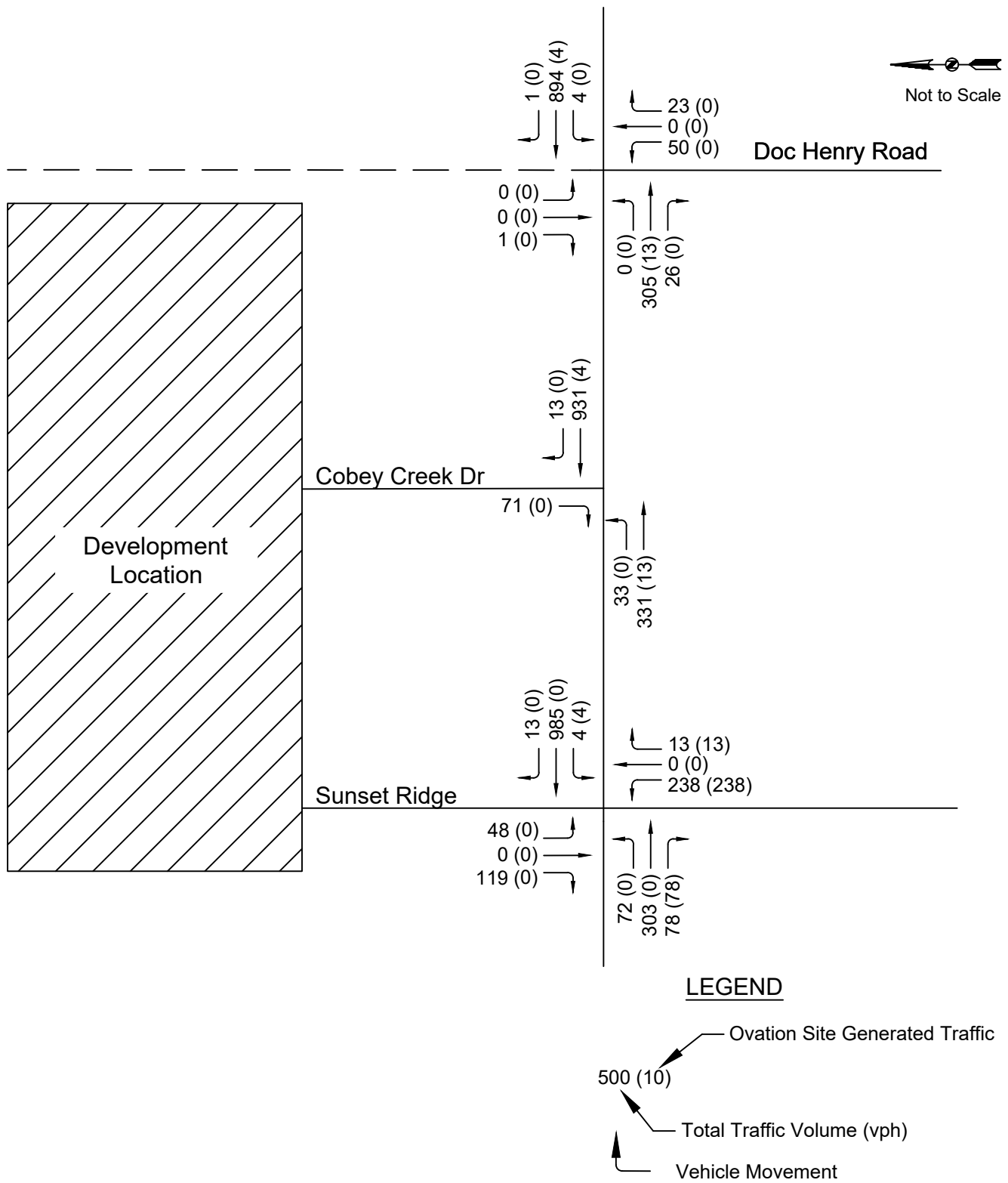


Figure 6 - Existing plus Site and Ovation Site AM Volumes

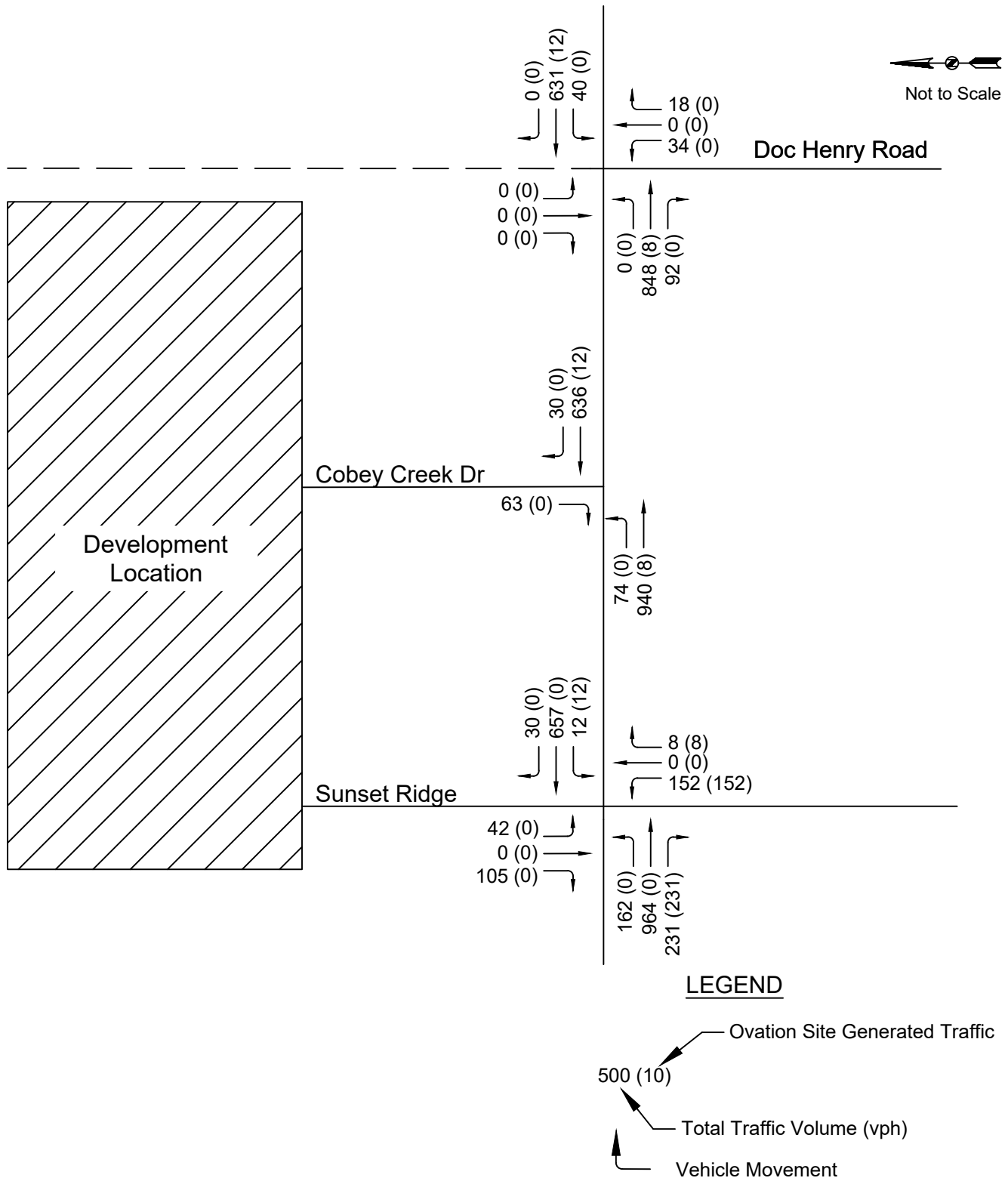


Figure 7 - Existing plus Site and Ovation Site PM Volumes

Signal Warrant Study

It may be considered justified to install a traffic signal at a location if one or more of the traffic signal warrants listed in the 2023 MUTCD is met. The traffic signal warrants are:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak Hour
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near at Grade Crossing

Warrant 3 was evaluated at Doc Henry Road and Highway 150 along with Sunset Ridge and Highway 150 as part of this study for the existing and existing plus site conditions.

Warrant 3: Peak Hour

The peak hour warrant is satisfied if either of the two following conditions are met:

A: This condition is satisfied if any of the following conditions are met for a period of one hour during an average day:

1. The total stopped time delay experience by the traffic on one minor-street approach (one direction only) controlled by a stop sign equals or exceeds: 4 vehicles-hours for a one-lane approach or five vehicle hours for a two-lane approach and
2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes and
3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

(Condition A is not being examined in this study)

B: The peak hour warrant is satisfied if the vehicles per hour on both approaches of the major street and the vehicles on the higher volume approach of the minor street for one hour fall above the 2009 MUTCD Warrant 3 curve.

Warrant Analysis

The traffic volumes at Doc Henry Road currently meet the 70% Factor for Warrant 3. It is expected that the Sunset Ridge and Highway 150 intersection will warrant a signal in the existing plus site conditions. The raw data and curves from the 2023 MUTCD are included in the Appendix.

Right-Turn and Left-Turn Lane Warrants

The need for right and left-turn lanes into the site entrances was evaluated using MoDOT's turning lane guidelines as part of this study for the existing plus condition.

Right-Turn Warrant

The traffic volumes are expected to meet the right-turning volume criteria at both the Cobey Creek Drive and Sunset Ridge intersections.

Left-Turn Warrant

The existing plus site traffic volumes are expected to warrant a left-turn lane during peak periods for the Sunset Ridge and Highway 150 intersection. There is an existing left-turn lane at Cobey Creek Drive.

The raw analysis data is included in the Appendix.

CAPACITY

The capacity analysis for the study intersections was completed using the methodology outlined in the Highway Capacity Manual, 6th Edition. The volume and capacity analysis was completed using Trafficware SYNCHRO software (latest version). The criteria for determining Level of Service (LOS) for signalized and unsignalized study intersections and access points are based on the average vehicle delay and is outlined in Table 3 below. Level of Service is defined as the measure of the quality of traffic flow and is graded from "A" to "F"—with "A" being the best situation and "F" being the worst.

Table 2 – Intersection Level of Service		
Level of Service (LOS)	Average Control Delay (sec/veh)	
	Unsignalized	Signalized
A	< 10	< 10
B	< 15	< 20
C	< 25	< 35
D	< 35	< 55
E	< 50	< 80
F	≥ 50	≥ 80

Existing Conditions

Doc Henry Road and Highway 150

The through movements of Highway 150 are not stop-controlled and are therefore operating in a free-flow condition. The eastbound right-turn and westbound left-turn movement onto Doc Henry Road operates at a LOS B or better and there is sufficient capacity for queuing vehicles. The northbound movements on Doc Henry Road operates at a LOS E during the morning and LOS F for the afternoon conditions, which is below the accepted LOS threshold.

The results of the capacity analysis for the existing morning and afternoon peak hour conditions along with lane configuration and queue lengths are shown on Figure 8.

Existing Plus Site Conditions

Doc Henry Road and Highway 150

As a signalized intersection: All approaches operate at a LOS C or better. Due to the morning and afternoon directional traffic, the east and westbound through movements experience longer queue lengths (495 feet westbound in the morning and 790 feet eastbound in the afternoon), however the intersection has sufficient capacity for queuing vehicles without backing into 20th Avenue to the east or Sunset Ridge to the west. Vehicles will still be able to utilize the left-turn lane at Cobey Creek Drive and as the intersection is a $\frac{3}{4}$ access the right-turns will be unaffected.

Cobey Creek Drive and Highway 150

The analysis was completed with $\frac{3}{4}$ access, the existing 200 feet eastbound left-turn lane, and a new westbound 150 feet right-turn lane. All movements operate a LOS C or better, and there is sufficient capacity for queuing vehicles.

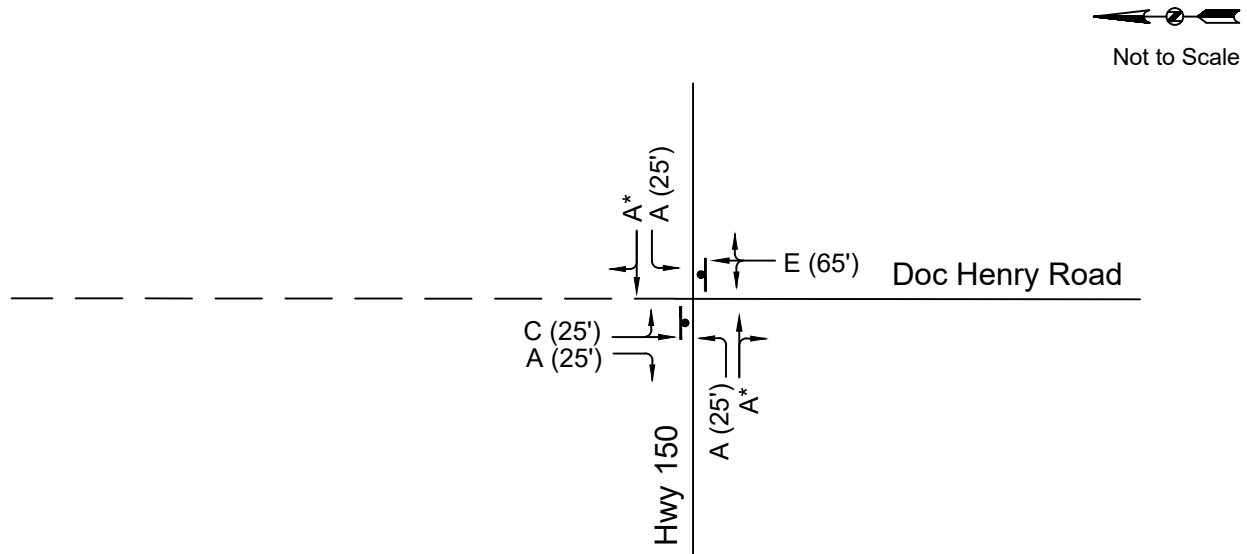
Sunset Ridge and Highway 150

The analysis was completed with a 180 feet eastbound left-turn lane and westbound 190 feet right-turn lane as both are warranted based on MoDOT turn lane criteria.

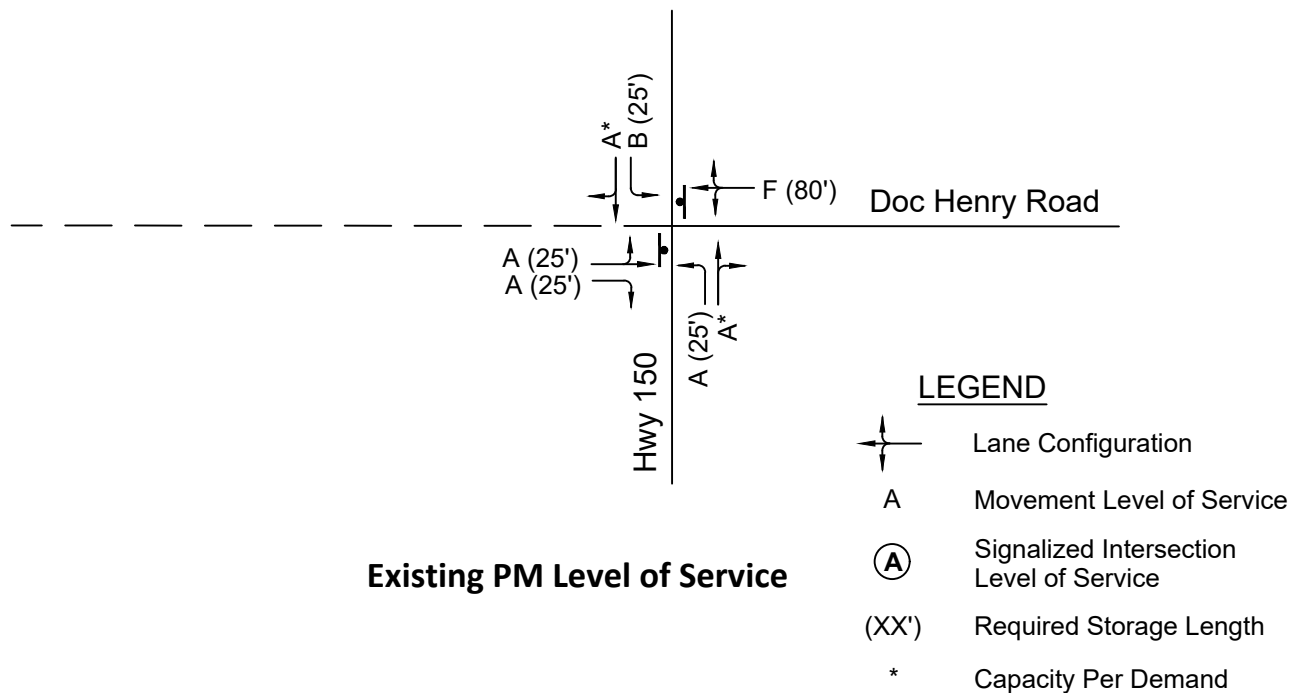
As a stop-controlled intersection: The southbound left-turn movement operates at a LOS F for both the morning and afternoon peak periods.

As a signalized intersection: All approaches operate at a LOS C or better, and the intersection has sufficient capacity for queuing vehicles.

The results of the analysis is shown for the morning and afternoon peak hour conditions along with lane configuration and queue lengths on Figures 9 and 10.



Existing AM Level of Service



Existing PM Level of Service

Figure 8 - Existing AM & PM Level of Service

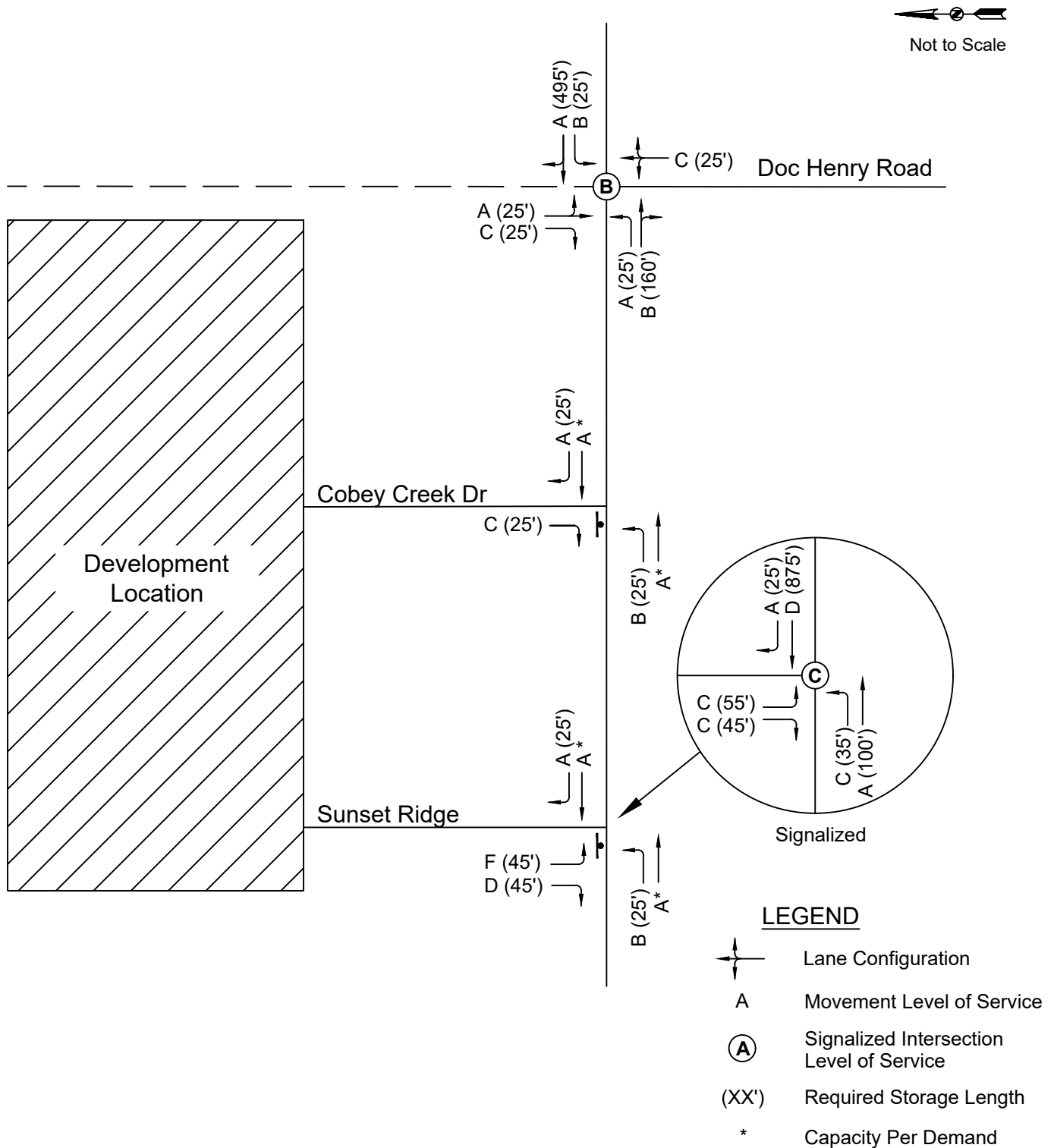


Figure 9 - Existing plus Site AM Level of Service

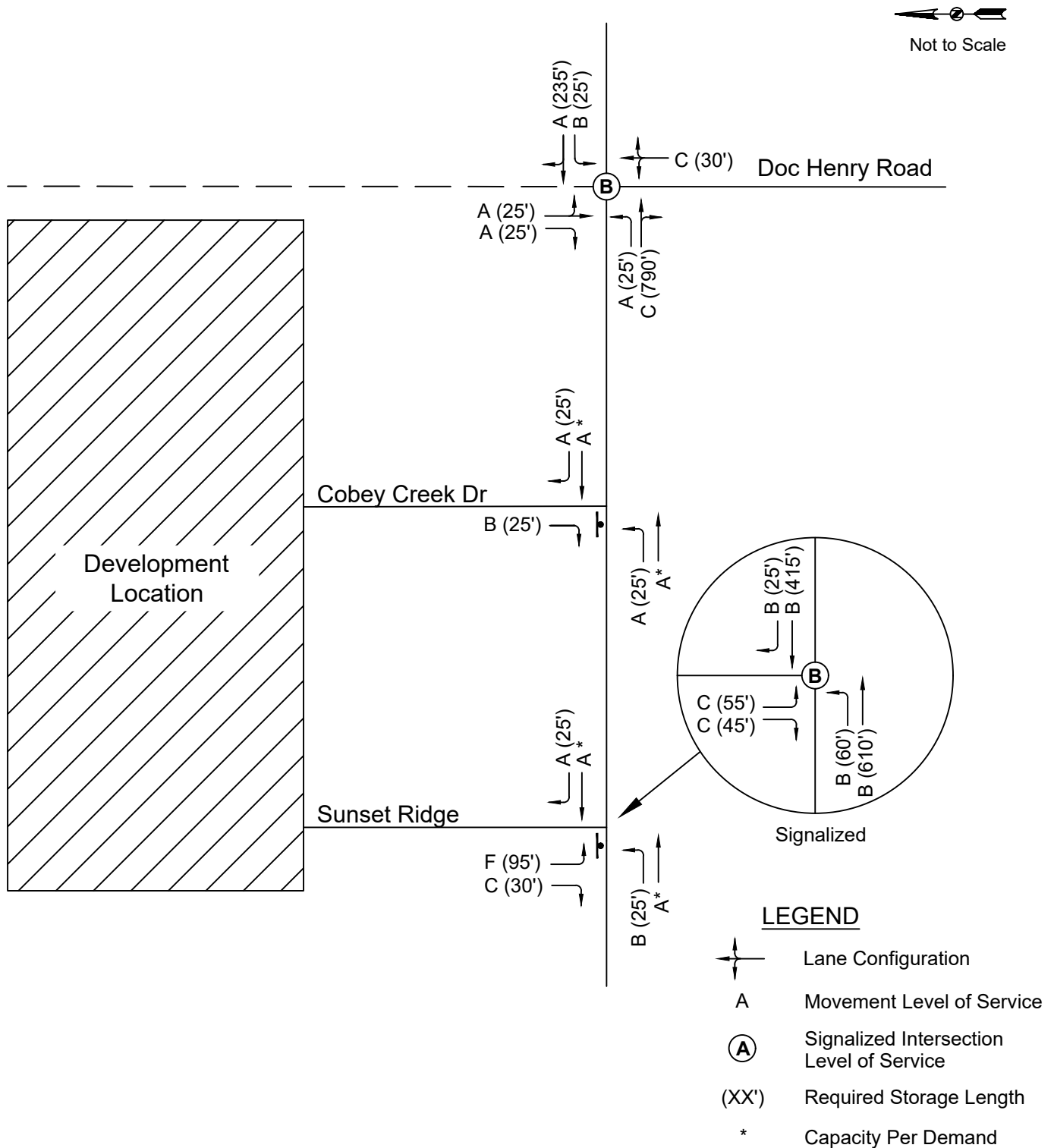


Figure 10 - Existing plus Site PM Level of Service

Existing plus Site and Ovations Site Conditions

Doc Henry Road and Highway 150

There is no significant change in operations for this intersection from the signalized Existing Plus Site Conditions—all movements operate at a LOS C or better and there is sufficient capacity for queueing vehicles.

Cobey Creek Drive and Highway 150

There is no significant change in operations for this intersection from the signalized Existing Plus Site Conditions—all movements operate at a LOS C or better and there is sufficient capacity for queueing vehicles.

Sunset Ridge and Highway 150

The analysis was completed with the addition of a northbound left-turn lane, a shared through/right-turn lane, and the signal timings were optimized to account for the additional leg of the intersection. All movements operate at a LOS D or better and there is sufficient capacity for queueing vehicles.

The results of the future analysis is shown for the morning and afternoon peak hour conditions along with lane configuration and queue lengths on Figures 11 and 12.

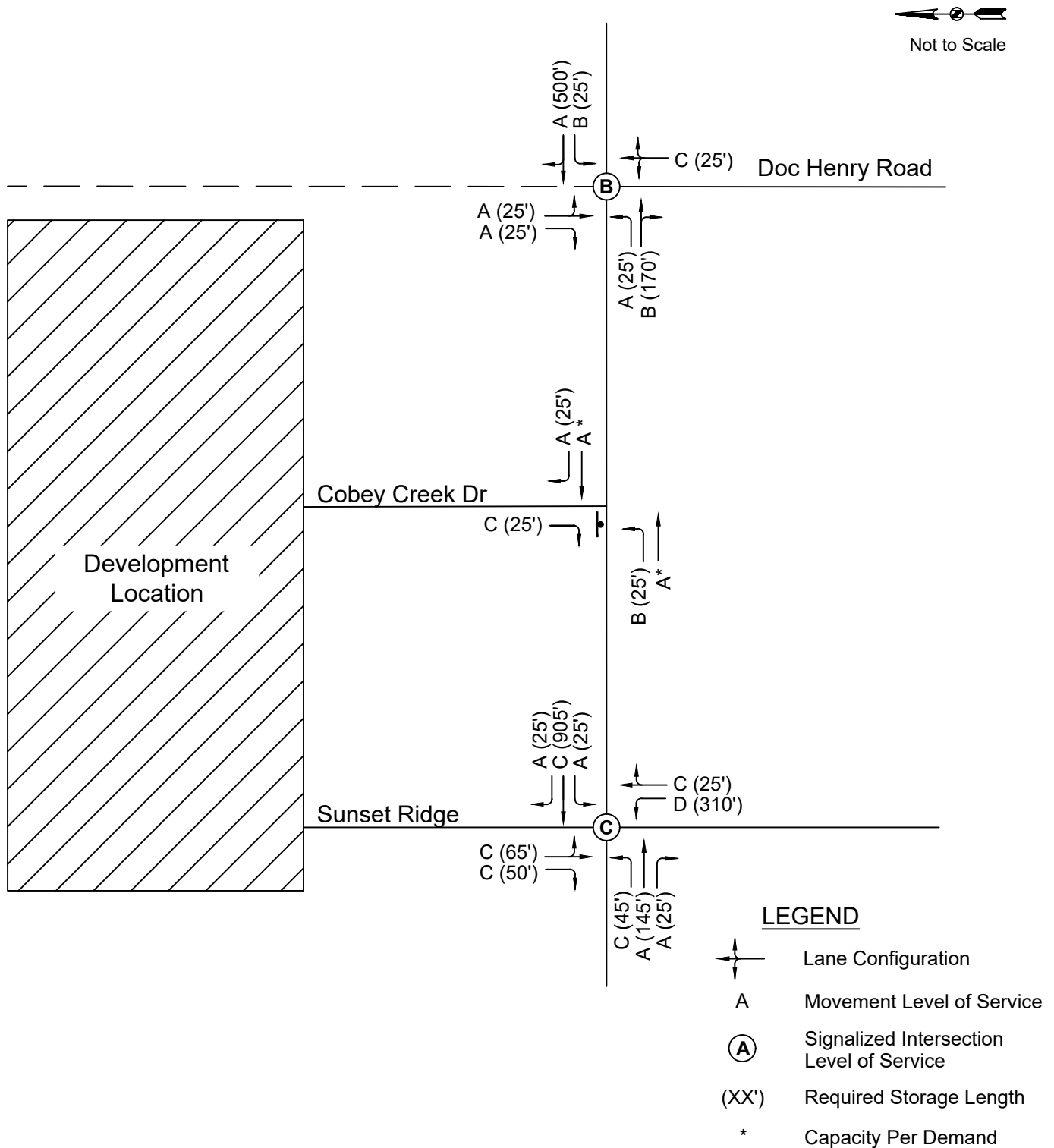


Figure 11 - Existing plus Site and Ovations Site AM Level of Service

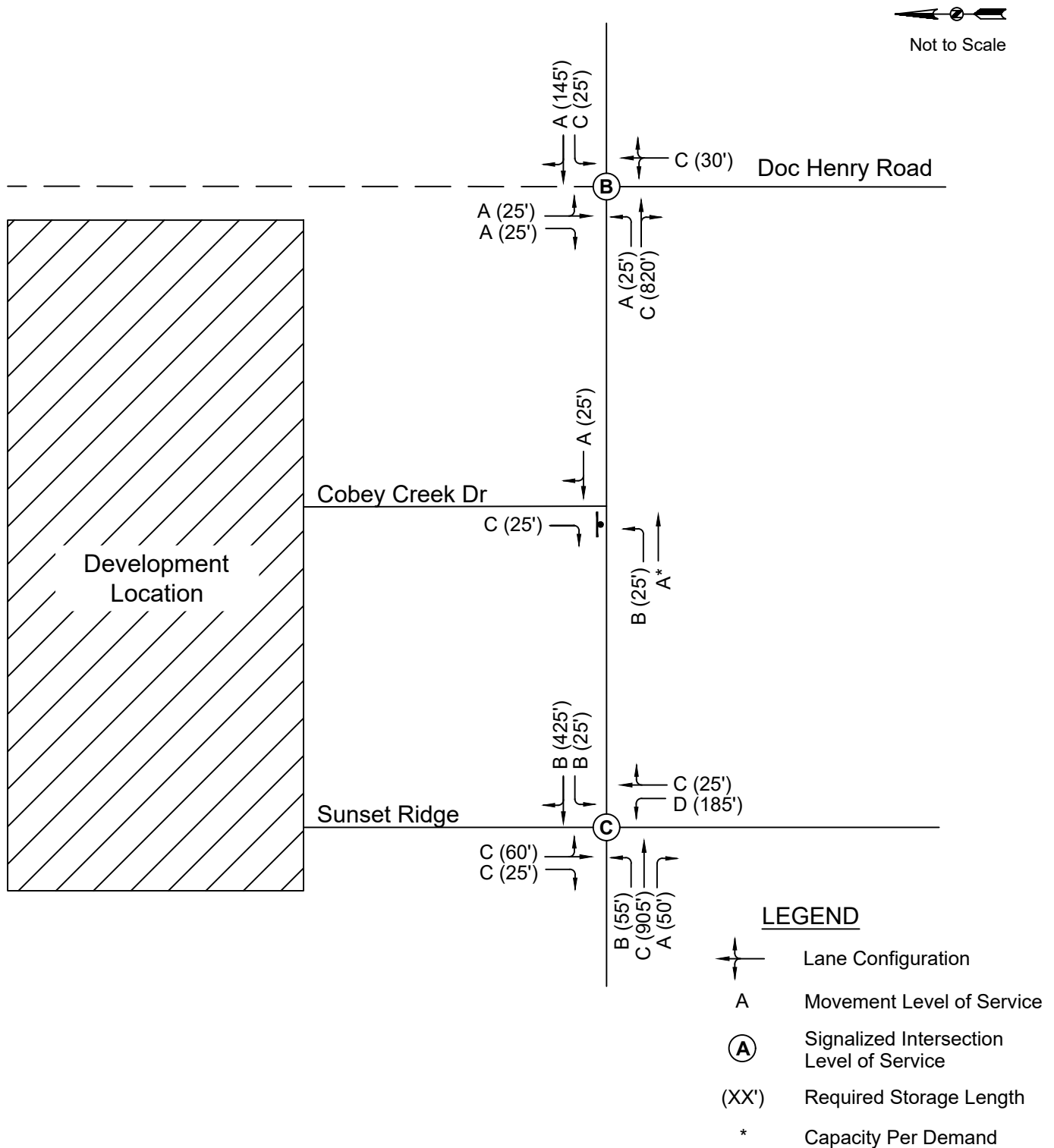


Figure 12 - Existing plus Site and Ovations Site PM Level of Service

RECOMMENDATIONS

This study documents the findings of the traffic analysis of the expected traffic for the Cobey Creek development in Lee's Summit, Missouri. The study includes analysis of the existing conditions and existing plus site conditions.

Based on the results of the SYNCHRO analysis, observations from the field, and engineering judgment the following recommendations are made:

- Discuss construction of a signal at Doc Henry Road and Highway 150 with appropriate stakeholders.
- Construct a westbound right-turn lane (150 feet of storage with a 100-foot taper) and a concrete median to prevent left-turns out at Cobey Creek Drive and Highway 150.
- Construct a westbound right-turn lane (190 feet of storage with a 100-foot taper), an eastbound left-turn lane (180 feet of storage with a 100-foot taper), and signalize the intersection of Sunset Ridge and Highway 150. The traffic signal should be designed to accommodate the future south leg of the intersection as part of the Ovations development roadway improvements.

APPENDIX

Doc Henry and MO 150
AM

Time	Eastbound				Westbound				Northbound				Southbound				Int. Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
7:00	0	46	3	49	1	205	0	206	19	0	8	27	0	0	0	0	282
7:15	0	65	4	69	1	231	0	232	15	0	5	20	0	0	0	0	321
7:30	0	57	14	71	1	216	1	218	8	0	5	13	0	0	1	1	303
7:45	0	76	5	81	1	211	0	212	8	0	5	13	0	0	0	0	306
8:00	1	51	8	60	0	161	0	161	14	0	3	17	0	0	1	1	239
8:15	0	93	1	94	4	122	0	126	6	0	12	18	0	0	0	0	238
8:30	0	84	4	88	2	136	0	138	11	0	9	20	0	0	0	0	246
8:45	0	108	3	111	3	154	0	157	13	0	5	18	0	0	0	0	286
Total	1	580	42	623	13	1436	1	1450	94	0	52	146	0	0	2	2	2221

PHF																					Int. Total
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	
7:00	0	46	3	49	0.83	1	205	0	206	0.94	19	0	8	27	0.68	0	0	0	0	0.25	282
7:15	0	65	4	69		1	231	0	232		15	0	5	20		0	0	0	0		321
7:30	0	57	14	71		1	216	1	218		8	0	5	13		0	0	1	1		303
7:45	0	76	5	81		1	211	0	212		8	0	5	13		0	0	0	0		306
Total	0	244	26	270		4	863	1	868		50	0	23	73		0	0	1	1		1212

Doc Henry and MO 150
PM

Time	Eastbound				Westbound				Northbound				Southbound				Int. Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
4:00	0	175	13	188	8	132	0	140	4	0	4	8	0	0	0	0	336
4:15	0	180	20	200	12	144	0	156	14	0	9	23	0	0	0	0	379
4:30	0	197	20	217	7	154	0	161	10	0	8	18	0	0	0	0	396
4:45	0	214	13	227	6	135	0	141	6	0	4	10	0	0	0	0	378
5:00	0	178	20	198	13	151	0	164	8	0	5	13	0	0	0	0	375
5:15	0	209	39	248	14	120	0	134	10	0	1	11	0	0	0	0	393
5:30	0	194	33	227	7	130	0	137	6	0	2	8	0	0	0	0	372
5:45	0	187	31	218	16	131	0	147	10	0	9	19	0	0	0	0	384
Total	0	1534	189	1723	83	1097	0	1180	68	0	42	110	0	0	0	0	3013

PHF																					Int. Total
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	
4:30	0	197	20	217	0.9	7	154	0	161	0.91	10	0	8	18	0.72	0	0	0	0	#DIV/0!	396
4:45	0	214	13	227		6	135	0	141		6	0	4	10		0	0	0	0		378
5:00	0	178	20	198		13	151	0	164		8	0	5	13		0	0	0	0		375
5:15	0	209	39	248		14	120	0	134		10	0	1	11		0	0	0	0		393
Total	0	798	92	890		40	560	0	600		34	0	18	52		0	0	0	0		1542

1/31/2024

Doc Henry and MO 150
AM

Time	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
7:00	0	46	3	49	1	205	0	206	19	0	8	27	0	0	0	0	282
7:15	0	65	4	69	1	231	0	232	15	0	5	20	0	0	0	0	321
7:30	0	57	14	71	1	216	1	218	8	0	5	13	0	0	1	1	303
7:45	0	76	5	81	1	211	0	212	8	0	5	13	0	0	0	0	306
Total	0	244	26	270	4	863	1	868	50	0	23	73	0	0	1	1	1212

2/9/2022

Doc Henry and MO 150
AM

Time	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
7:15	0	61	5	66	0	220	0	220	13	0	5	18	0	0	0	0	304
7:30	0	77	7	84	0	209	0	209	19	0	6	25	0	0	0	0	318
7:45	0	83	7	90	1	182	0	183	15	0	7	22	0	0	0	0	295
8:00	0	92	6	98	2	161	0	163	7	0	8	15	0	0	0	0	276
Total	0	313	25	338	3	772	0	775	54	0	26	80	0	0	0	0	1193

	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
2024 Summary	0	244	26	270	4	863	1	868	50	0	23	73	0	0	1	1	1212
2022 Summary	0	313	25	338	3	772	0	775	54	0	26	80	0	0	0	0	1193
Numerical Diff	0	-69	1	-68	1	91	1	93	-4	0	-3	-7	0	0	1	1	19
Percent Diff	0	-22%	4%	-20%	33%	12%	0	12%	-7%	0	-12%	-9%	0	0	0	0	2%

1/31/2024

Doc Henry and MO 150
AM

Time	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
4:30	0	197	20	217	7	154	0	161	10	0	8	18	0	0	0	0	396
4:45	0	214	13	227	6	135	0	141	6	0	4	10	0	0	0	0	378
5:00	0	178	20	198	13	151	0	164	8	0	5	13	0	0	0	0	375
5:15	0	209	39	248	14	120	0	134	10	0	1	11	0	0	0	0	393
Total	0	798	92	890	40	560	0	600	34	0	18	52	0	0	0	0	1542

2/9/2022

Doc Henry and MO 150
AM

Time	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
4:30	0	170	12	182	7	140	0	147	12	0	5	17	0	0	0	0	346
4:45	0	215	19	234	3	145	0	148	9	0	9	18	0	0	0	0	400
5:00	0	214	19	233	13	128	0	141	6	0	11	17	0	0	0	0	391
5:15	0	196	17	213	6	158	0	164	12	0	5	17	0	0	0	0	394
Total	0	795	67	862	29	571	0	600	39	0	30	69	0	0	0	0	1531

	EB Left	EB Thru	EB Right	EB Total	WB Left	WB Thru	WB Right	WB Total	NB Left	NB Thru	NB Right	NB Total	SB Left	SB Thru	SB Right	SB Total	Int. Total
2024 Summary	0	798	92	890	40	560	0	600	34	0	18	52	0	0	0	0	1542
2022 Summary	0	795	67	862	29	571	0	600	39	0	30	69	0	0	0	0	1531
Numerical Diff	0	3	25	28	11	-11	0	0	-5	0	-12	-17	0	0	0	0	11
Percent Diff	0	0%	37%	3%	38%	-2%	0	0%	-13%	0	-40%	-25%	0	0	0	0	1%

Cobey Creek Site Trip Generation

ITE Trip Generation Manual - 11th Edition

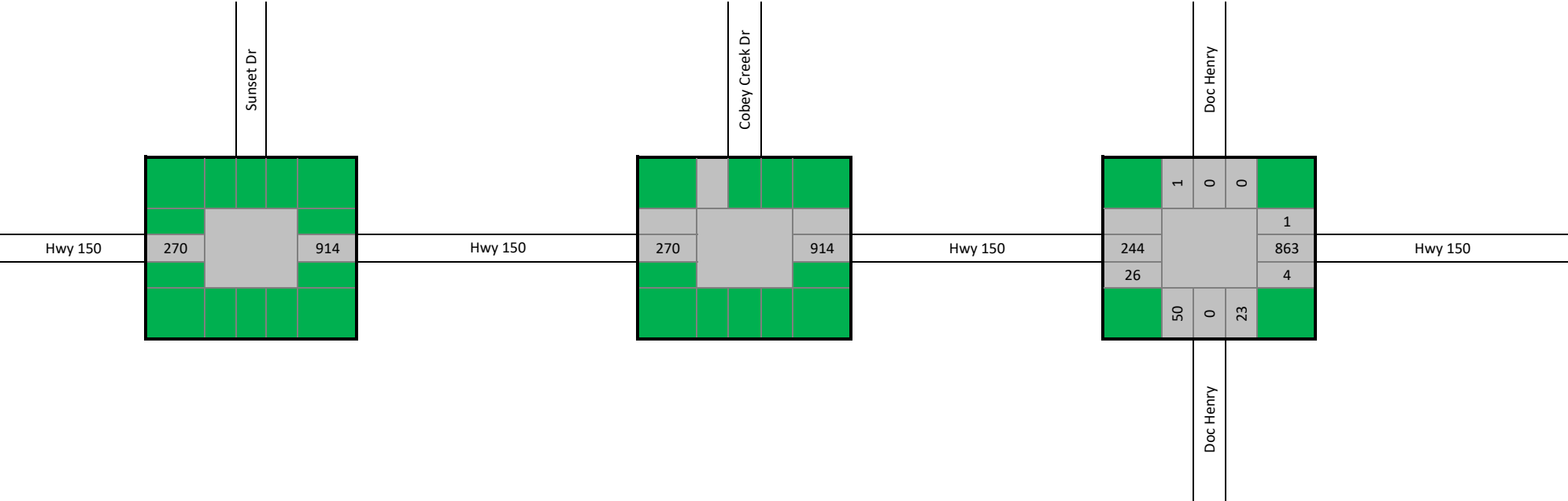
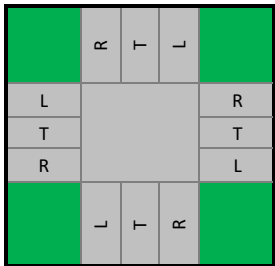
Highlighted text indicates trips used in Synchro and Warrant Analysis

Land Use	ITE Code	Size	Units	Equation	Trips (Eq.)	Av. Rate	Trips (Av. Rate)	In%	Out%	Trips In	Trips Out
Phase I											
Single- Family Detached Housing (Weekday)	210	209	Dwelling Units	$\ln(T)=0.92\ln(X)+2.68$	1988	9.43	1971	50%	50%	994	994
Single- Family Attached Housing	215	130	Dwelling Units	$T=7.62(X)-50.48$	940	7.2	936	50%	50%	470	470
Multi-Family Housing (Low-Rise)	220	48	Dwelling Units	$T=6.41(X)-75.31$	383	6.74	324	50%	50%	192	191
										1656	1655
Single-Family Detached Housing (AM)	210	209	Dwelling Units	$\ln(T)=0.91\ln(X)+0.12$	146	0.7	146	25%	75%	37	109
Single- Family Attached Housing	215	130	Dwelling Units	$T=0.52(X)-5.70$	62	0.48	62	25%	75%	16	46
Multi-Family Housing (Low-Rise)	220	48	Dwelling Units	$T=0.31(X)+22.85$	38	0.4	19	27%	76%	10	28
										63	183
Single-Family Detached Housing (PM)	210	209	Dwelling Units	$\ln(T)=0.94\ln(X)+0.27$	199	0.94	196	63%	37%	125	74
Single- Family Attached Housing	215	130	Dwelling Units	$T=0.60(X)-3.93$	74	0.57	74	59%	41%	44	30
Multi-Family Housing (Low-Rise)	220	48	Dwelling Units	$T=0.43(X)+20.55$	41	0.51	24	63%	37%	26	15
										195	119
Phase II											
Automobile Parts Sales (Weekday)	843	6	1000 Sq. Ft.	$T=71.05(X)-127.72$	299	54.57	327	50%	50%	150	149
Drive-In Bank	912	5	1000 Sq. Ft.	n/a		100.35	502	50%	50%	251	251
High-Turnover (Sit-Down) Restaurant	932	6	1000 Sq. Ft.	n/a		107.2	643	50%	50%	322	322
										723	722
Automobile Parts Sales (AM)	843	6	1000 Sq. Ft.	n/a		2.51	15	55%	45%	8	7
Drive-In Bank	912	5	1000 Sq. Ft.	n/a		9.95	50	58%	42%	29	21
High-Turnover (Sit-Down) Restaurant	932	6	1000 Sq. Ft.	n/a		9.57	57	55%	45%	31	26
										68	54
Automobile Parts Sales (PM)	843	6	1000 Sq. Ft.	n/a		4.9	29	48%	52%	14	15
Drive-In Bank	912	5	1000 Sq. Ft.	n/a		21.01	105	50%	50%	53	53
High-Turnover (Sit-Down) Restaurant	932	6	1000 Sq. Ft.	n/a		9.05	54	61%	39%	33	21
										100	89

Existing AM Peak Hour Traffic Counts

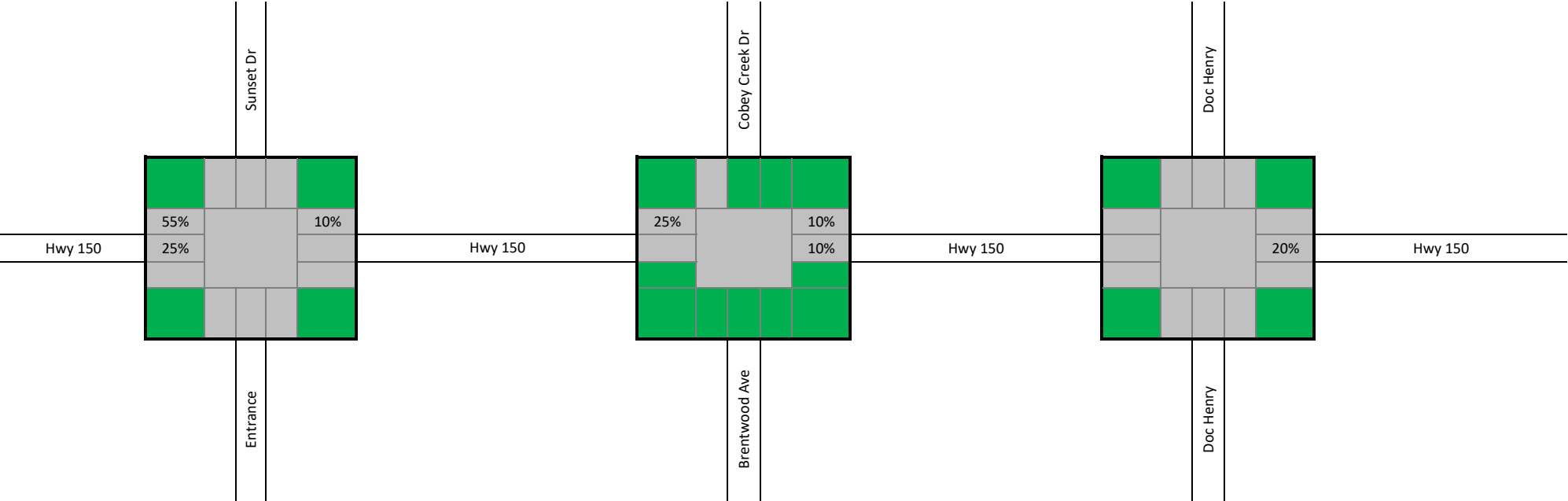
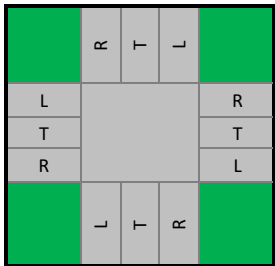
Counts from Jan 2024

Legend



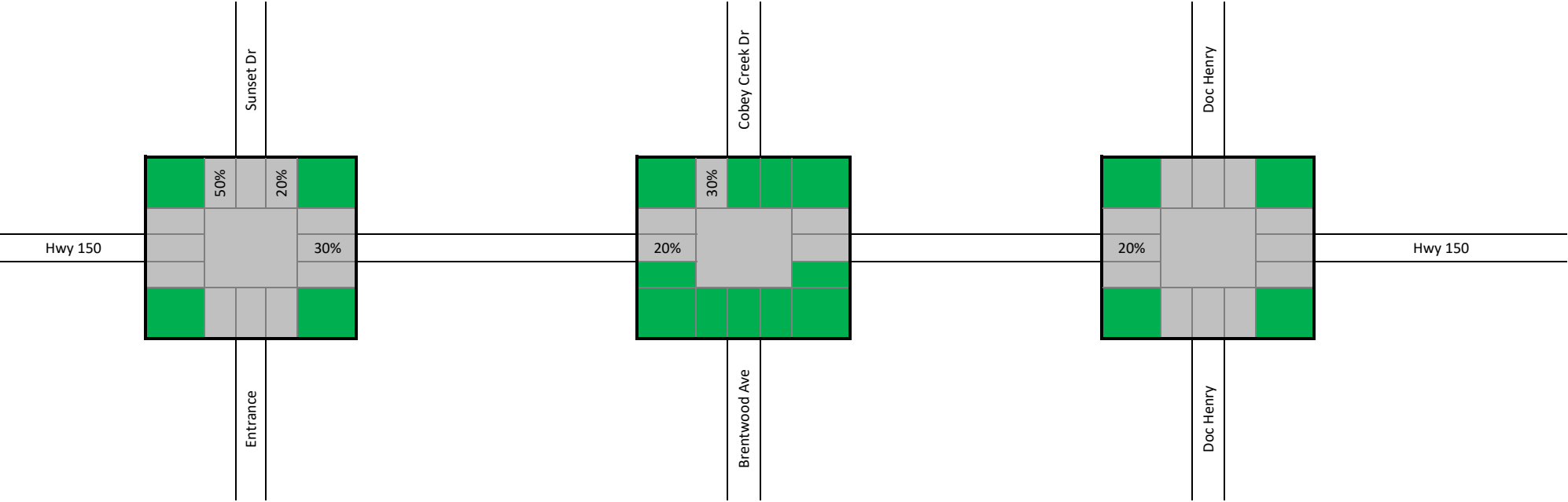
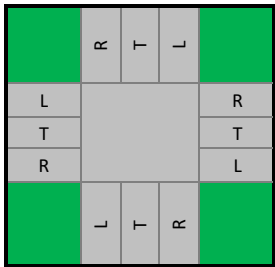
AM Distribution In Phase I

Legend



AM Distribution Out Phase I

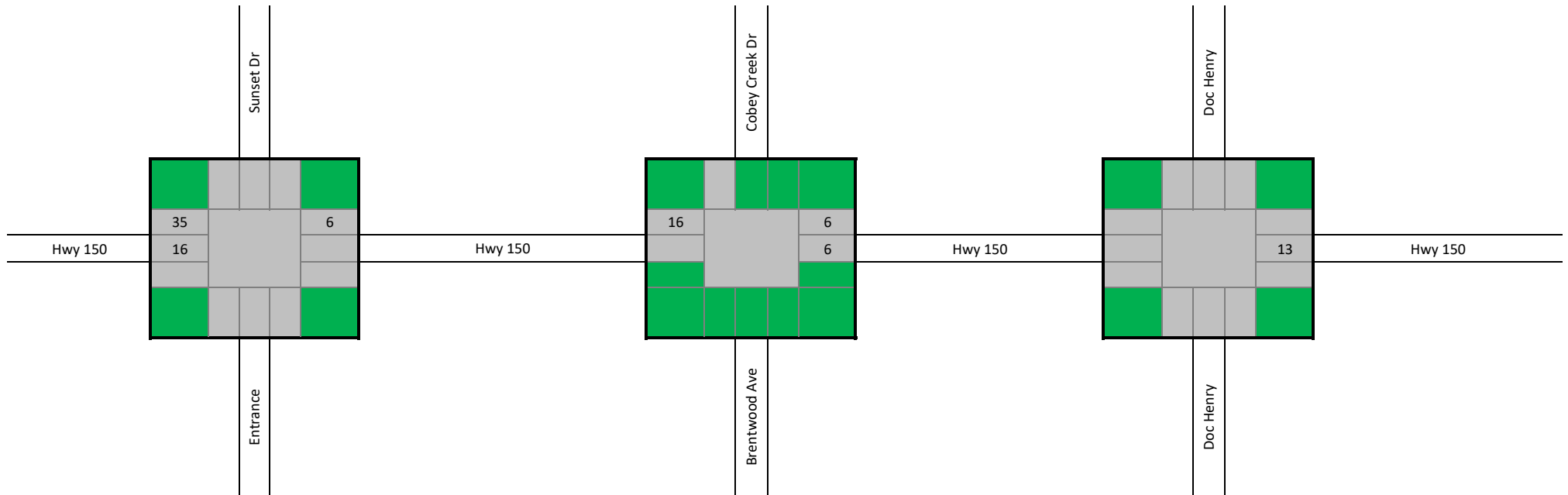
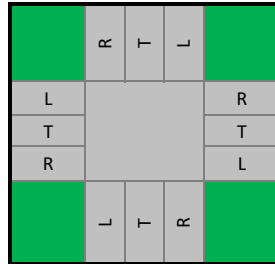
Legend



AM Trips In Phase I

Trips
63

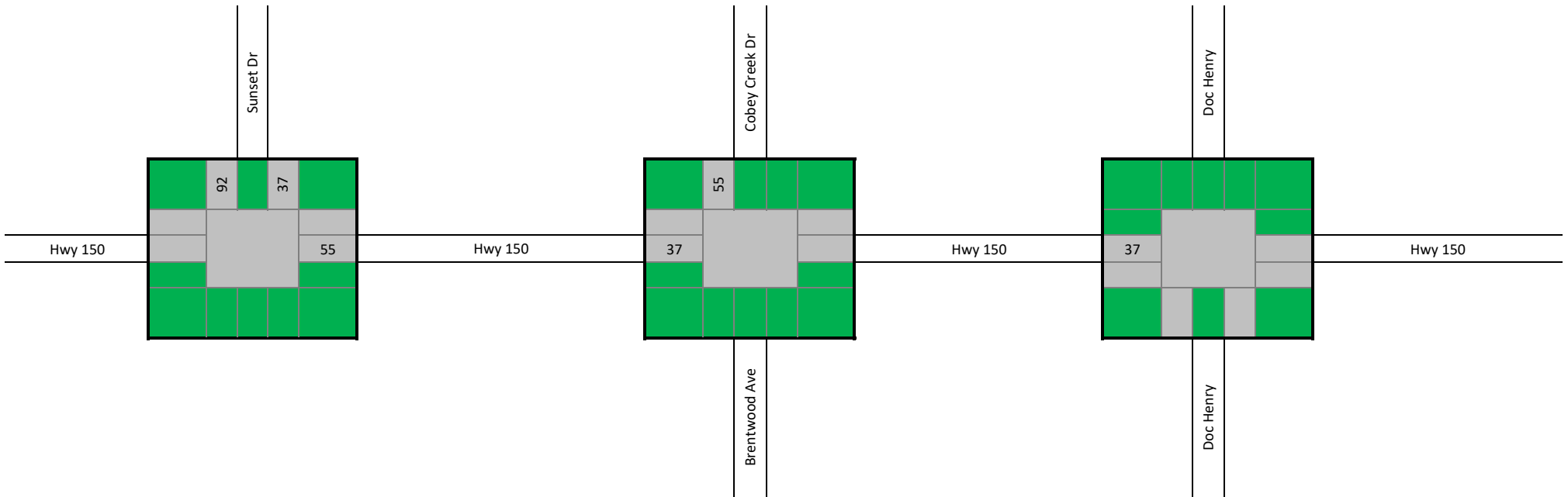
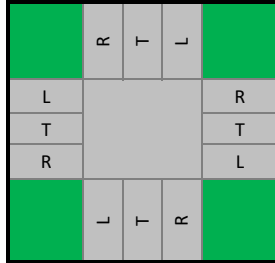
Legend



AM Trips Out Phase I

Trips
183

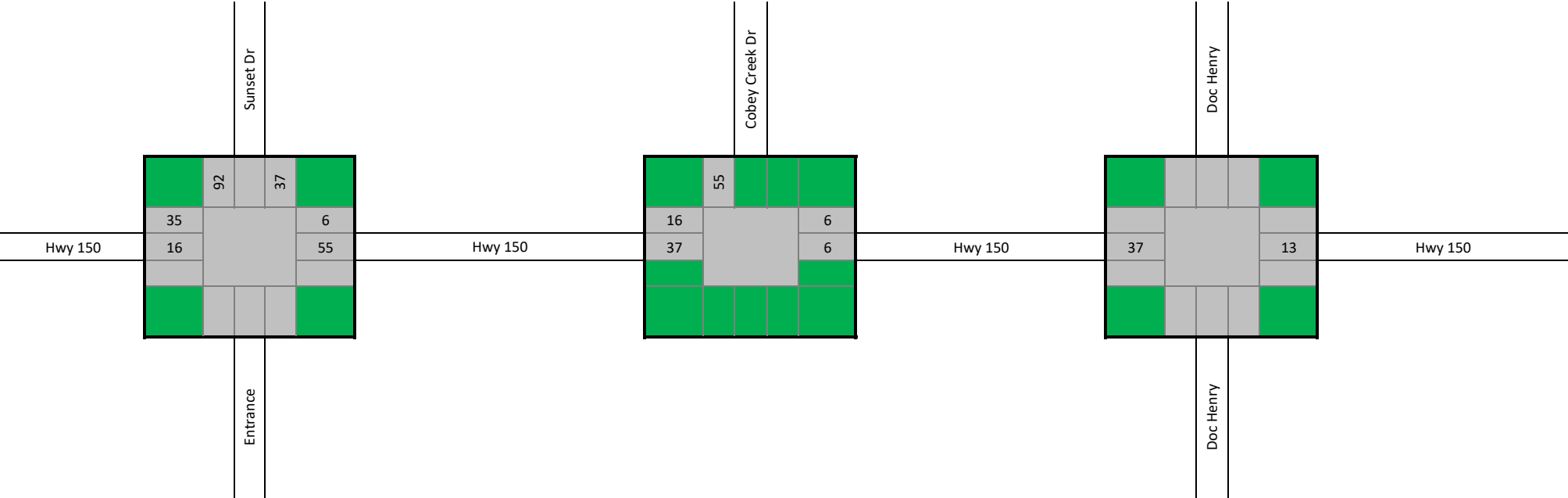
Legend



AM Trips Phase I

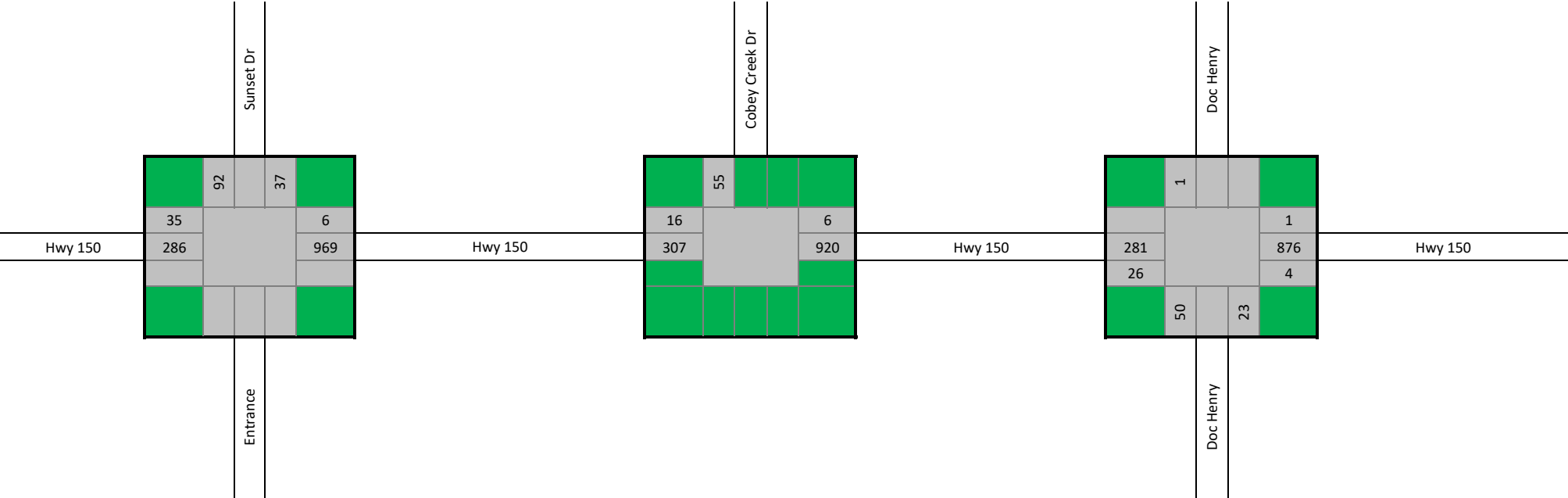
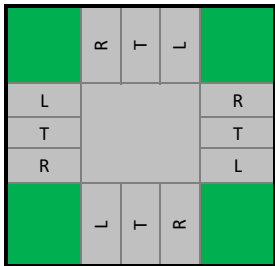
Legend

	R	T	L	
L				R
T				T
R				L
	L	T	R	



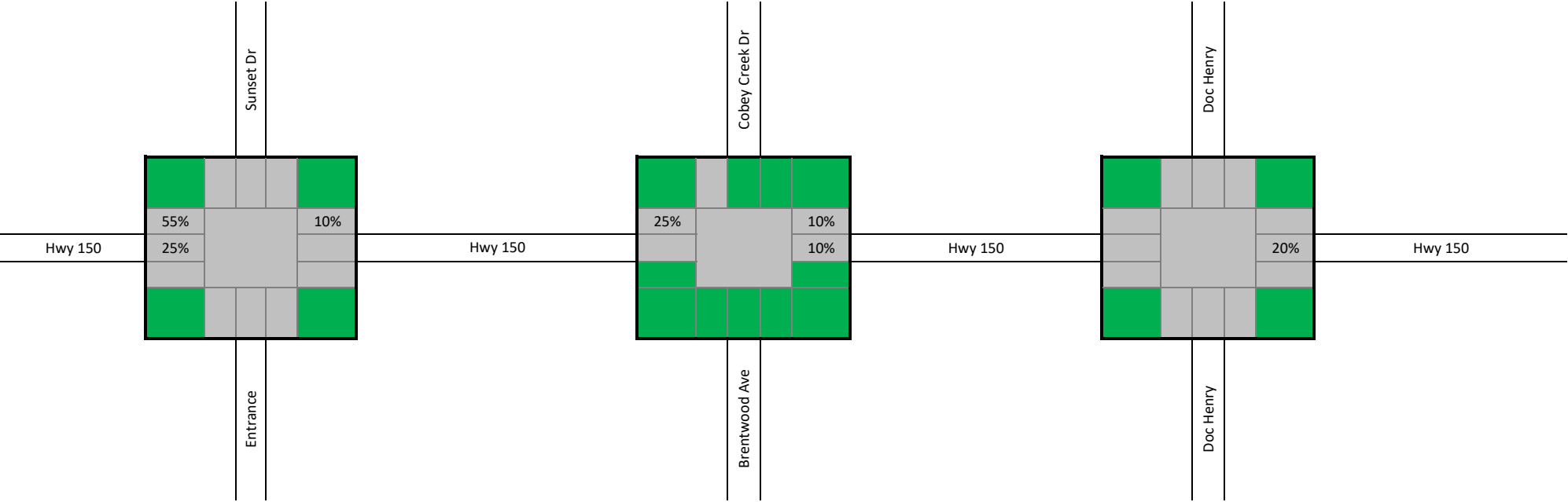
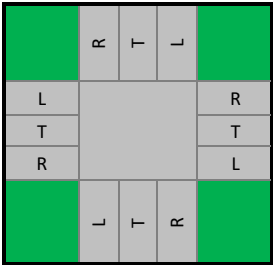
AM Existing plus Trips Phase I

Legend



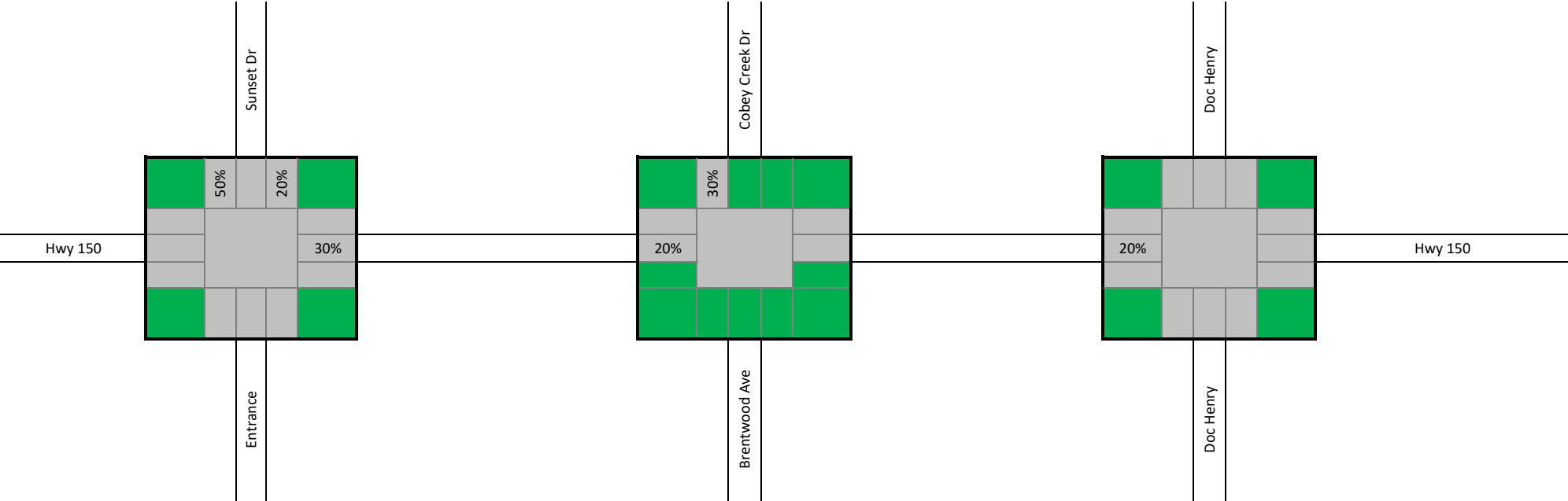
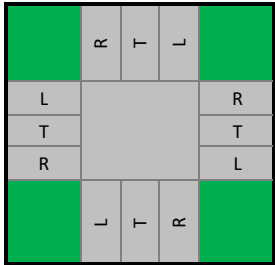
AM Distribution In Phase 2

Legend



AM Distribution Out Phase 2

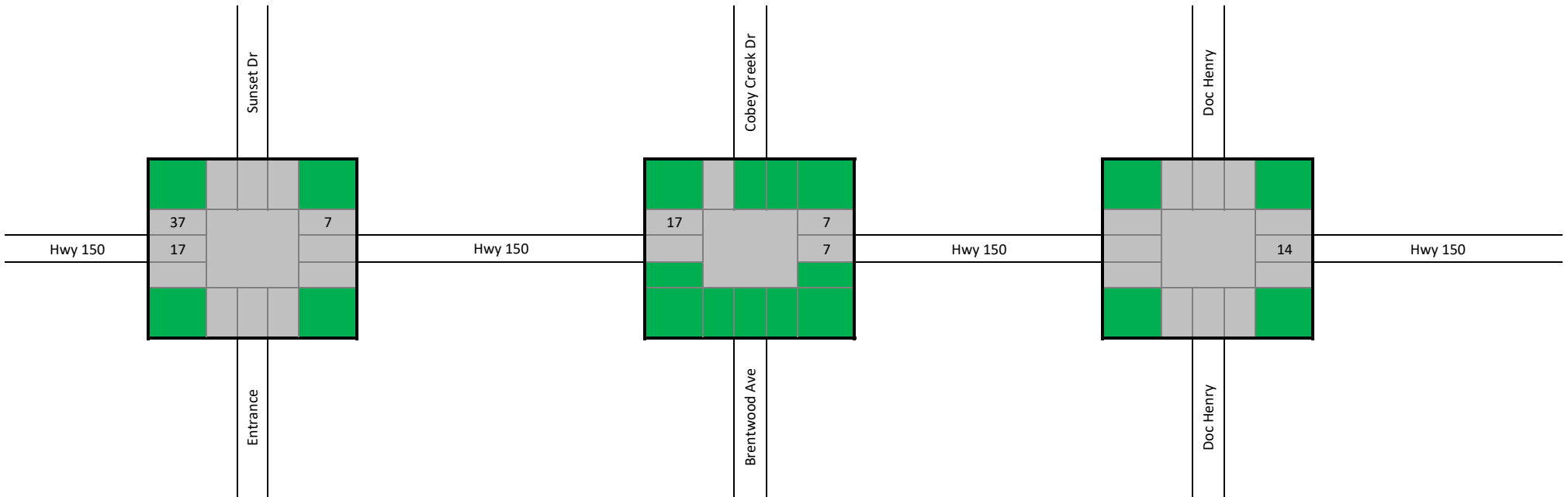
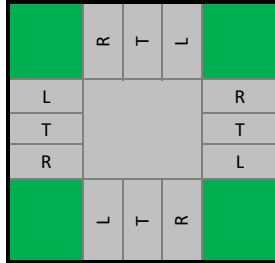
Legend



AM Trips In Phase 2

Trips
68

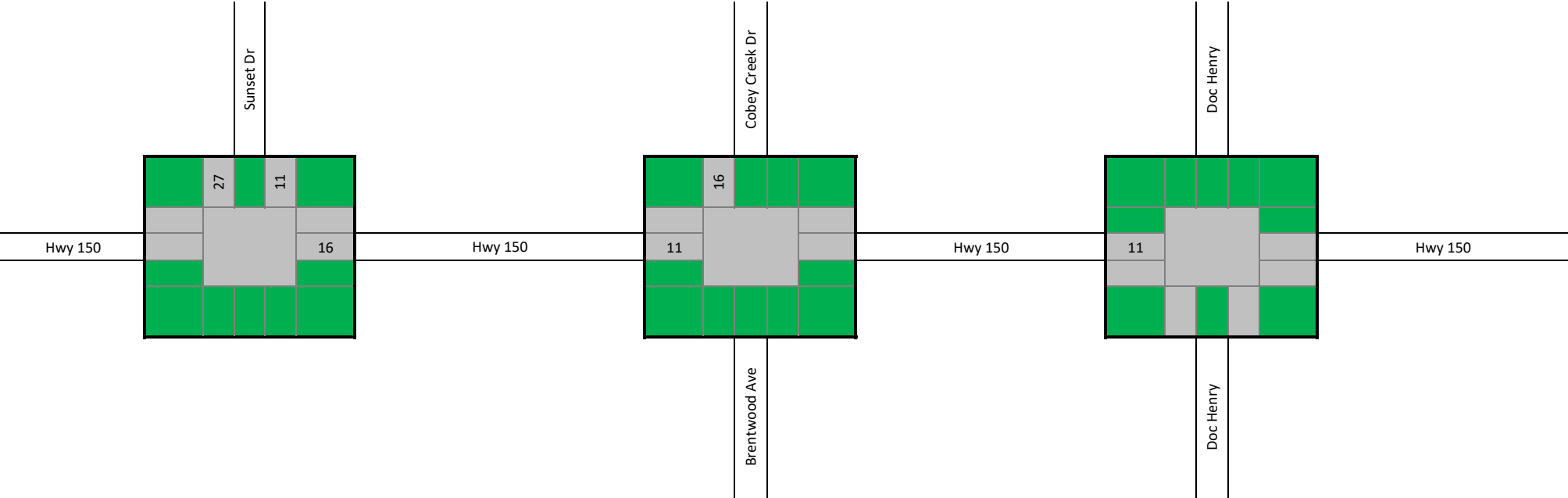
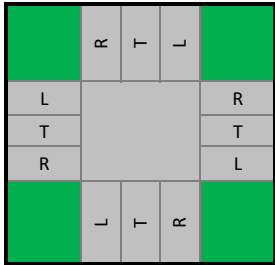
Legend



AM Trips Out
Phase 2

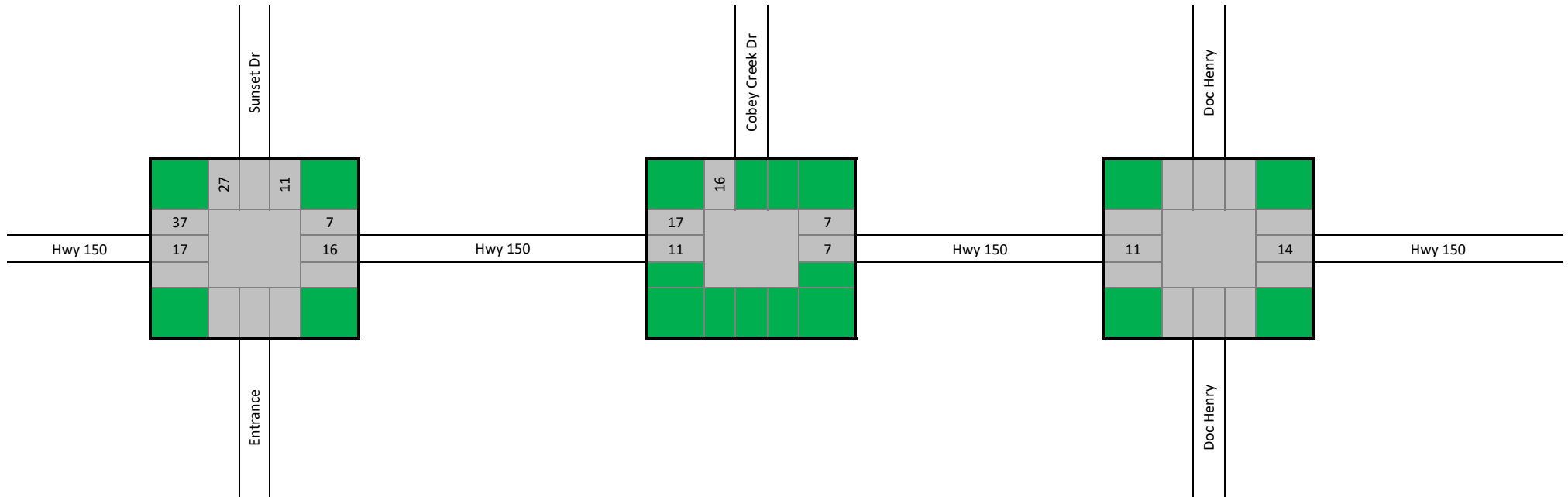
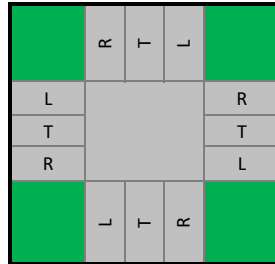
Trips
54

Legend



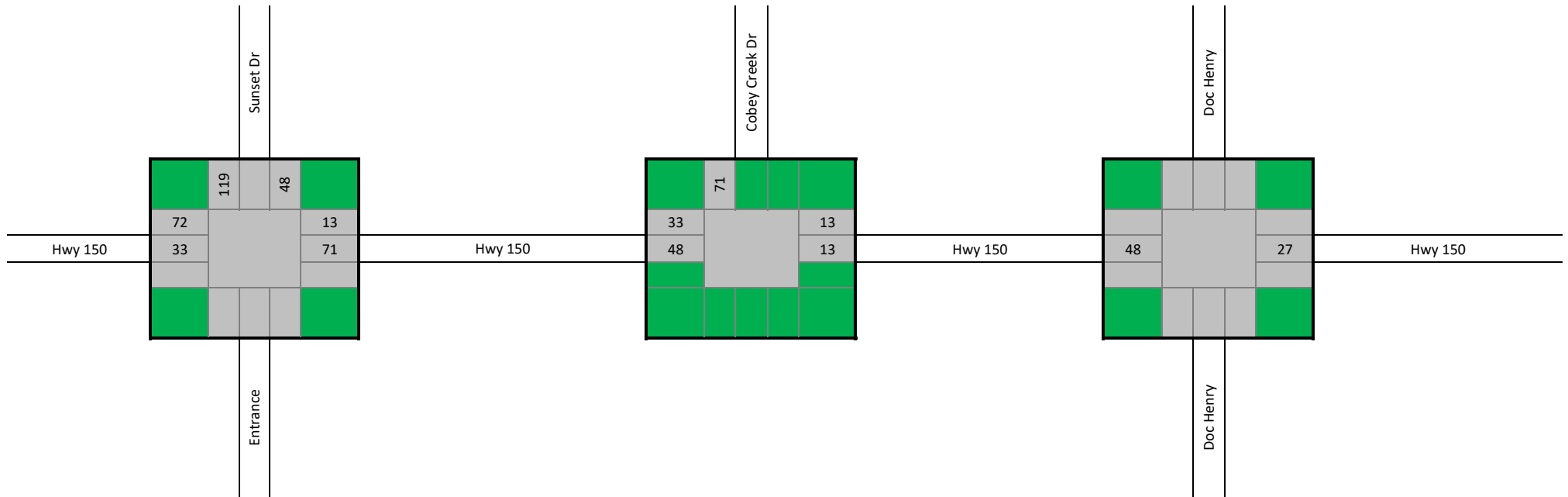
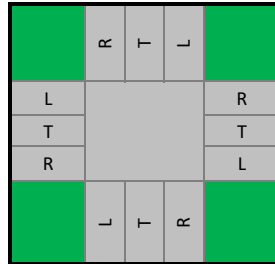
AM Trips Phase 2

Legend



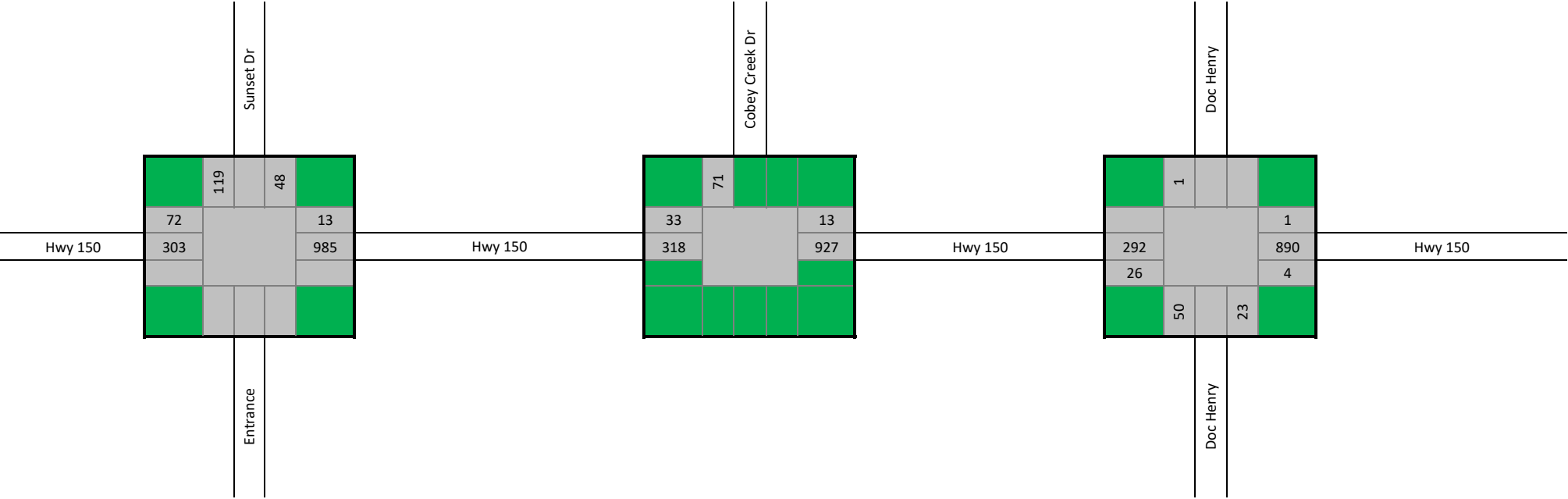
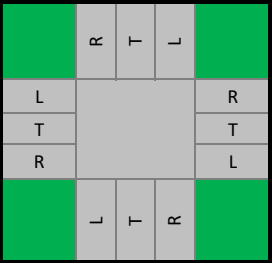
AM Trips Phase 1 & 2

Legend



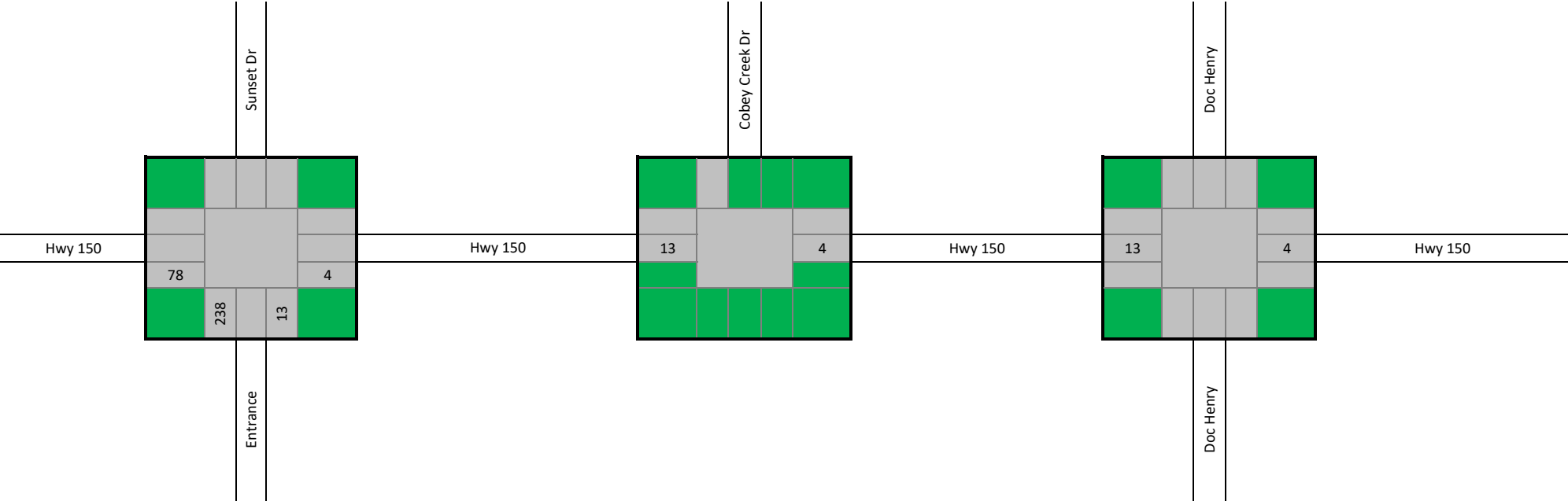
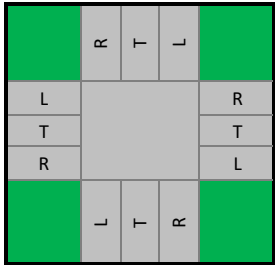
AM Existing plus Trips Phase I and 2

Legend



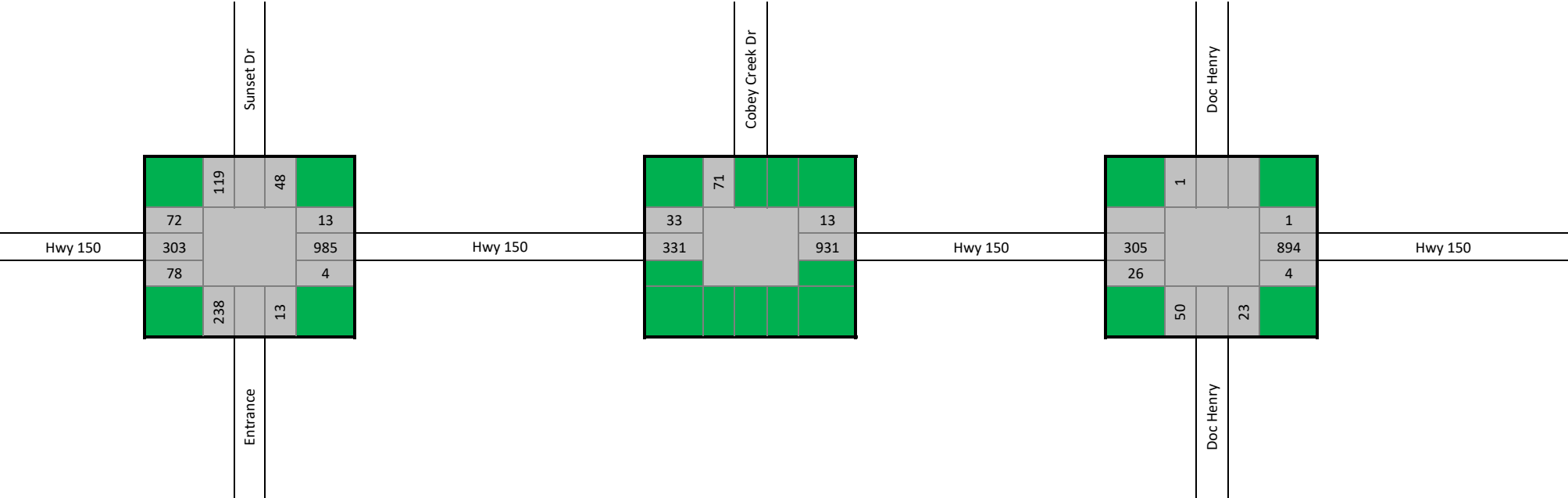
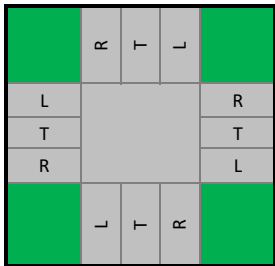
AM Peak Hour Traffic from Ovation TIS

Legend



AM Existing Phase I and Phase II plus Ovation Trips

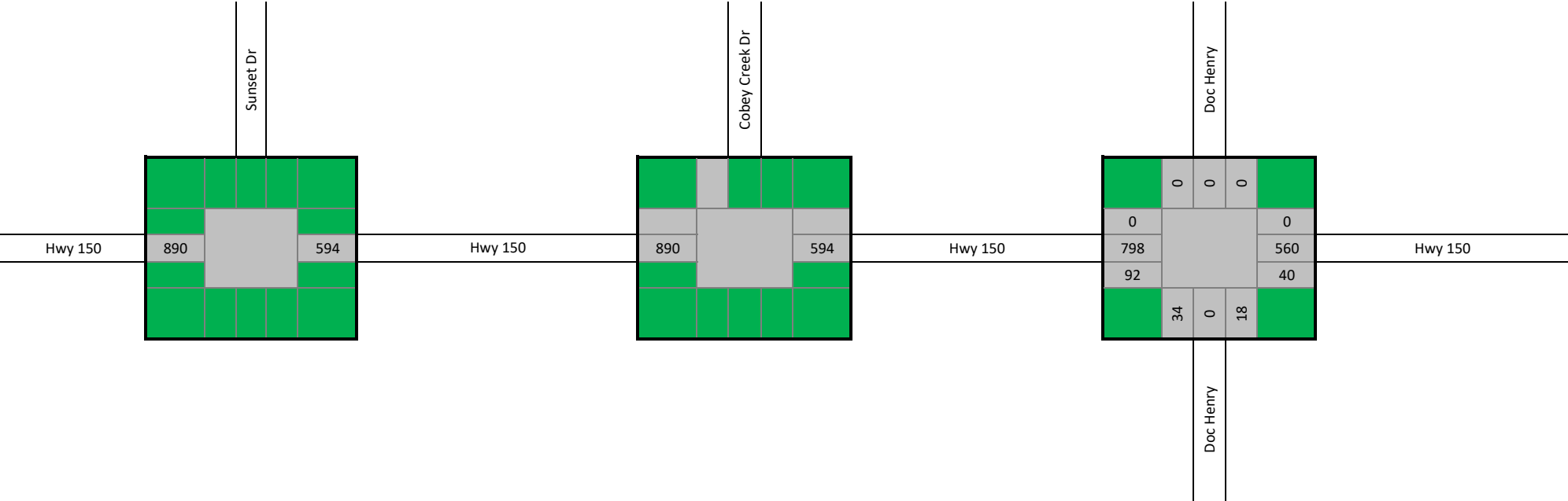
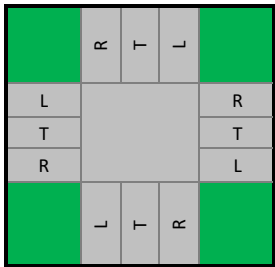
Legend



Existing PM Peak Hour Traffic Counts

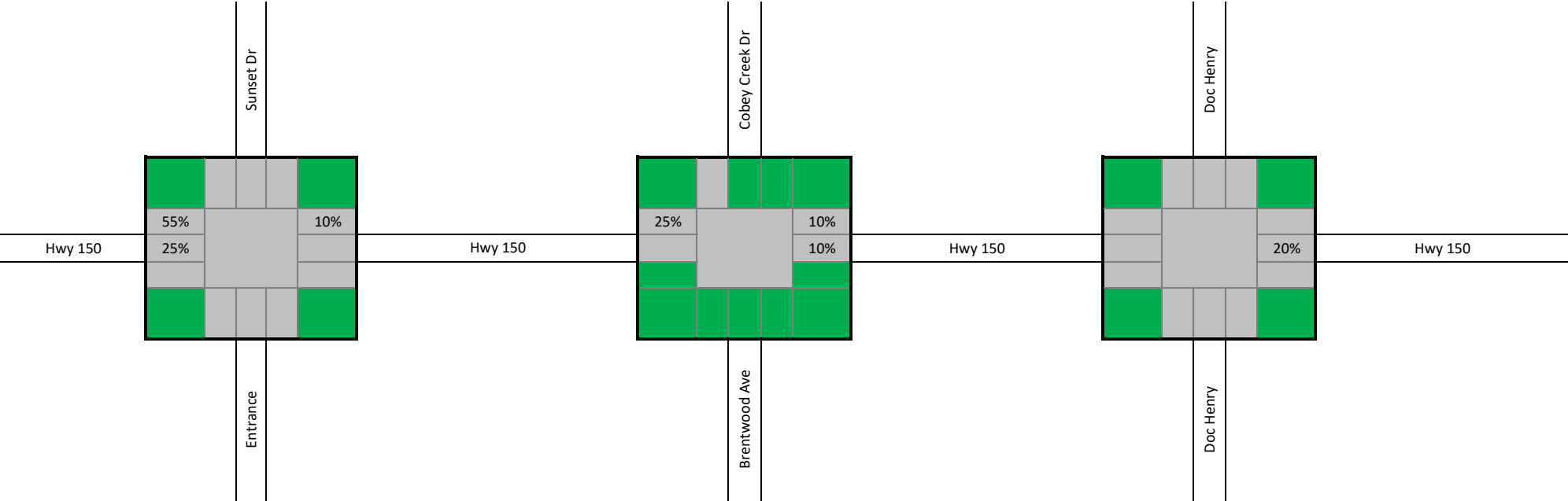
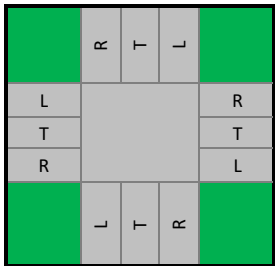
Counts from Jan 2024

Legend



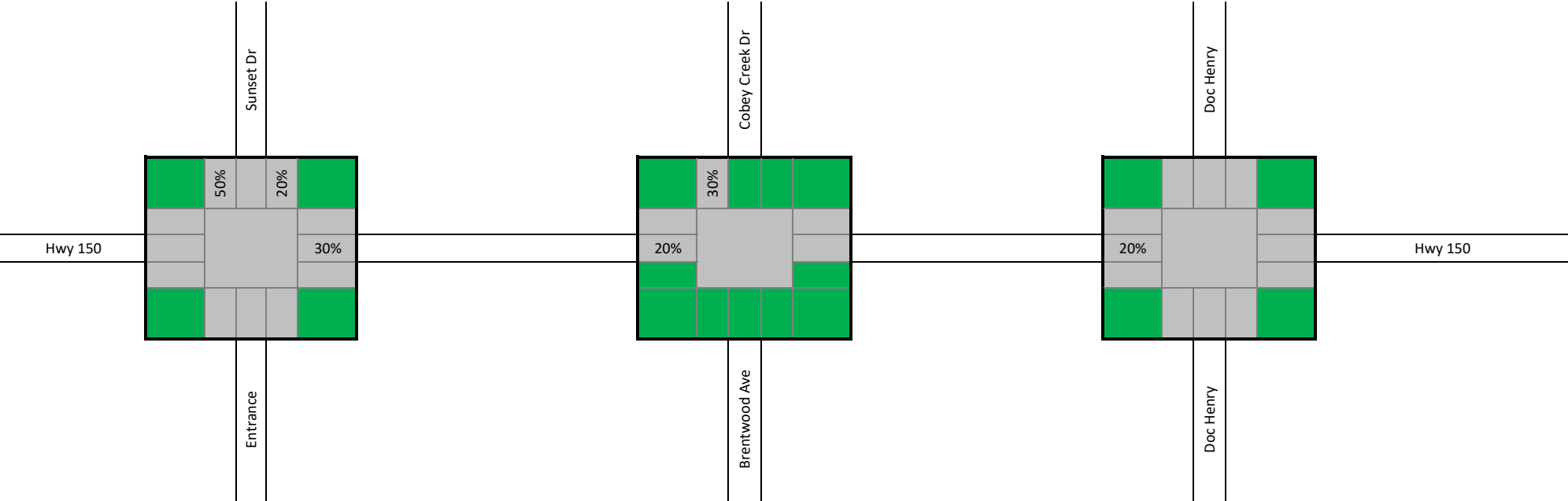
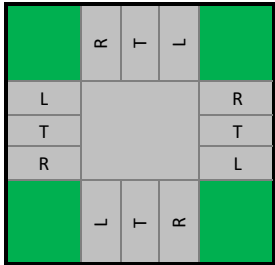
PM Distribution In Phase I

Legend



PM Distribution Out Phase I

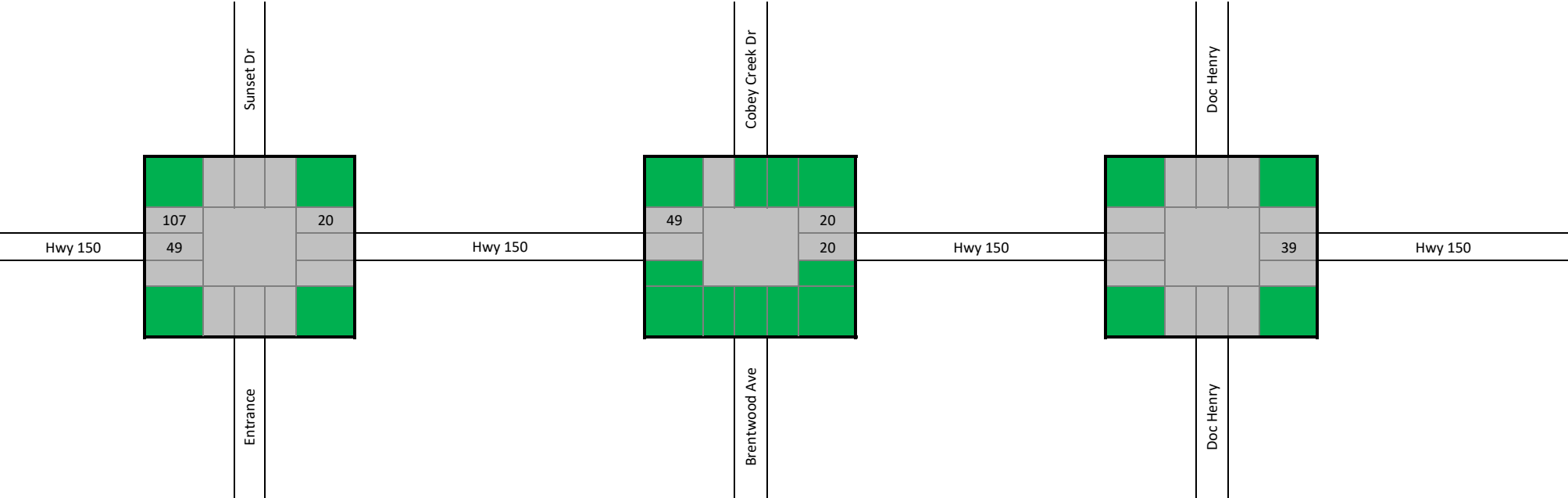
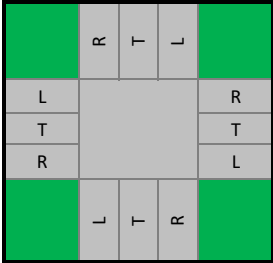
Legend



PM Trips In Phase I

Trips
195

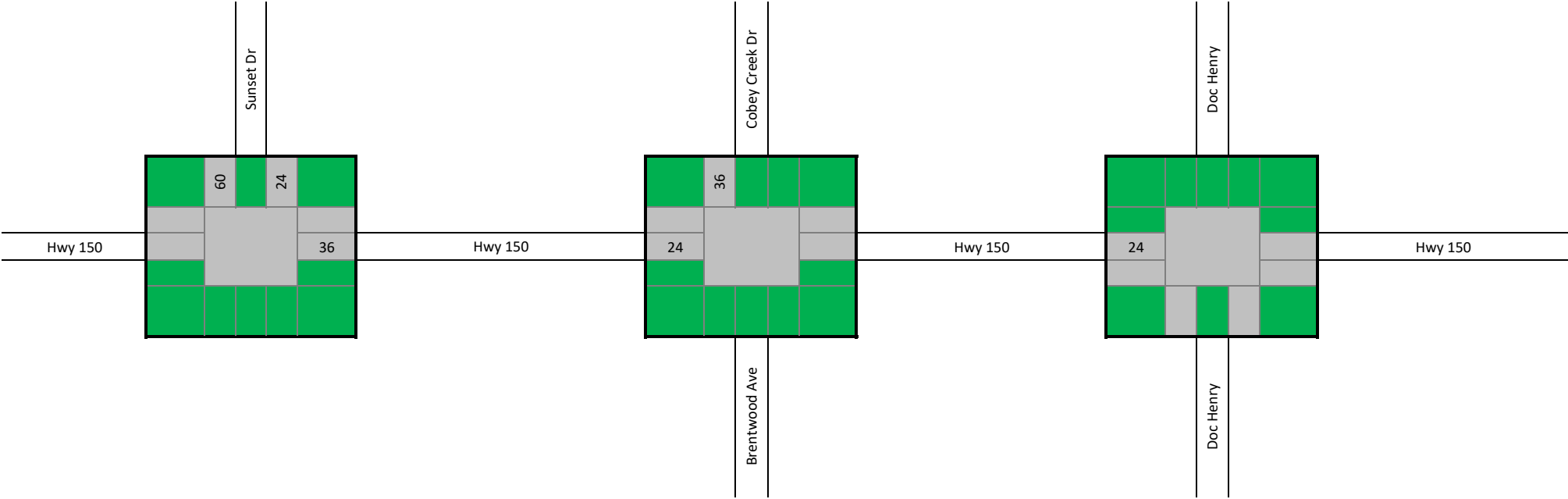
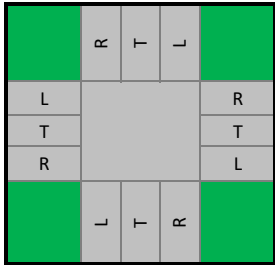
Legend



PM Trips Out
Phase I

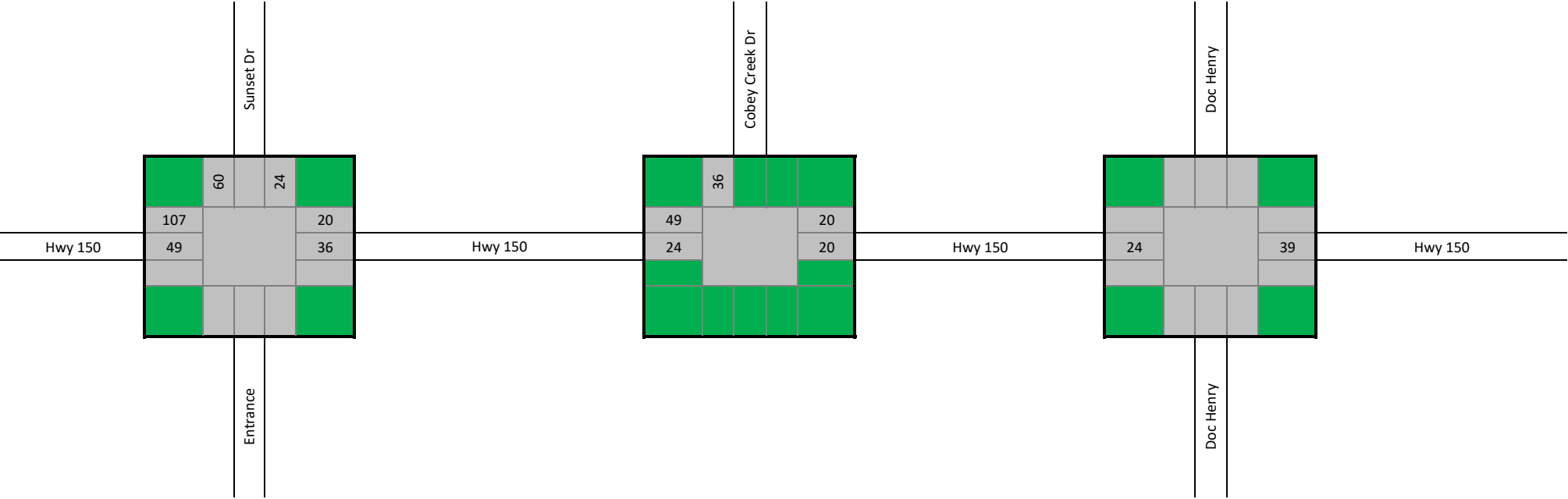
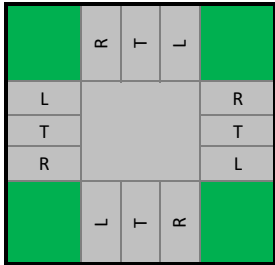
Trips
119

Legend



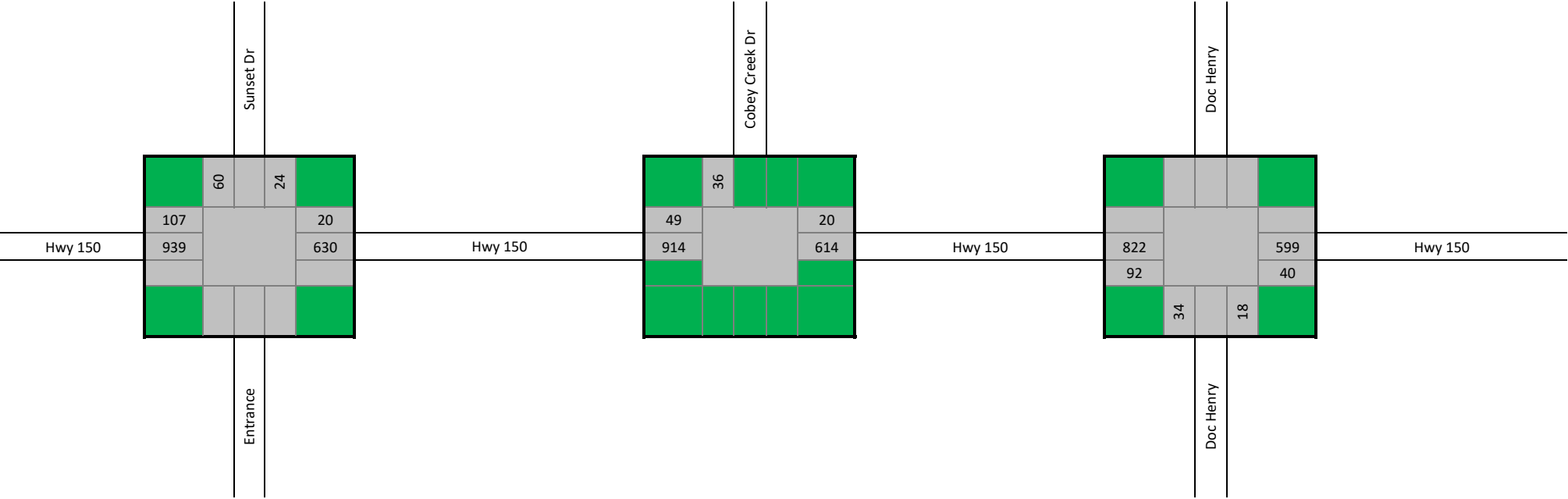
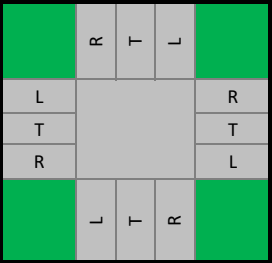
PM Trips Phase I

Legend



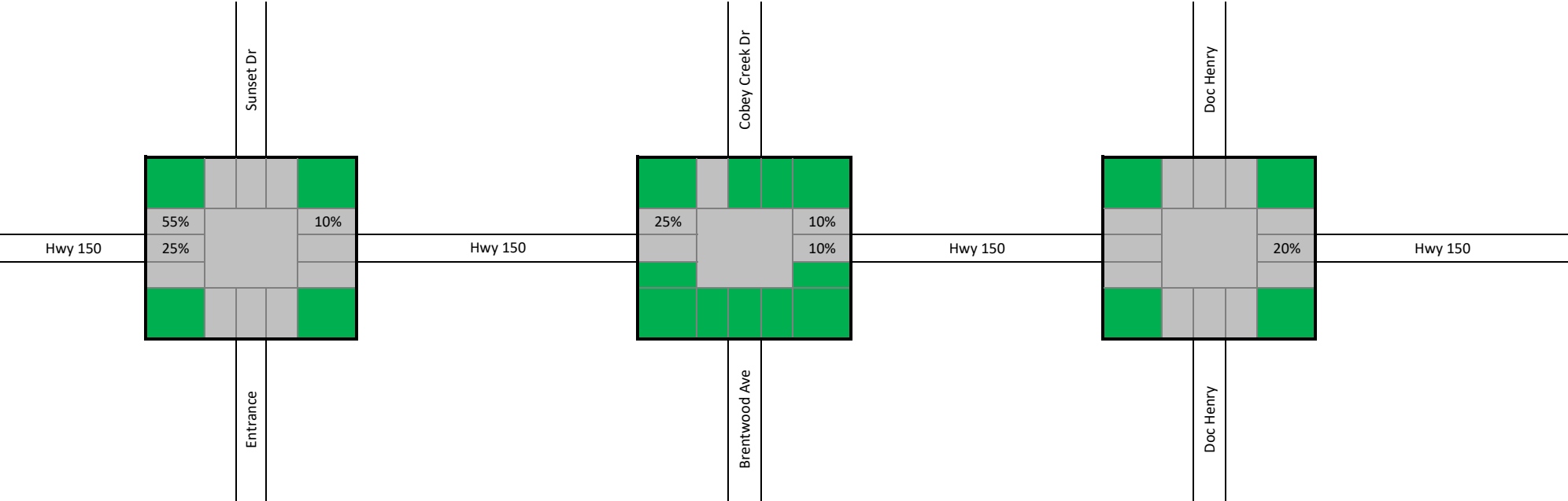
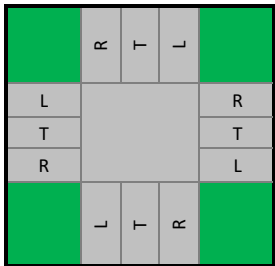
PM Existing plus Trips Phase I

Legend



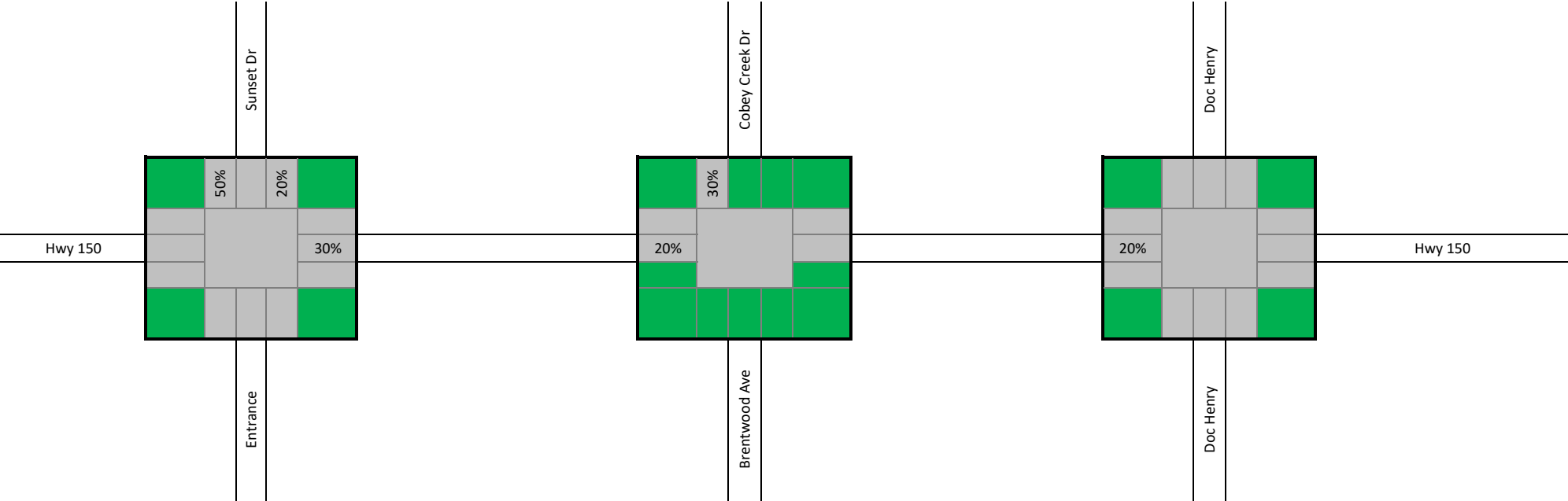
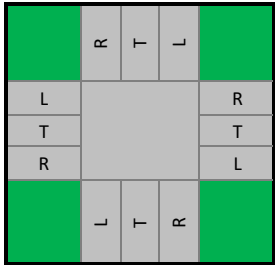
PM Distribution In Phase 2

Legend



PM Distribution Out Phase 2

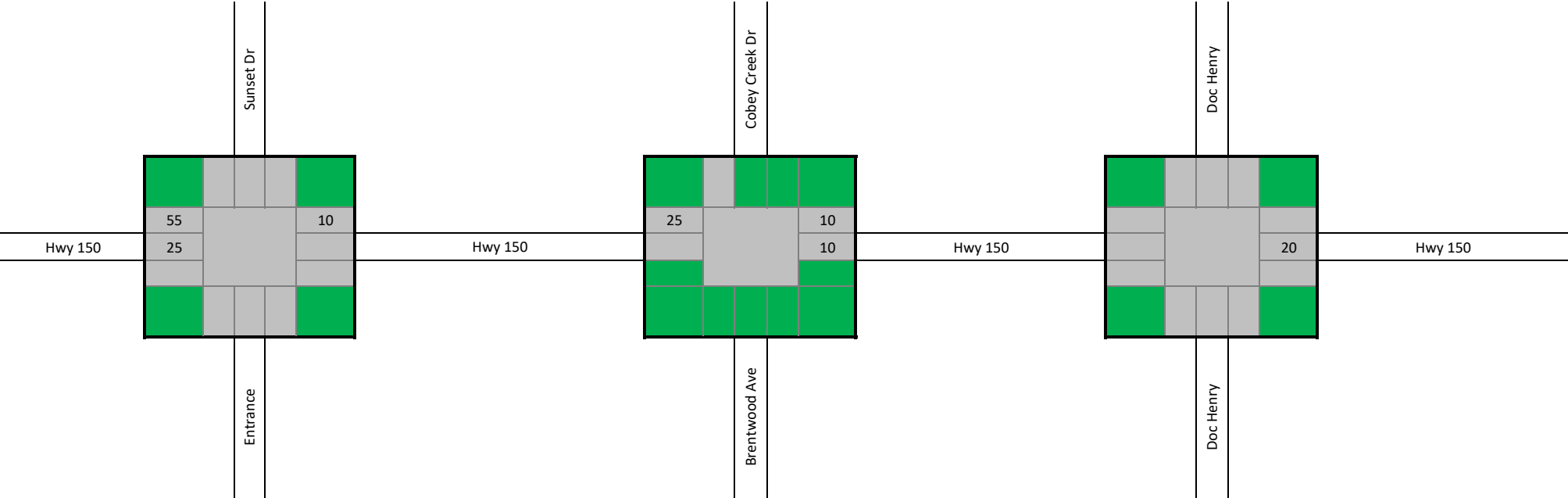
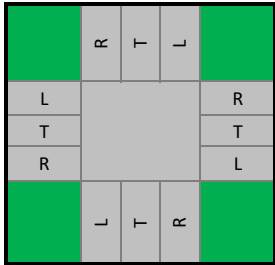
Legend



PM Trips In
Phase 2

Trips
100

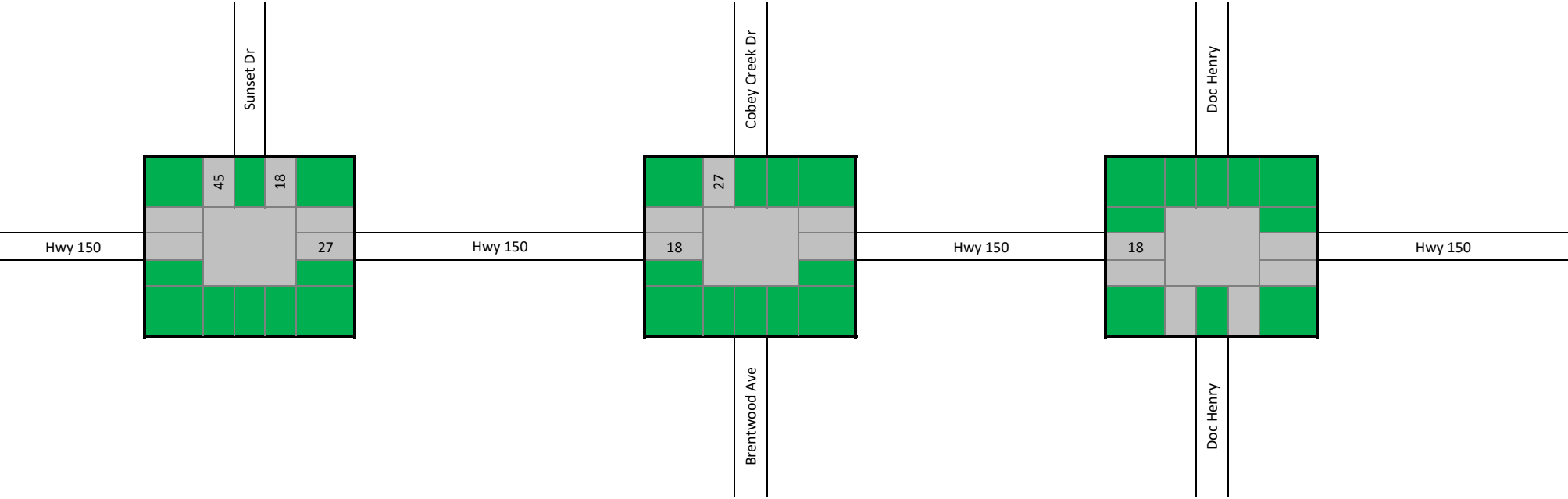
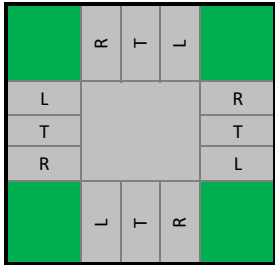
Legend



PM Trips Out
Phase 2

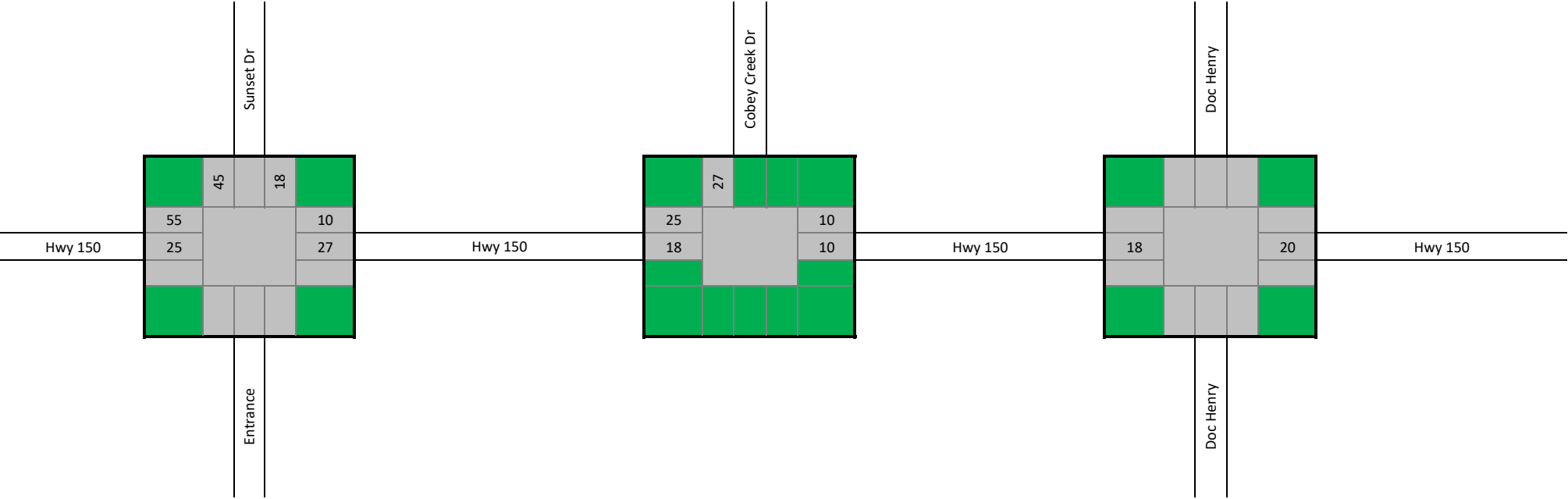
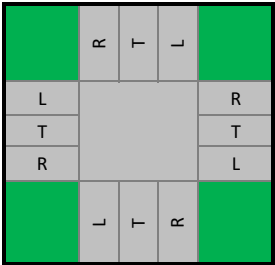
Trips
89

Legend



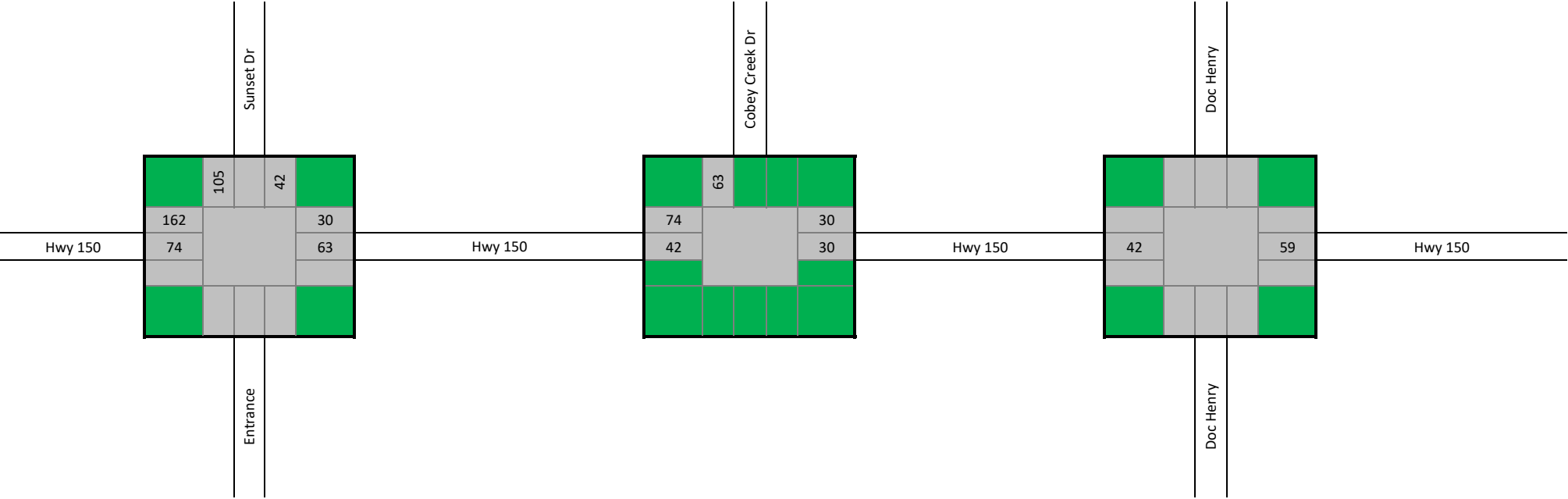
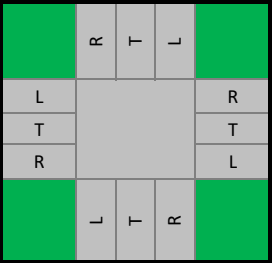
PM Trips Phase 2

Legend



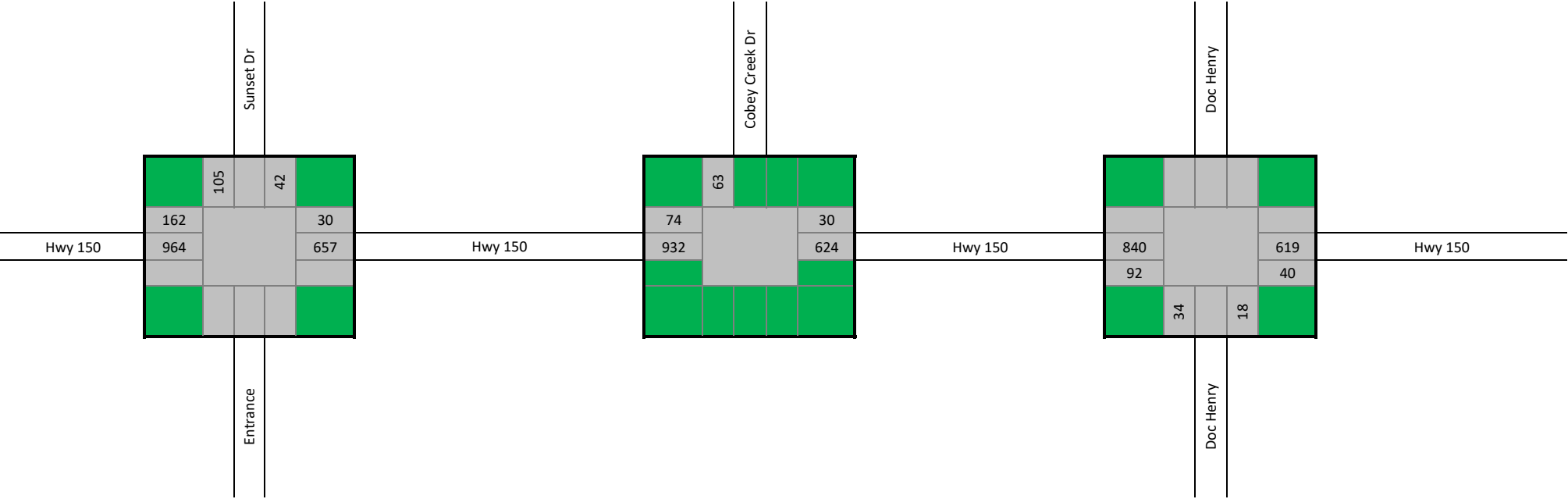
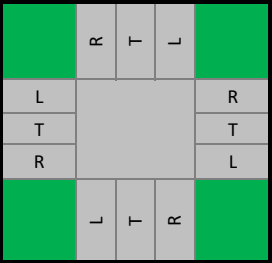
PM Trips Phase 1 & 2

Legend



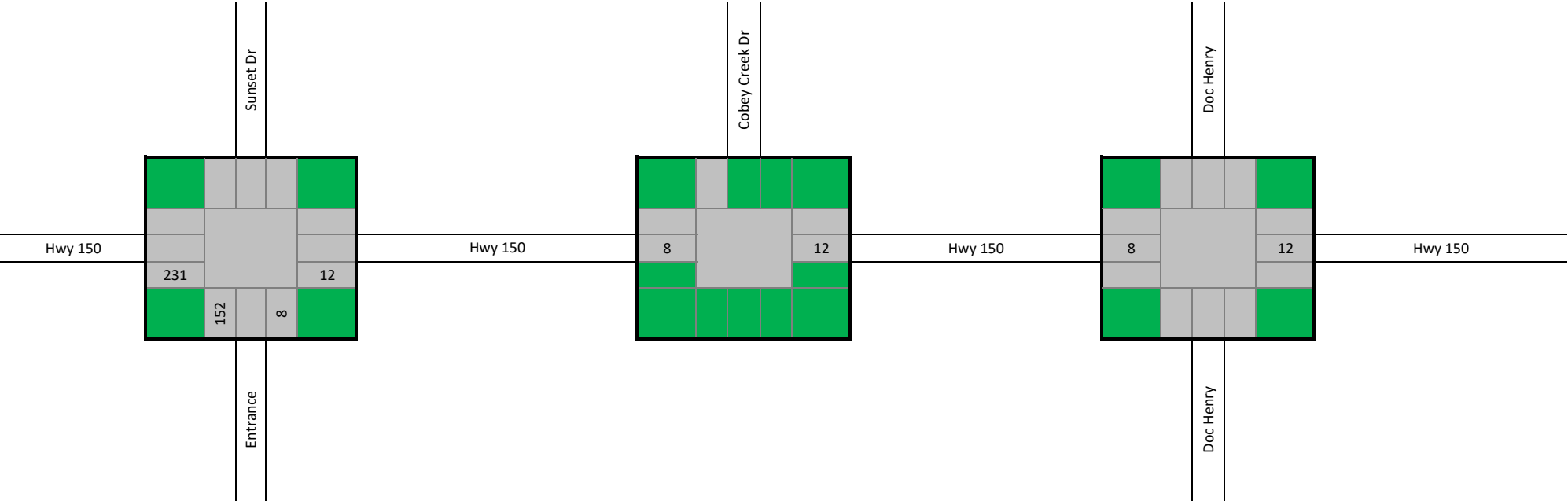
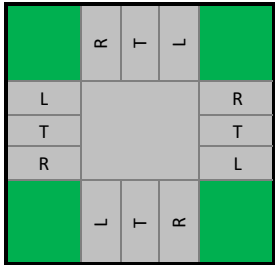
PM Existing plus Trips Phase I and 2

Legend



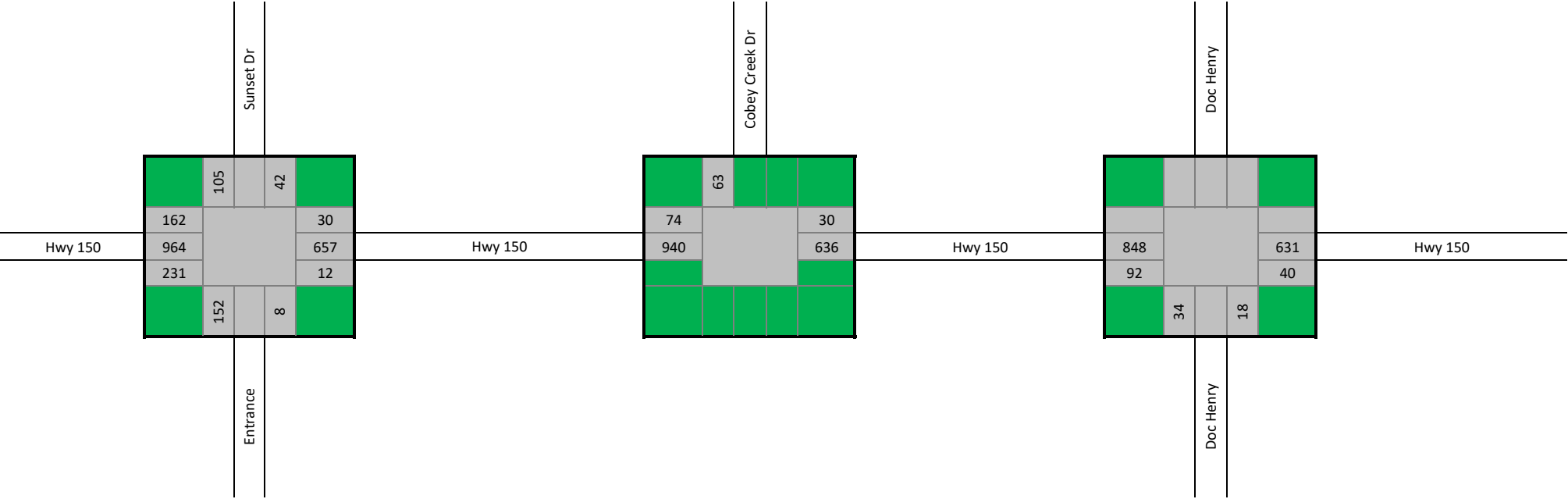
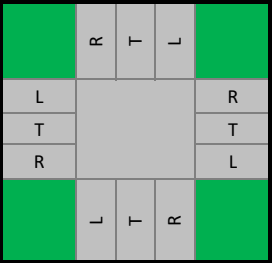
PM Peak Hour Traffic from Ovation TIS

Legend



PM Existing Phase I and Phase II plus Ovation Trips

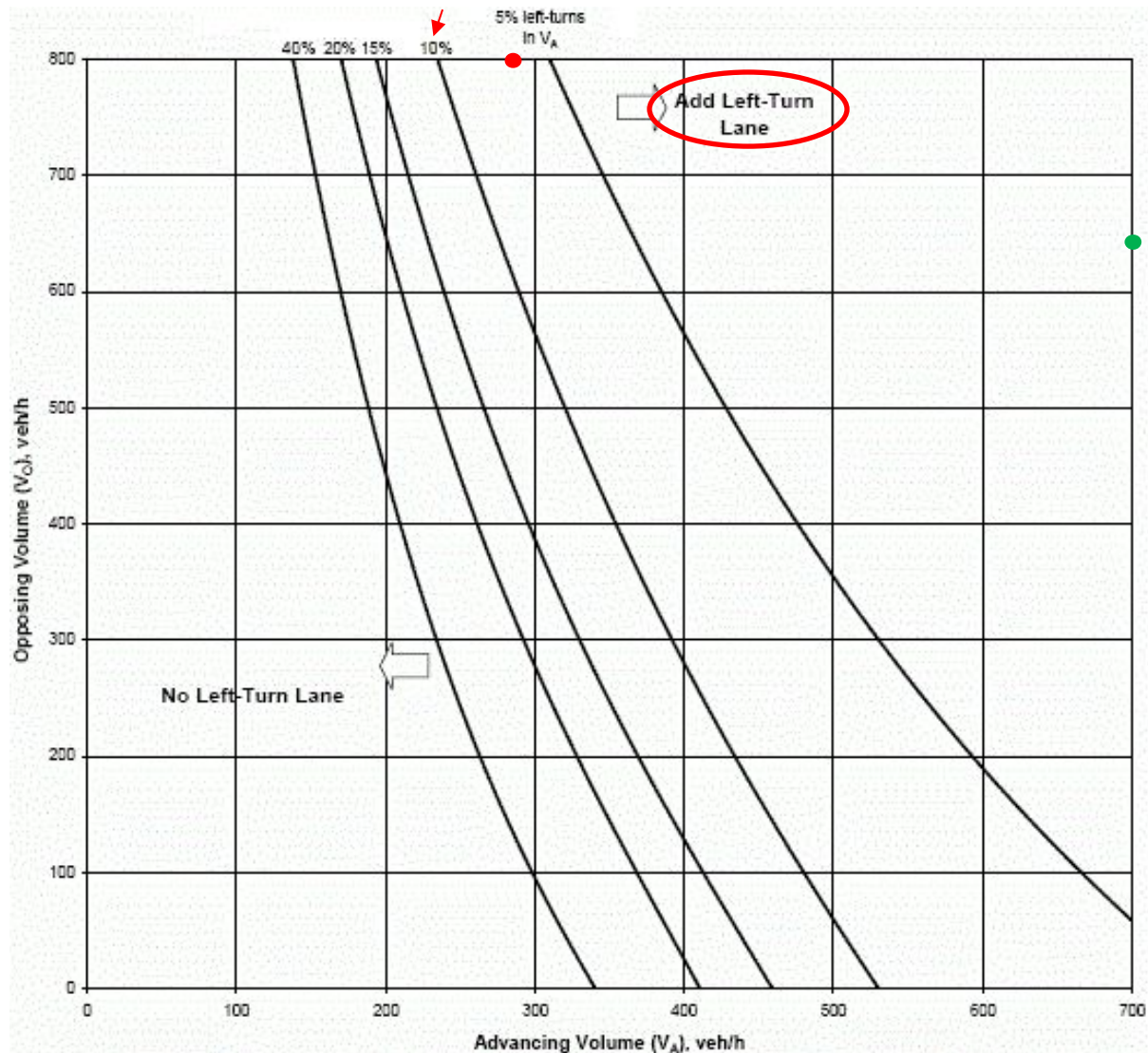
Legend



[illegible]

EXISTING PLUS SITE (PHASE I)

Sunset Road and Highway 150 – **AM** & **PM** – Meets warrants



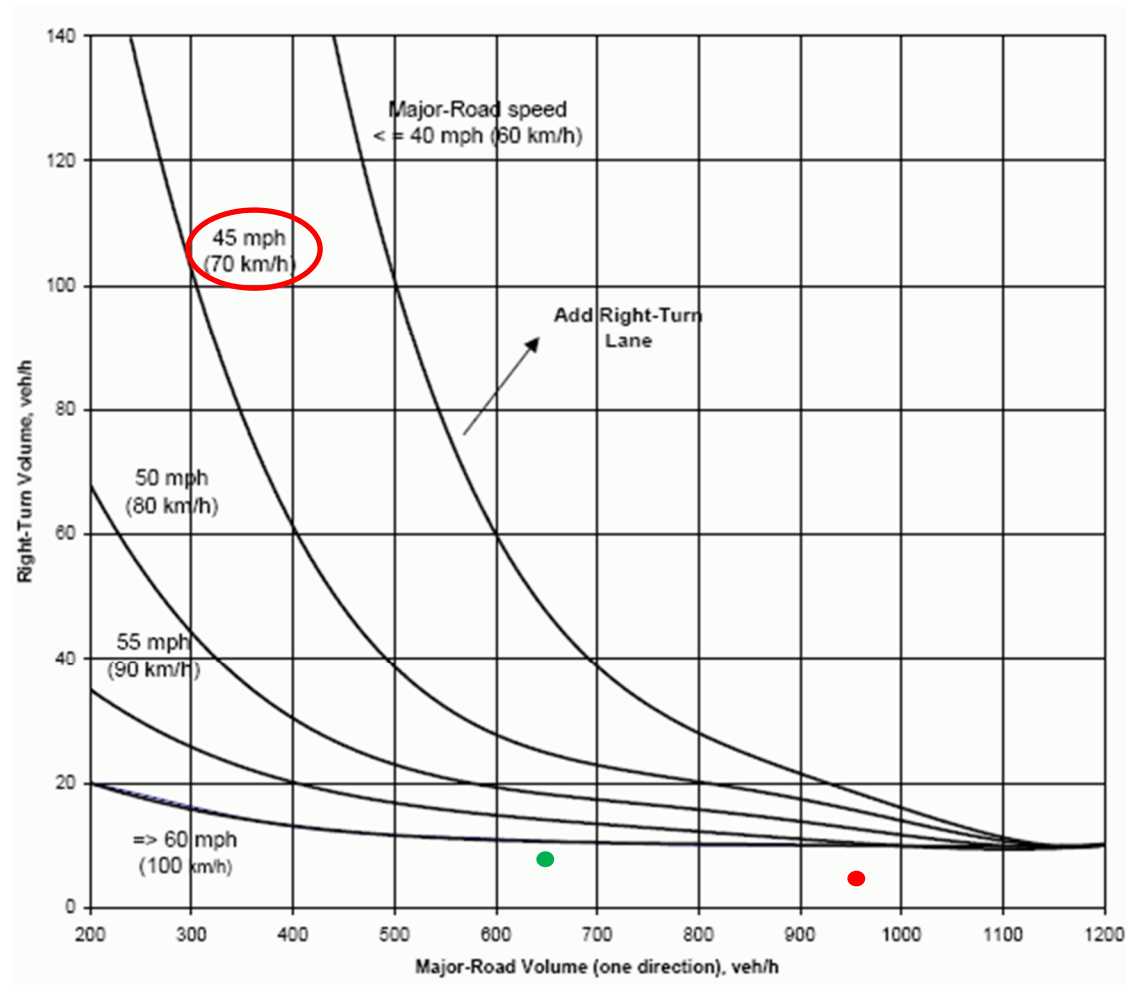
MoDOT Left Turn Lane Guidelines for Two-Lane Roads, 45 mph

1. Opposing Volume (veh/hr) - V_O - The opposing volume is to include only the right-turn and through movements in the opposite direction of the left turning vehicle.
2. Advancing Volume (veh/hr) - V_A - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the left turning vehicle.
3. Operating Speed (mph) - The greatest of anticipated operating speed, measured 85th percentile speed or posted speed.
4. Percentage of left turns in V_A

Left turn lane is not needed for left turn volume less than 10 vph. However, criteria other than volume, such as crash experience, may be used to justify a left turn lane.

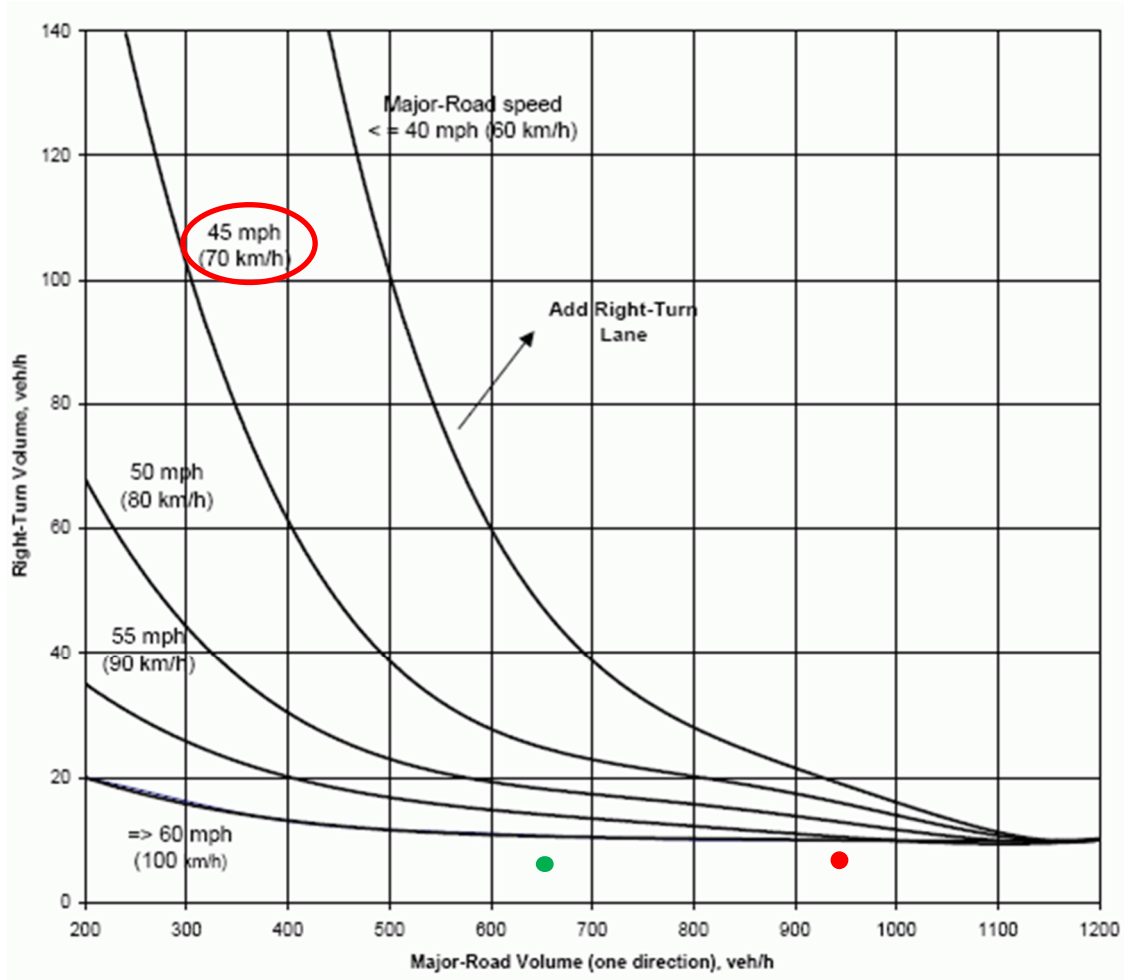
EXISTING PLUS SITE (PHASE I)

Sunset Drive and Highway 150 - **AM** & **PM** - Doesn't meet warrants



1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.
3. Operating Speed (mph) - The greatest of anticipated operating speed, measured 85th percentile speed or posted speed.

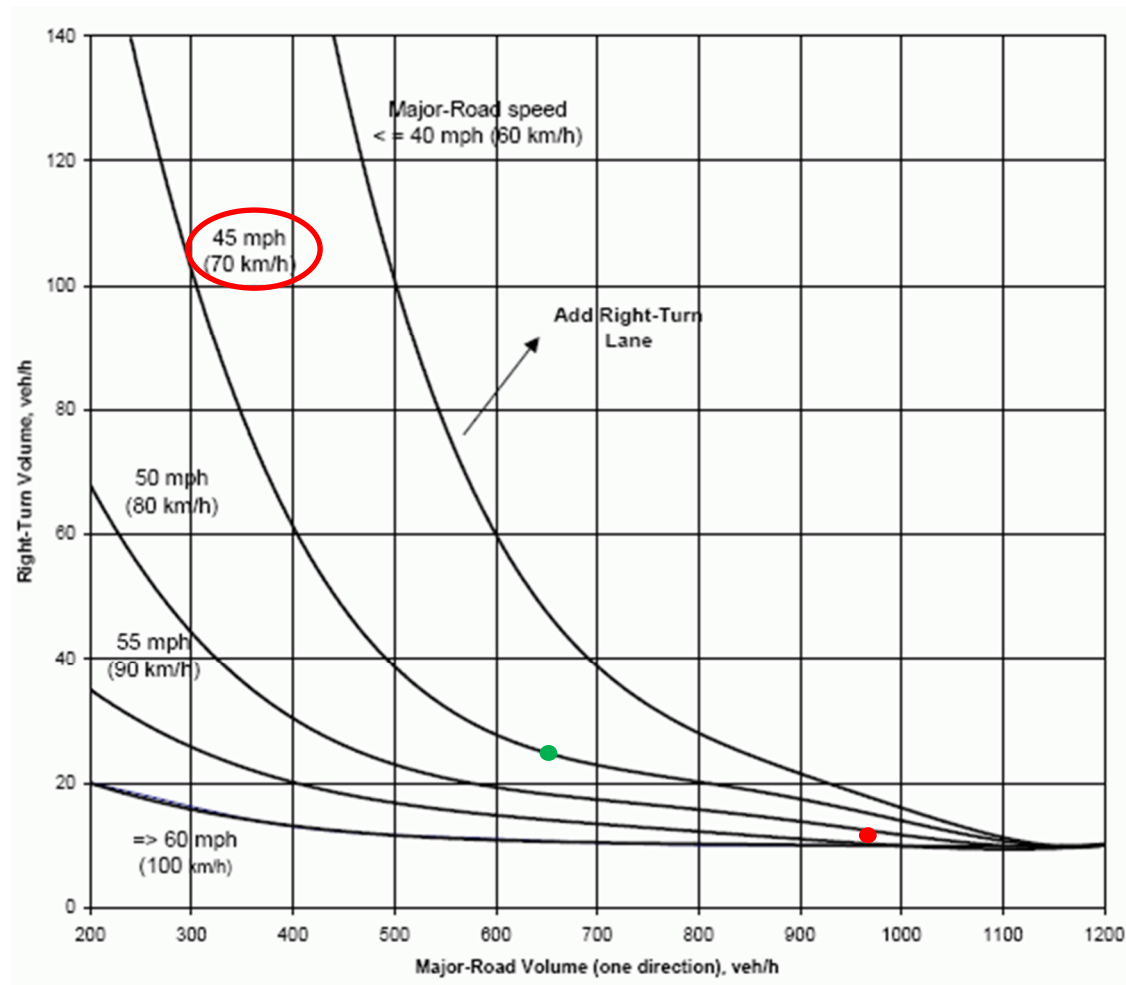
Cobey Creek Dr and Highway 150 – AM & PM – Doesn't meet warrants



1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.
3. Operating Speed (mph) - The greatest of anticipated operating speed, measured 85th percentile speed or posted speed.

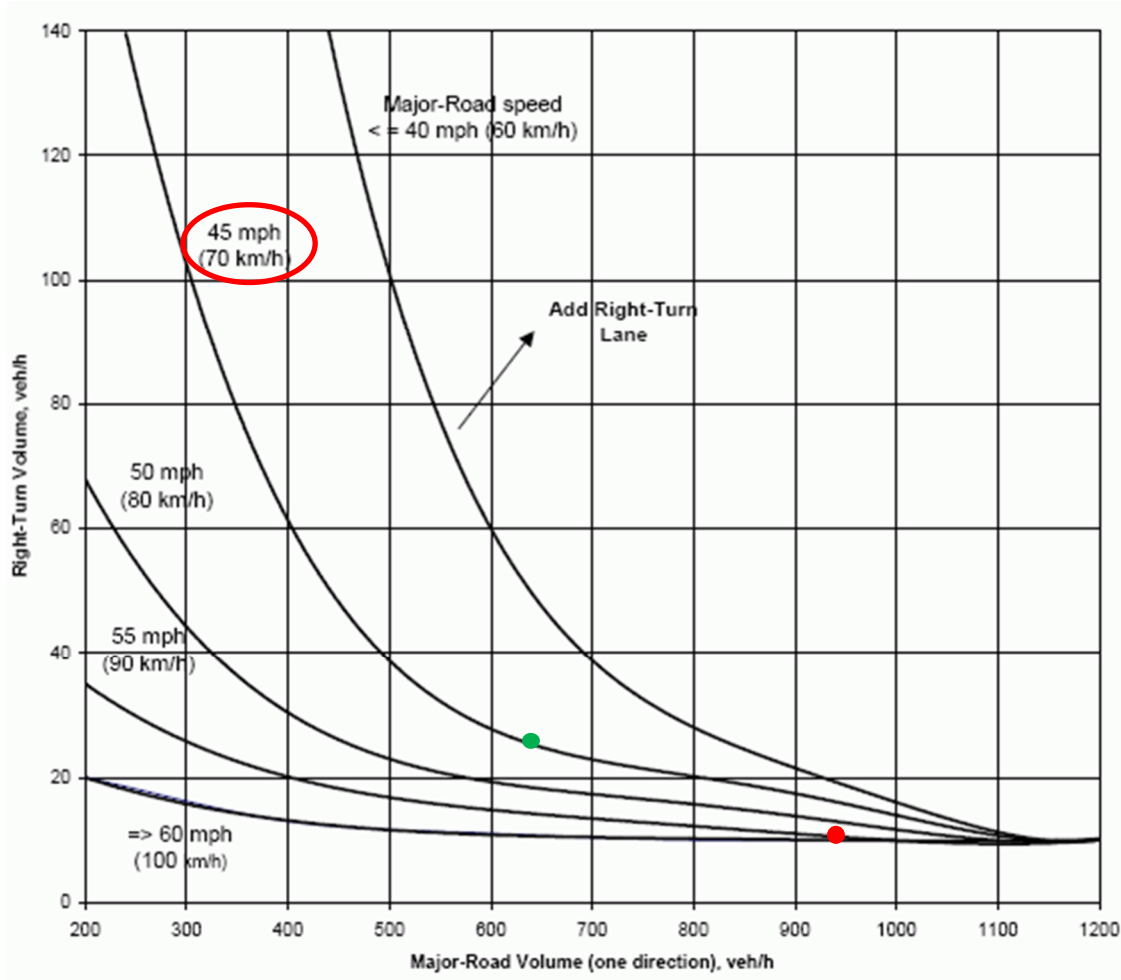
EXISTING PLUS SITE (PHASE I&II)

Sunset Drive and Highway 150 - **AM** & **PM** - Meets warrants



1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.
3. Operating Speed (mph) - The greatest of anticipated operating speed, measured 85th percentile speed or posted speed.

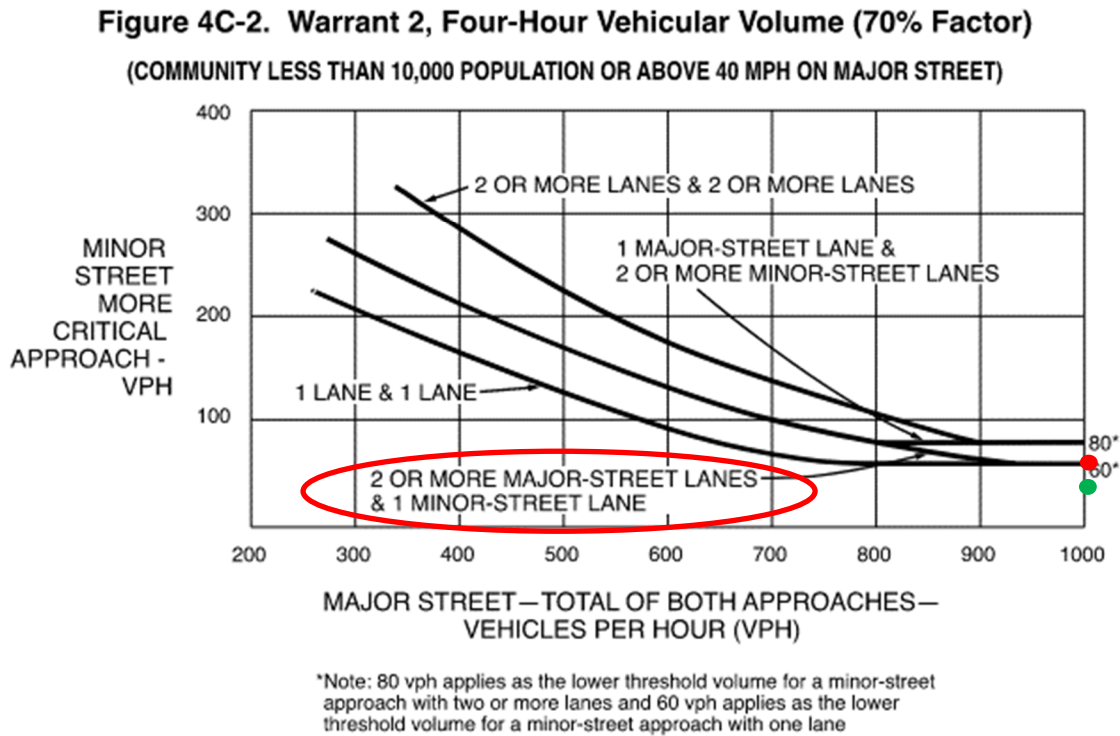
Cobey Creek Dr and Highway 150 – AM & PM – Meets warrants



1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.
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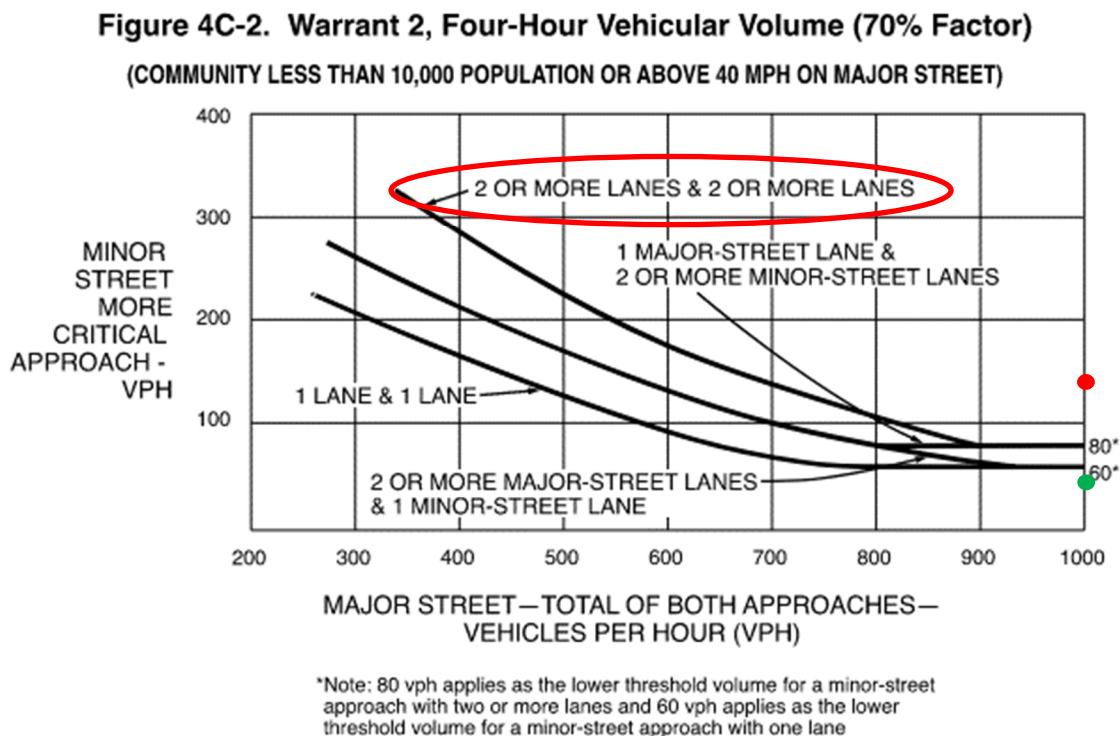
EXISTING

Doc Henry and MO 150 – AM & PM – Meets warrants



EXISTING PLUS SITE (PHASE I)

Sunset Road and MO 150 – AM & PM – Meets warrants



HCM 6th TWSC
3: Doc Henry Rd & Hwy 150

AM Ex

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	244	26	4	863	1	50	0	23	0	0	1
Future Vol, veh/h	0	244	26	4	863	1	50	0	23	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	50	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	68	68	68	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	294	31	4	918	1	74	0	34	0	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	919	0	0	325	0	0	1237	1237	310	1254	1252	919
Stage 1	-	-	-	-	-	-	310	310	-	927	927	-
Stage 2	-	-	-	-	-	-	927	927	-	327	325	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	743	-	-	1235	-	-	153	176	730	149	172	329
Stage 1	-	-	-	-	-	-	700	659	-	322	347	-
Stage 2	-	-	-	-	-	-	322	347	-	686	649	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	743	-	-	1235	-	-	152	175	730	142	171	329
Mov Cap-2 Maneuver	-	-	-	-	-	-	152	175	-	142	171	-
Stage 1	-	-	-	-	-	-	700	659	-	322	346	-
Stage 2	-	-	-	-	-	-	320	346	-	654	649	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			41.1			16		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	203	743	-	-	1235	-	-	-	329			
HCM Lane V/C Ratio	0.529	-	-	-	0.003	-	-	-	0.003			
HCM Control Delay (s)	41.1	0	-	-	7.9	-	-	0	16			
HCM Lane LOS	E	A	-	-	A	-	-	A	C			
HCM 95th %tile Q(veh)	2.7	0	-	-	0	-	-	-	0			

HCM 6th TWSC
3: Doc Henry Rd & Hwy 150

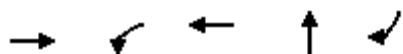
PM Ex

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	798	92	40	560	0	34	0	18	0	0	0
Future Vol, veh/h	0	798	92	40	560	0	34	0	18	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	50	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	91	91	92	72	72	72	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	887	102	44	615	0	47	0	25	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	615	0	0	989	0	0	1641	1641	938	1654	1692	615
Stage 1	-	-	-	-	-	-	938	938	-	703	703	-
Stage 2	-	-	-	-	-	-	703	703	-	951	989	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	965	-	-	699	-	-	80	100	321	78	93	491
Stage 1	-	-	-	-	-	-	317	343	-	428	440	-
Stage 2	-	-	-	-	-	-	428	440	-	312	325	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	965	-	-	699	-	-	76	94	321	68	87	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	94	-	68	87	-
Stage 1	-	-	-	-	-	-	317	343	-	428	412	-
Stage 2	-	-	-	-	-	-	401	412	-	288	325	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.7			97.4			0		
HCM LOS							F			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	103	965	-	-	699	-	-	-	-			
HCM Lane V/C Ratio	0.701	-	-	-	0.063	-	-	-	-			
HCM Control Delay (s)	97.4	0	-	-	10.5	-	-	0	0			
HCM Lane LOS	F	A	-	-	B	-	-	A	A			
HCM 95th %tile Q(veh)	3.6	0	-	-	0.2	-	-	-	-			

Queues

3: Doc Henry Rd & Hwy 150

AM Ex plus Site (Unsignalized CC Rd)



Lane Group	EBT	WBL	WBT	NBT	SBR
Lane Group Flow (vph)	383	4	948	108	1
v/c Ratio	0.37	0.01	0.86	0.26	0.00
Control Delay	10.0	5.5	21.3	9.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	5.5	21.3	9.9	0.0
Queue Length 50th (ft)	79	1	322	4	0
Queue Length 95th (ft)	159	4	494	23	0
Internal Link Dist (ft)	638		802	891	
Turn Bay Length (ft)		50			50
Base Capacity (vph)	1474	581	1491	420	542
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.01	0.64	0.26	0.00
Intersection Summary					

HCM 6th Signalized Intersection Summary

3: Doc Henry Rd & Hwy 150

AM Ex plus Site (Unsignalized CC Rd)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	292	26	4	890	1	50	0	23	0	0	1
Future Volume (veh/h)	0	292	26	4	890	1	50	0	23	0	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	352	31	4	947	1	74	0	34	0	0	1
Peak Hour Factor	0.83	0.83	0.83	0.94	0.94	0.94	0.68	0.68	0.68	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	832	73	468	1085	1	325	16	117	0	471	399
Arrive On Green	0.00	0.49	0.49	0.01	0.58	0.58	0.25	0.00	0.25	0.00	0.00	0.25
Sat Flow, veh/h	1781	1694	149	1781	1868	2	953	62	466	0	1870	1585
Grp Volume(v), veh/h	0	0	383	4	0	948	108	0	0	0	0	1
Grp Sat Flow(s),veh/h/ln	1781	0	1844	1781	0	1870	1481	0	0	0	1870	1585
Q Serve(g_s), s	0.0	0.0	9.5	0.1	0.0	30.8	3.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	9.5	0.1	0.0	30.8	4.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.00	0.69		0.31	0.00		1.00
Lane Grp Cap(c), veh/h	191	0	906	468	0	1086	458	0	0	0	471	399
V/C Ratio(X)	0.00	0.00	0.42	0.01	0.00	0.87	0.24	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	314	0	1521	583	0	1543	458	0	0	0	471	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	11.7	9.7	0.0	12.8	21.5	0.0	0.0	0.0	0.0	20.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.0	0.0	4.2	1.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.2	0.0	0.0	11.7	1.5	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	12.0	9.7	0.0	17.0	22.7	0.0	0.0	0.0	0.0	20.1
LnGrp LOS	A	A	B	A	A	B	C	A	A	A	A	C
Approach Vol, veh/h	383			952			108			1		
Approach Delay, s/veh	12.0			16.9			22.7			20.1		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	24.0		6.4	41.1		24.0		0.0	47.5			
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0		6.0	6.0			
Max Green Setting (Gmax), s	18.0		5.0	59.0		18.0		5.0	59.0			
Max Q Clear Time (g_c+I1), s	6.1		2.1	11.5		2.0		0.0	32.8			
Green Ext Time (p_c), s	0.4		0.0	2.3		0.0		0.0	8.7			
Intersection Summary												
HCM 6th Ctrl Delay	16.1											
HCM 6th LOS	B											

HCM 6th TWSC
4: Hwy 150 & Cobey Creek Dr

AM Ex plus Site (Unsignalized CC Rd)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	318	927	13	0	71
Future Vol, veh/h	33	318	927	13	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	150	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	94	94	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	383	986	14	0	77
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1000	0	-	0	-	986
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	692	-	-	-	0	301
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	692	-	-	-	-	301
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		21		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	692	-	-	-	-	301
HCM Lane V/C Ratio	0.057	-	-	-	-	0.256
HCM Control Delay (s)	10.5	-	-	-	-	21
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	-	1

HCM 6th TWSC
7: Hwy 150 & Sunset Drive

AM Ex plus Site (Unsignalized CC Rd)

Intersection

Int Delay, s/veh 5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	72	303	985	13	48	119
Future Vol, veh/h	72	303	985	13	48	119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	180	-	-	190	0	500
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	94	94	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	365	1048	14	52	129

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1062	0	0 1587 1048
Stage 1	-	-	- - 1048 -
Stage 2	-	-	- - 539 -
Critical Hdwy	4.12	-	- - 6.42 6.22
Critical Hdwy Stg 1	-	-	- - 5.42 -
Critical Hdwy Stg 2	-	-	- - 5.42 -
Follow-up Hdwy	2.218	-	- - 3.518 3.318
Pot Cap-1 Maneuver	656	-	- - 119 277
Stage 1	-	-	- - 338 -
Stage 2	-	-	- - 585 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	656	-	- - 103 277
Mov Cap-2 Maneuver	-	-	- - 103 -
Stage 1	-	-	- - 293 -
Stage 2	-	-	- - 585 -

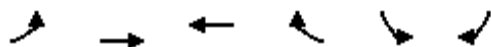
Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	41.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	656	-	-	-	103	277
HCM Lane V/C Ratio	0.132	-	-	-	0.507	0.467
HCM Control Delay (s)	11.3	-	-	-	71.4	28.9
HCM Lane LOS	B	-	-	-	F	D
HCM 95th %tile Q(veh)	0.5	-	-	-	2.3	2.3

Queues

7: Hwy 150 & Sunset Dr

AM Ex plus Site (Signalized CC Rd)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	87	365	1048	14	52	129
v/c Ratio	0.43	0.29	0.98	0.02	0.14	0.29
Control Delay	14.7	6.6	45.4	5.7	30.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	6.6	45.4	5.7	30.1	7.7
Queue Length 50th (ft)	15	73	~582	1	24	0
Queue Length 95th (ft)	34	100	#872	9	55	45
Internal Link Dist (ft)		1377	797		754	
Turn Bay Length (ft)	180			190		500
Base Capacity (vph)	203	1297	1064	907	383	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.28	0.98	0.02	0.14	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

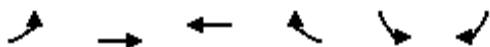
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

7: Hwy 150 & Sunset Dr

AM Ex plus Site (Signalized CC Rd)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	303	985	13	48	119
Future Volume (veh/h)	72	303	985	13	48	119
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	365	1048	14	52	129
Peak Hour Factor	0.83	0.83	0.94	0.94	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	177	1257	1058	896	383	341
Arrive On Green	0.05	0.67	0.57	0.57	0.21	0.21
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	87	365	1048	14	52	129
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	1.7	7.0	48.9	0.3	2.1	6.1
Cycle Q Clear(g_c), s	1.7	7.0	48.9	0.3	2.1	6.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	177	1257	1058	896	383	341
V/C Ratio(X)	0.49	0.29	0.99	0.02	0.14	0.38
Avail Cap(c_a), veh/h	209	1290	1058	896	383	341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	5.9	19.0	8.4	28.1	29.7
Incr Delay (d2), s/veh	2.1	0.1	25.3	0.0	0.7	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	2.1	26.0	0.1	1.0	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.1	6.0	44.3	8.4	28.8	32.8
LnGrp LOS	C	A	D	A	C	C
Approach Vol, veh/h		452	1062		181	
Approach Delay, s/veh		9.3	43.8		31.7	
Approach LOS		A	D		C	
Timer - Assigned Phs			4		6	7
Phs Duration (G+Y+Rc), s			64.4		24.0	9.4
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			61.0		19.0	6.0
Max Q Clear Time (g_c+I1), s			9.0		8.1	3.7
Green Ext Time (p_c), s			2.1		0.4	0.0
Intersection Summary						
HCM 6th Ctrl Delay			33.3			
HCM 6th LOS			C			

Queues

3: Doc Henry Rd & Hwy 150

PM Ex plus Site (Unsignalized CC Rd)

	→	↘	←	↑
Lane Group	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	1035	44	680	72
v/c Ratio	0.90	0.24	0.53	0.20
Control Delay	27.2	7.1	8.4	15.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.2	7.1	8.4	15.0
Queue Length 50th (ft)	555	7	171	4
Queue Length 95th (ft)	799	16	236	29
Internal Link Dist (ft)	638		802	891
Turn Bay Length (ft)		50		
Base Capacity (vph)	1498	189	1581	354
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.23	0.43	0.20
Intersection Summary				

HCM 6th Signalized Intersection Summary

3: Doc Henry Rd & Hwy 150

PM Ex plus Site (Unsignalized CC Rd)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	840	92	40	619	0	34	0	18	0	0	0
Future Volume (veh/h)	0	840	92	40	619	0	34	0	18	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	933	102	44	680	0	47	0	25	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.92	0.72	0.72	0.72	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	480	1018	111	202	1312	0	239	13	101	0	366	310
Arrive On Green	0.00	0.61	0.61	0.04	0.70	0.00	0.20	0.00	0.20	0.00	0.00	0.00
Sat Flow, veh/h	1781	1657	181	1781	1870	0	907	64	517	0	1870	1585
Grp Volume(v), veh/h	0	0	1035	44	680	0	72	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	0	1838	1781	1870	0	1488	0	0	0	1870	1585
Q Serve(g_s), s	0.0	0.0	48.3	0.9	16.6	0.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	48.3	0.9	16.6	0.0	3.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.00	0.65		0.35	0.00		1.00
Lane Grp Cap(c), veh/h	480	0	1129	202	1312	0	352	0	0	0	366	310
V/C Ratio(X)	0.00	0.00	0.92	0.22	0.52	0.00	0.20	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	588	0	1513	248	1540	0	352	0	0	0	366	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	16.5	19.2	6.8	0.0	32.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	7.4	0.5	0.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	18.5	0.5	5.6	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	23.9	19.7	7.1	0.0	34.2	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	C	B	A	A	C	A	A	A	A	A
Approach Vol, veh/h	1035			724			72			0		
Approach Delay, s/veh	23.9			7.9			34.2			0.0		
Approach LOS	C			A			C					
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	24.0		8.5	64.7		24.0	0.0	73.2				
Change Period (Y+Rc), s	5.0		5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s	19.0		6.0	80.0		19.0	6.0	80.0				
Max Q Clear Time (g_c+I1), s	5.8		2.9	50.3		0.0	0.0	18.6				
Green Ext Time (p_c), s	0.2		0.0	9.4		0.0	0.0	5.7				
Intersection Summary												
HCM 6th Ctrl Delay	18.0											
HCM 6th LOS	B											

HCM 6th TWSC
4: Hwy 150 & Cobey Creek Dr

PM Ex plus Site (Unsignalized CC Rd)

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	932	624	30	0	63
Future Vol, veh/h	74	932	624	30	0	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	150	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	91	91	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	1036	686	33	0	68

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	719	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	882	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	882	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	882	-	-	-	447
HCM Lane V/C Ratio	0.093	-	-	-	0.153
HCM Control Delay (s)	9.5	-	-	-	14.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5

HCM 6th TWSC
7: Hwy 150 & Sunset Drive

PM Ex plus Site (Unsignalized CC Rd)

Intersection

Int Delay, s/veh 8.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	162	964	657	30	42	105
Future Vol, veh/h	162	964	657	30	42	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	180	-	-	190	0	500
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	91	91	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	1071	722	33	46	114

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	755	0	0 2153 722
Stage 1	-	-	- 722 -
Stage 2	-	-	- 1431 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	855	-	- 53 427
Stage 1	-	-	- 481 -
Stage 2	-	-	- 220 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	855	-	- ~ 42 427
Mov Cap-2 Maneuver	-	-	- ~ 42 -
Stage 1	-	-	- 380 -
Stage 2	-	-	- 220 -

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	102.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	855	-	-	-	42	427
HCM Lane V/C Ratio	0.211	-	-	-	1.087	0.267
HCM Control Delay (s)	10.3	-	-	-	\$ 316	16.5
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0.8	-	-	-	4.4	1.1

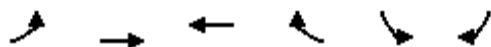
Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Queues

7: Hwy 150 & Sunset Dr

PM Ex plus Site (Signalized CC Rd)

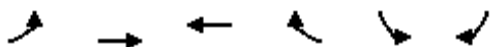


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	180	1071	722	33	46	114
v/c Ratio	0.59	0.91	0.81	0.04	0.11	0.25
Control Delay	14.9	24.0	24.5	3.5	28.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	24.0	24.5	3.5	28.8	8.0
Queue Length 50th (ft)	31	386	279	0	18	0
Queue Length 95th (ft)	57	610	413	12	51	43
Internal Link Dist (ft)		1377	797		754	
Turn Bay Length (ft)	180			190		500
Base Capacity (vph)	307	1502	1213	1042	415	458
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.71	0.60	0.03	0.11	0.25
Intersection Summary						

HCM 6th Signalized Intersection Summary

7: Hwy 150 & Sunset Dr

PM Ex plus Site (Signalized CC Rd)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	162	964	657	30	42	105
Future Volume (veh/h)	162	964	657	30	42	105
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	180	1071	722	33	46	114
Peak Hour Factor	0.90	0.90	0.91	0.91	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	350	1184	924	783	420	374
Arrive On Green	0.07	0.63	0.49	0.49	0.24	0.24
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	180	1071	722	33	46	114
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	3.7	37.5	24.3	0.8	1.5	4.5
Cycle Q Clear(g_c), s	3.7	37.5	24.3	0.8	1.5	4.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	350	1184	924	783	420	374
V/C Ratio(X)	0.51	0.90	0.78	0.04	0.11	0.31
Avail Cap(c_a), veh/h	382	1519	1225	1038	420	374
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	12.0	15.9	10.0	22.9	24.0
Incr Delay (d2), s/veh	1.2	6.7	2.4	0.0	0.5	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	12.7	9.8	0.3	0.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	18.7	18.4	10.0	23.4	26.1
LnGrp LOS	B	B	B	B	C	C
Approach Vol, veh/h		1251	755		160	
Approach Delay, s/veh		18.1	18.0		25.3	
Approach LOS		B	B		C	
Timer - Assigned Phs			4		6	7
Phs Duration (G+Y+Rc), s			53.3		23.0	10.6
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			62.0		18.0	7.0
Max Q Clear Time (g_c+I1), s			39.5		6.5	5.7
Green Ext Time (p_c), s			8.8		0.3	0.1
Intersection Summary						
HCM 6th Ctrl Delay			18.6			
HCM 6th LOS			B			

Queues

3: Doc Henry Rd & Hwy 150

AM Ex plus Future



Lane Group	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	398	4	952	108
v/c Ratio	0.38	0.01	0.86	0.26
Control Delay	10.2	5.5	21.3	9.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	5.5	21.3	9.9
Queue Length 50th (ft)	83	1	325	4
Queue Length 95th (ft)	166	4	500	23
Internal Link Dist (ft)	638		802	891
Turn Bay Length (ft)		50		
Base Capacity (vph)	1468	570	1485	418
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.01	0.64	0.26
Intersection Summary				

HCM 6th Signalized Intersection Summary

3: Doc Henry Rd & Hwy 150

AM Ex plus Future

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	305	26	4	894	1	50	0	23	0	0	0
Future Volume (veh/h)	0	305	26	4	894	1	50	0	23	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	367	31	4	951	1	74	0	34	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.94	0.94	0.94	0.68	0.68	0.68	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	839	71	459	1088	1	323	16	117	0	469	397
Arrive On Green	0.00	0.49	0.49	0.01	0.58	0.58	0.25	0.00	0.25	0.00	0.00	0.00
Sat Flow, veh/h	1781	1701	144	1781	1868	2	953	62	466	0	1870	1585
Grp Volume(v), veh/h	0	0	398	4	0	952	108	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	0	1844	1781	0	1870	1482	0	0	0	1870	1585
Q Serve(g_s), s	0.0	0.0	10.0	0.1	0.0	31.1	3.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	10.0	0.1	0.0	31.1	4.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.00	0.69		0.31	0.00		1.00
Lane Grp Cap(c), veh/h	191	0	910	459	0	1089	456	0	0	0	469	397
V/C Ratio(X)	0.00	0.00	0.44	0.01	0.00	0.87	0.24	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	312	0	1515	573	0	1536	456	0	0	0	469	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	11.8	9.7	0.0	12.8	21.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.0	0.0	4.3	1.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.4	0.0	0.0	11.9	1.6	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	12.1	9.8	0.0	17.1	22.9	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	B	A	A	B	C	A	A	A	A	A
Approach Vol, veh/h	398			956			108			0		
Approach Delay, s/veh	12.1			17.0			22.9			0.0		
Approach LOS	B			B			C					
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	24.0		6.4	41.4		24.0	0.0	47.8				
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s	18.0		5.0	59.0		18.0	5.0	59.0				
Max Q Clear Time (g_c+I1), s	6.1		2.1	12.0		0.0	0.0	33.1				
Green Ext Time (p_c), s	0.4		0.0	2.4		0.0	0.0	8.7				
Intersection Summary												
HCM 6th Ctrl Delay	16.1											
HCM 6th LOS	B											

HCM 6th TWSC
4: Hwy 150 & Cobey Creek Dr

AM Ex plus Future

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	331	931	13	0	71
Future Vol, veh/h	33	331	931	13	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	150	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	94	94	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	399	990	14	0	77
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1004	0	-	0	-	990
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	690	-	-	-	0	299
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	690	-	-	-	-	299
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		21.2		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	690	-	-	-	-	299
HCM Lane V/C Ratio	0.058	-	-	-	-	0.258
HCM Control Delay (s)	10.5	-	-	-	-	21.2
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	-	1

Queues

7: Sunset Dr & Hwy 150

AM Ex plus Future

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	87	365	85	4	1048	14	259	15	52	1	129
v/c Ratio	0.45	0.30	0.08	0.01	0.95	0.01	0.82	0.04	0.17	0.00	0.29
Control Delay	16.6	7.7	1.9	4.5	37.2	0.0	60.5	16.3	34.6	32.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	7.7	1.9	4.5	37.2	0.0	60.5	16.3	34.6	32.0	8.1
Queue Length 50th (ft)	15	74	0	1	575	0	162	1	28	1	0
Queue Length 95th (ft)	41	142	18	4	#903	0	#309	18	62	5	48
Internal Link Dist (ft)	1377			797			998			754	
Turn Bay Length (ft)	180		180	180		190	300		100		500
Base Capacity (vph)	198	1335	1158	679	1203	1046	314	367	309	414	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.27	0.07	0.01	0.87	0.01	0.82	0.04	0.17	0.00	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

7: Sunset Dr & Hwy 150

AM Ex plus Future

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	303	78	4	985	13	238	1	13	48	1	119
Future Volume (veh/h)	72	303	78	4	985	13	238	1	13	48	1	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	365	85	4	1048	14	259	1	14	52	1	129
Peak Hour Factor	0.83	0.83	0.92	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1188	1007	642	1110	940	382	23	324	369	405	343
Arrive On Green	0.05	0.64	0.64	0.01	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1416	107	1495	1398	1870	1585
Grp Volume(v), veh/h	87	365	85	4	1048	14	259	0	15	52	1	129
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1416	0	1601	1398	1870	1585
Q Serve(g_s), s	1.7	8.4	2.0	0.1	49.1	0.3	16.6	0.0	0.7	2.9	0.0	6.6
Cycle Q Clear(g_c), s	1.7	8.4	2.0	0.1	49.1	0.3	16.6	0.0	0.7	3.6	0.0	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		1.00
Lane Grp Cap(c), veh/h	200	1188	1007	642	1110	940	382	0	347	369	405	343
V/C Ratio(X)	0.43	0.31	0.08	0.01	0.94	0.01	0.68	0.00	0.04	0.14	0.00	0.38
Avail Cap(c_a), veh/h	238	1196	1013	736	1176	997	382	0	347	369	405	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	7.8	6.6	6.5	17.8	7.9	35.6	0.0	29.3	30.7	29.0	31.6
Incr Delay (d2), s/veh	1.5	0.1	0.0	0.0	14.5	0.0	9.3	0.0	0.2	0.8	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.8	0.5	0.0	23.1	0.1	6.6	0.0	0.3	1.0	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	8.0	6.7	6.5	32.3	7.9	44.9	0.0	29.5	31.5	29.1	34.7
LnGrp LOS	C	A	A	A	C	A	D	A	C	C	C	C
Approach Vol, veh/h		537			1066			274			182	
Approach Delay, s/veh		10.2			31.9			44.0			33.8	
Approach LOS		B			C			D			C	
Timer - Assigned Phs		2	3	4	6			7	8			
Phs Duration (G+Y+Rc), s		25.0	5.0	64.6	25.0			9.0	60.6			
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5			4.5	4.5			
Max Green Setting (Gmax), s		20.5	5.5	60.5	20.5			6.5	59.5			
Max Q Clear Time (g_c+I1), s		18.6	2.1	10.4	8.6			3.7	51.1			
Green Ext Time (p_c), s		0.2	0.0	2.4	0.4			0.0	5.1			
Intersection Summary												
HCM 6th Ctrl Delay			28.0									
HCM 6th LOS			C									

Queues

3: Doc Henry Rd & Hwy 150

PM Ex plus Future



Lane Group	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	1044	44	474	72
v/c Ratio	0.90	0.24	0.37	0.21
Control Delay	27.3	7.2	6.5	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.3	7.2	6.5	15.1
Queue Length 50th (ft)	566	7	102	5
Queue Length 95th (ft)	816	16	143	29
Internal Link Dist (ft)	638		802	891
Turn Bay Length (ft)		50		
Base Capacity (vph)	1485	187	1574	351
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.24	0.30	0.21
Intersection Summary				

HCM 6th Signalized Intersection Summary

3: Doc Henry Rd & Hwy 150

PM Ex plus Future

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	848	92	40	431	0	34	0	18	0	0	0
Future Volume (veh/h)	0	848	92	40	431	0	34	0	18	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	942	102	44	474	0	47	0	25	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.92	0.72	0.72	0.72	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	631	1025	111	200	1318	0	236	12	100	0	362	307
Arrive On Green	0.00	0.62	0.62	0.04	0.70	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1781	1658	180	1781	1870	0	907	64	517	0	1870	1585
Grp Volume(v), veh/h	0	0	1044	44	474	0	72	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	0	1838	1781	1870	0	1488	0	0	0	1870	1585
Q Serve(g_s), s	0.0	0.0	49.3	0.9	9.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	49.3	0.9	9.8	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.00	0.65		0.35	0.00		1.00
Lane Grp Cap(c), veh/h	631	0	1136	200	1318	0	348	0	0	0	362	307
V/C Ratio(X)	0.00	0.00	0.92	0.22	0.36	0.00	0.21	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	738	0	1497	245	1524	0	348	0	0	0	362	307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	16.6	19.5	5.7	0.0	33.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	7.8	0.6	0.2	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	19.0	0.5	3.3	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	24.3	20.1	5.9	0.0	34.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	C	C	A	A	C	A	A	A	A	A
Approach Vol, veh/h	1044			518			72			0		
Approach Delay, s/veh	24.3			7.1			34.8			0.0		
Approach LOS	C			A			C					
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	24.0		8.5	65.7		24.0		0.0	74.2			
Change Period (Y+Rc), s	5.0		5.0	5.0		5.0		5.0	5.0			
Max Green Setting (Gmax), s	19.0		6.0	80.0		19.0		6.0	80.0			
Max Q Clear Time (g_c+I1), s	5.9		2.9	51.3		0.0		0.0	11.8			
Green Ext Time (p_c), s	0.2		0.0	9.4		0.0		0.0	3.5			
Intersection Summary												
HCM 6th Ctrl Delay	19.3											
HCM 6th LOS	B											

HCM 6th TWSC
4: Hwy 150 & Cobey Creek Dr

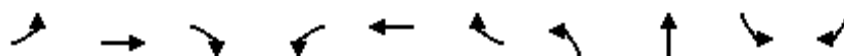
PM Ex plus Future

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	940	636	30	0	63
Future Vol, veh/h	74	940	636	30	0	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	91	91	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	1044	699	33	0	68
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	732	0	-	0	-	716
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	873	-	-	-	0	430
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	873	-	-	-	-	430
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		15		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	873	-	-	-	-	430
HCM Lane V/C Ratio	0.094	-	-	-	-	0.159
HCM Control Delay (s)	9.6	-	-	-	-	15
HCM Lane LOS	A	-	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	-	0.6

Queues

7: Cobey Creek Rd/Sunset Dr & Hwy 150

PM Ex plus Future



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	180	1071	251	13	722	33	165	9	46	114
v/c Ratio	0.50	0.90	0.23	0.07	0.77	0.04	0.54	0.02	0.15	0.20
Control Delay	10.3	24.7	2.6	5.0	22.8	0.1	40.5	0.1	32.9	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	24.7	2.6	5.0	22.8	0.1	40.5	0.1	32.9	0.8
Queue Length 50th (ft)	31	386	11	2	292	0	84	0	21	0
Queue Length 95th (ft)	51	#904	46	7	425	1	#182	0	58	0
Internal Link Dist (ft)		1377			797			998		
Turn Bay Length (ft)	180		180	180		190	300		100	500
Base Capacity (vph)	379	1395	1231	188	1305	1132	306	492	304	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.77	0.20	0.07	0.55	0.03	0.54	0.02	0.15	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

7: Cobey Creek Rd/Sunset Dr & Hwy 150

PM Ex plus Future

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	964	231	12	657	30	152	0	8	42	0	105
Future Volume (veh/h)	162	964	231	12	657	30	152	0	8	42	0	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	180	1071	251	13	722	33	165	0	9	46	0	114
Peak Hour Factor	0.90	0.90	0.92	0.92	0.91	0.91	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	406	1155	979	151	1064	901	336	0	317	355	374	317
Arrive On Green	0.06	0.62	0.62	0.02	0.57	0.57	0.20	0.00	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1279	0	1585	1406	1870	1585
Grp Volume(v), veh/h	180	1071	251	13	722	33	165	0	9	46	0	114
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1279	0	1585	1406	1870	1585
Q Serve(g_s), s	3.7	46.1	6.5	0.2	24.4	0.8	10.7	0.0	0.4	2.4	0.0	5.6
Cycle Q Clear(g_c), s	3.7	46.1	6.5	0.2	24.4	0.8	10.7	0.0	0.4	2.9	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	406	1155	979	151	1064	901	336	0	317	355	374	317
V/C Ratio(X)	0.44	0.93	0.26	0.09	0.68	0.04	0.49	0.00	0.03	0.13	0.00	0.36
Avail Cap(c_a), veh/h	469	1290	1093	223	1206	1022	336	0	317	355	374	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.2	15.4	7.8	18.3	13.6	8.5	33.0	0.0	28.9	30.1	0.0	31.0
Incr Delay (d2), s/veh	0.8	10.9	0.1	0.2	1.3	0.0	5.1	0.0	0.2	0.8	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	18.5	1.8	0.1	9.7	0.3	3.7	0.0	0.2	0.9	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	26.3	7.9	18.5	14.9	8.6	38.1	0.0	29.1	30.8	0.0	34.1
LnGrp LOS	B	C	A	B	B	A	D	A	C	C	A	C
Approach Vol, veh/h	1502			768			174			160		
Approach Delay, s/veh	21.5			14.7			37.6			33.2		
Approach LOS	C			B			D			C		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	23.0		6.4	60.5		23.0		10.8	56.1			
Change Period (Y+Rc), s	5.0		5.0	5.0		5.0		5.0	5.0			
Max Green Setting (Gmax), s	18.0		5.0	62.0		18.0		9.0	58.0			
Max Q Clear Time (g_c+I1), s	12.7		2.2	48.1		7.6		5.7	26.4			
Green Ext Time (p_c), s	0.2		0.0	7.5		0.3		0.1	6.0			
Intersection Summary												
HCM 6th Ctrl Delay	21.3											
HCM 6th LOS	C											