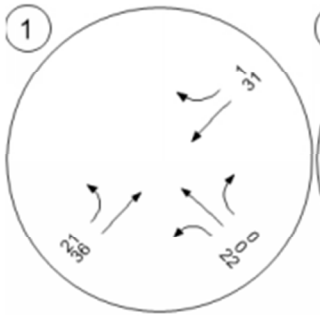
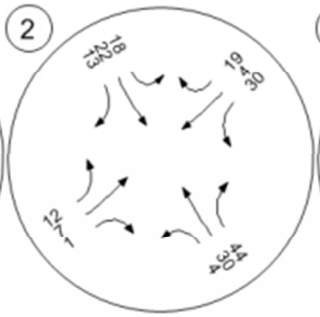
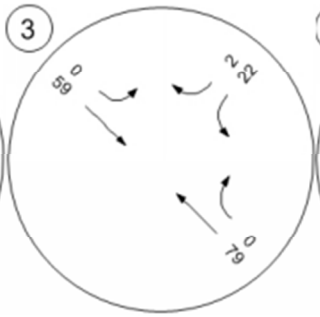
Figure 4-I – Cumulative Projects Only PM Peak Hour Intersection Volumes (in PCE)



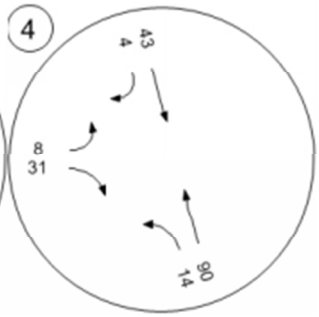
I-215 NB Ramps (NS) / Fair Isle Dr-Box Springs Dr (EW)



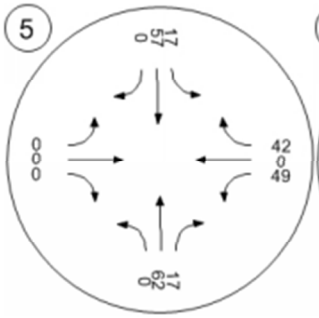
Sycamore Canyon Blvd (NS) / Fair Isle Dr (EW)



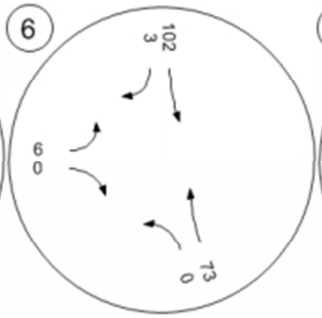
Sycamore Canyon Blvd (NS) / I-215 SB Ramps (EW)



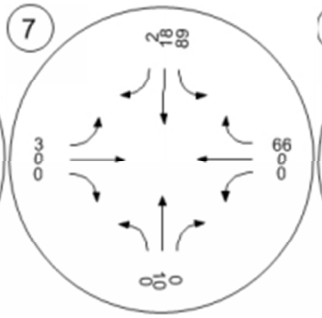
Sycamore Canyon Blvd (NS) / Dan Kipper Dr (EW)



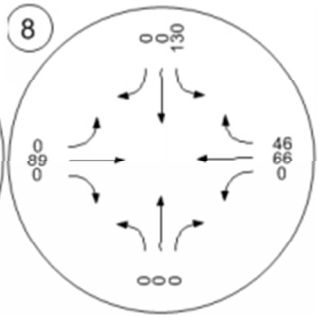
Sycamore Canyon Blvd (NS) / Box Springs Blvd (EW)



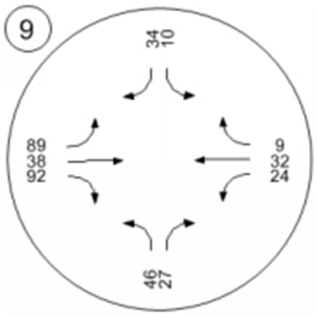
Sycamore Canyon Blvd (NS) / Sierra Ridge Dr (EW)



Sycamore Canyon Blvd (NS) / Eastridge Ave (EW)



Box Springs Blvd (NS) / Eastridge Ave (EW)



I-215 Ramps (NS) / Eastridge Ave-Eucalyptus Ave (EW)

Capacity and Level of Service and Improvement Analysis

Levels of Service – Existing Plus Project Conditions (2015)

The existing plus project scenario includes existing traffic and project traffic. Table 5-1 provides the projected delay and levels of service at the study intersections under existing plus project conditions without off-site improvements. These levels of service vary from LOS B to D. The existing plus project AM and PM peak hour intersection turning movement volumes are shown on Figure 5-A and Figure 5-B, respectively. The levels of service are based upon the existing geometrics for the study intersections. The level of service calculation worksheets are provided in Appendix E. All of the study intersections are expected to operate at the target LOS of D or better during the peak hours and none of the study intersections are expected to operate at an unacceptable level of service.

Table 5-2 presents projected AM and PM peak hour non-PCE volumes, densities and levels of service at the study freeway segments. These levels of service vary from LOS B to D. With the project, all of the study freeway segments are expected to operate at the target LOS of D or better during the peak hours and none of the study freeway segments are expected to be significantly impacted.

Table 5-1 – Intersection Levels of Service – Existing Plus Project Conditions (2015)

Intersection	Peak Hour	Without Project			With Project		
		Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. I-215 Northbound Ramps (NS) Fair Isle Drive-Box Springs Road (EW)	AM PM	Signal	36.7 19.7	D B	Signal	36.8 19.6	D B
2. Sycamore Canyon Boulevard (NS) Fair Isle Drive (EW)	AM PM	Signal	25.6 25.6	C C	Signal	25.9 26.0	C C
3. Sycamore Canyon Boulevard (NS) I-215 Southbound Ramps (EW)	AM PM	Signal	17.5 12.2	B B	Signal	17.7 12.1	B B
4. Sycamore Canyon Boulevard (NS) Dan Kipper Drive (EW)	AM PM	OWSC	12.2 12.0	B B	OWSC	12.3 12.1	B B
5. Sycamore Canyon Boulevard (NS) Box Springs Boulevard (EW)	AM PM	Signal	14.2 12.1	B B	Signal	14.3 12.0	B B
6. Sycamore Canyon Boulevard (NS) Sierra Ridge Drive (EW)	AM PM	Signal	10.3 11.1	B B	Signal	12.7 13.9	B B
7. Sycamore Canyon Boulevard (NS) Eastridge Avenue (EW)	AM PM	Signal	32.6 23.7	C C	Signal	40.9 24.3	D C
8. Box Springs Boulevard (NS) Eastridge Avenue (EW)	AM PM	Signal	31.3 28.2	C C	Signal	31.5 28.8	C C
9. I-215 Ramps (NS) Eastridge Avenue-Eucalyptus Avenue (EW)	AM PM	Signal	24.1 22.8	C C	Signal	23.8 23.3	C C

OWSC = One Way Stop Controlled

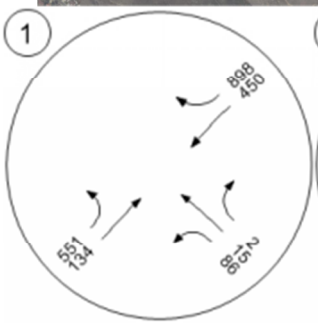
Delay and LOS were calculated in the TIA using Vistro (version 3.00, 2014) for signalized and unsignalized intersections. Per the 2010 Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and LOS for the worst individual movement (or movements sharing a single lane) are shown.

Table 5-2 – Freeway Segment Levels of Service – Existing Plus Project Conditions (2015)

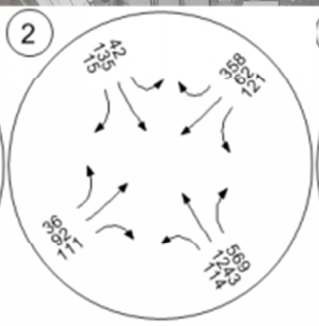
Freeway/Direction of Travel From/To or Junction	Segment Type	Lanes		Without Project				With Project							
				AM Peak Hour		PM Peak Hour		AM Peak Hour				PM Peak Hour			
		Main	Ramp	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Mainline Vol.	Ramp Vol.	Density (pc/mi/ln)	LOS	Mainline Vol.	Ramp Vol.	Density (pc/mi/ln)	LOS
I-215 Northbound															
1. Eastridge-Eucalyptus Off	Diverge	3	1	30.8	D	34.1	D	4586	659	30.9	D	5322	669	34.2	D
2. Eastridge-Eucalyptus On	Merge	3	1	24.6	C	29.6	D	3927	348	24.7	C	4653	550	30.0	D
3. Fair Isle-Box Springs On[1]	Merge	4	1	32.7	D	23.8	C	5819	1337	32.8	D	6897	680	31.2	D
I-215 Southbound															
4. Sycamore Canyon Blvd Off[1]	Basic	5	NA	13.1	B	20.3	C	4540	NA	13.2	B	6771	NA	20.3	C
5. Truck Bypass/Eastridge Off	Weave	4	1	25.2	C	29.4	D	4593	1051	25.5	C	5391	1072	29.5	D
		4	2					5239	405			5567	896		
6. Eastridge-Eucalyptus On	Merge	3	1	24.4	C	29.5	D	4195	380	24.5	C	4498	835	29.6	D

[1] HOV lanes and HOV volumes not included in the mainline volume.
NA = Not applicable
Density and LOS for freeway segments were calculated in the TIA using HCS 2010 (version 6.60, 2014) . Per the 2010 Highway Capacity Manual, freeway segment density and LOS are shown for merge and diverge segments, weaving segments, and basic segments.

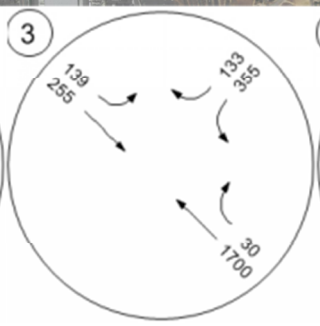
Figure 5-A – Existing Plus Project AM Peak Hour Intersection Volumes (in PCE) (2015)



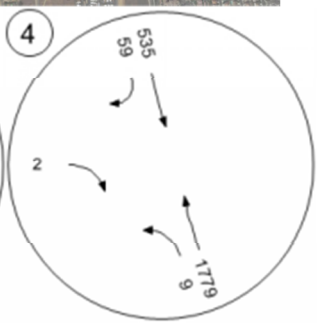
I-215 NB Ramps (NS) / Fair Isle Dr-Box Springs Dr (EW)



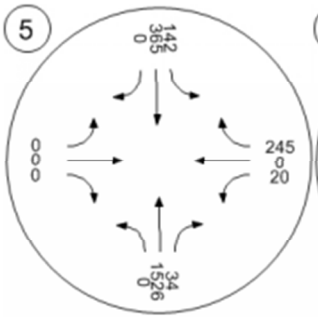
Sycamore Canyon Blvd (NS) / Fair Isle Dr (EW)



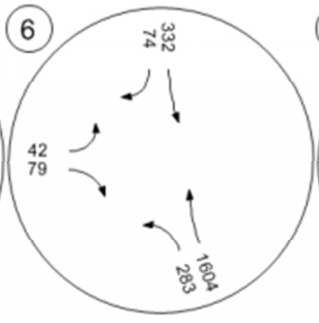
Sycamore Canyon Blvd (NS) / I-215 SB Ramps (EW)



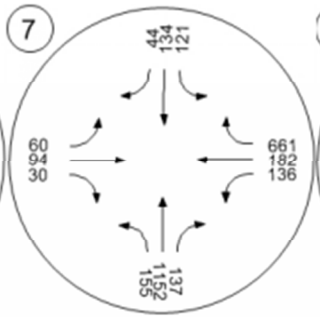
Sycamore Canyon Blvd (NS) / Dan Kipper Dr (EW)



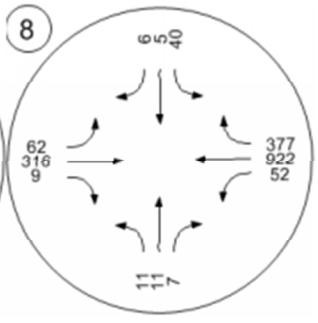
Sycamore Canyon Blvd (NS) / Box Springs Blvd (EW)



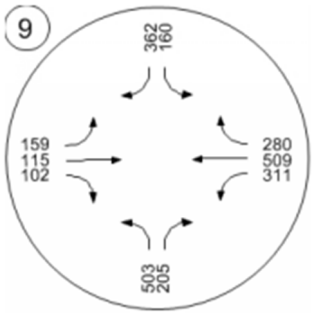
Sycamore Canyon Blvd (NS) / Sierra Ridge Dr (EW)



Sycamore Canyon Blvd (NS) / Eastridge Ave (EW)

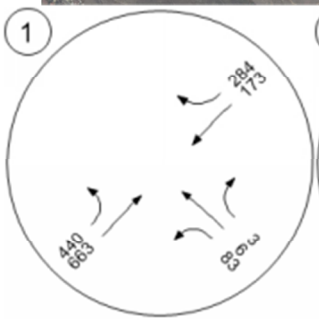


Box Springs Blvd (NS) / Eastridge Ave (EW)

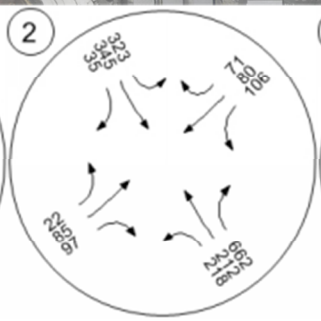


I-215 Ramps (NS) / Eastridge Ave-Eucalyptus Ave (EW)

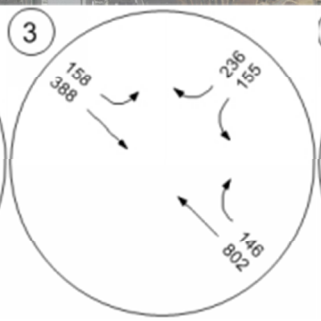
Figure 5-B – Existing Plus Project PM Peak Hour Intersection Volumes (in PCE) (2015)



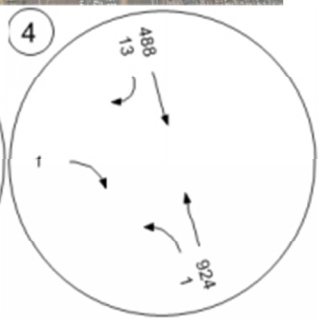
I-215 NB Ramps (NS) / Fair Isle Dr-Box Springs Dr (EW)



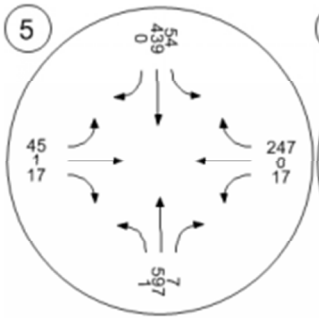
Sycamore Canyon Blvd (NS) / Fair Isle Dr (EW)



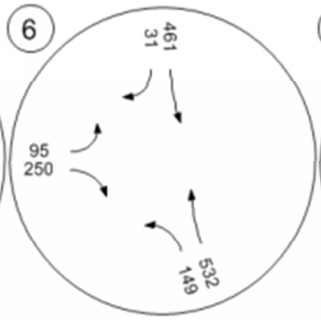
Sycamore Canyon Blvd (NS) / I-215 SB Ramps (EW)



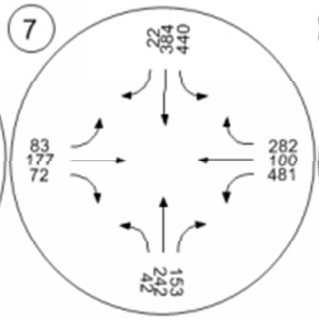
Sycamore Canyon Blvd (NS) / Dan Kipper Dr (EW)



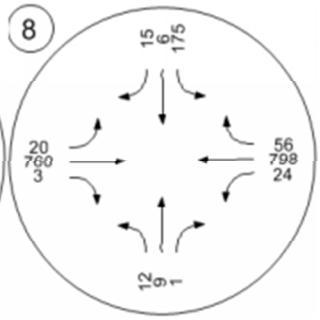
Sycamore Canyon Blvd (NS) / Box Springs Blvd (EW)



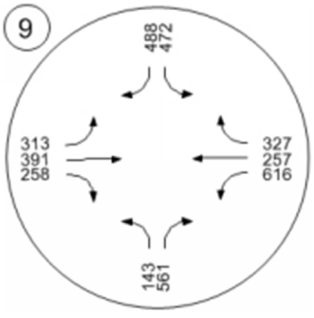
Sycamore Canyon Blvd (NS) / Sierra Ridge Dr (EW)



Sycamore Canyon Blvd (NS) / Eastridge Ave (EW)



Box Springs Blvd (NS) / Eastridge Ave (EW)



I-215 Ramps (NS) / Eastridge Ave-Eucalyptus Ave (EW)

Levels of Service – Existing Plus Ambient Growth Plus Project Conditions (2018)

The existing plus ambient growth plus project scenario includes existing traffic, an ambient growth of two percent for three years to 2018 and project traffic. All other study freeway segments are expected to operate at the target LOS of D or better during the peak hours.

Table 5-3 provides the projected delay and levels of service at the study intersections under existing plus ambient growth plus project conditions without off-site improvements. These levels of service vary from LOS B to D. The existing plus ambient growth plus project AM and PM peak hour intersection turning movement volumes are shown on Figure 5-C and Figure 5-D, respectively. The levels of service are based upon the existing geometrics for the study intersections. The level of service calculation worksheets are provided in Appendix E. All of the study intersections are expected to operate at the target LOS of D or better during the peak hours and none of the study intersections are expected to operate at an unacceptable level of service.

Table 5-4 presents projected AM and PM peak hour non-PCE volumes, densities and levels of service at the study freeway segments. These levels of service vary from LOS B to E. The following study freeway segment is expected to operate at an unacceptable level of service:

I-215 Northbound

1. Eastridge Ave-Eucalyptus Ave Off-Ramp

All other study freeway segments are expected to operate at the target LOS of D or better during the peak hours.

Table 5-3 – Intersection Levels of Service – Existing Plus Ambient Growth Plus Project Conditions (2018)

Intersection	Peak Hour	Without Project			With Project		
		Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. I-215 Northbound Ramps (NS) Fair Isle Drive-Box Springs Road (EW)	AM PM	Signal	39.6 19.4	D B	Signal	39.9 19.6	D B
2. Sycamore Canyon Boulevard (NS) Fair Isle Drive (EW)	AM PM	Signal	28.2 27.2	C C	Signal	28.2 27.6	C C
3. Sycamore Canyon Boulevard (NS) I-215 Southbound Ramps (EW)	AM PM	Signal	18.8 12.3	B B	Signal	19.2 12.3	B B
4. Sycamore Canyon Boulevard (NS) Dan Kipper Drive (EW)	AM PM	OWSC	12.5 12.3	B B	OWSC	12.7 12.4	B B
5. Sycamore Canyon Boulevard (NS) Box Springs Boulevard (EW)	AM PM	Signal	15.8 12.4	B B	Signal	15.9 12.4	B B
6. Sycamore Canyon Boulevard (NS) Sierra Ridge Drive (EW)	AM PM	Signal	10.7 11.3	B B	Signal	13.1 14.1	B B
7. Sycamore Canyon Boulevard (NS) Eastridge Avenue (EW)	AM PM	Signal	35.5 24.5	D C	Signal	44.6 25.4	D C
8. Box Springs Boulevard (NS) Eastridge Avenue (EW)	AM PM	Signal	31.8 28.8	C C	Signal	31.8 29.4	C C
9. I-215 Ramps (NS) Eastridge Avenue-Eucalyptus Avenue (EW)	AM PM	Signal	23.8 22.5	C C	Signal	23.5 22.7	C C

OWSC = One Way Stop Controlled
Delay and LOS were calculated in the TIA using Vistro (version 3.00, 2014) for signalized and unsignalized intersections. Per the 2010 Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with a traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and LOS for the worst individual movement (or movements sharing a single lane) are shown.

Table 5-4 – Freeway Segment Levels of Service – Existing Plus Ambient Growth Plus Project Phase Conditions (2018)

Freeway/Direction of Travel From/To or Junction	Seg-ment Type	Lanes		Without Project				With Project							
				AM Peak Hour		PM Peak Hour		AM Peak Hour				PM Peak Hour			
		Main	Ramp	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Mainline Vol.	Ramp Vol.	Density (pc/mi/ln)	LOS	Mainline Vol.	Ramp Vol.	Density (pc/mi/ln)	LOS
I-215 Northbound															
1. Eastridge-Eucalyptus Off	Diverge	3	1	32.1	D	***35.5***	***E***	4860	698	32.2	D	5641	709	***35.6***	***E***
2. Eastridge-Eucalyptus On	Merge	3	1	25.9	C	31.3	D	4163	368	26.0	C	4932	581	31.6	D
3. Fair Isle-Box Springs On[1]	Merge	4	1	23.7	C	27.6	C	6167	1417	23.9	C	7308	720	28.0+	D
I-215 Southbound															
4. Sycamore Canyon Blvd Off[1]	Basic	5	NA	13.8	B	21.8	C	4810	NA	14.0	B	7176	NA	21.9	C
5. Truck Bypass/Eastridge Off	Weave	4	1	27.1	C	31.6	D	4867	1114	27.3	C	5714	1136	31.7	D
		4	2					5554	427			5901	949		
6. Eastridge-Eucalyptus On	Merge	3	1	25.9	C	31.3	D	4447	402	25.9	C	4768	884	31.4	D

[1] HOV lanes and HOV volumes not included in the mainline volume.
+ = Density is above LOS threshold. Number shown has been rounded down to the nearest tenth.
NA = Not aplicable
Density and LOS for freeway segments were calculated in the TIA using HCS 2010 (version 6.60, 2014) . Per the 2010 Highway Capacity Manual, freeway segment density and LOS are shown for merge and diverge segments, weaving segments, and basic segments.

Levels of Service – Existing Plus Ambient Growth Plus Project with Improvements (2018)

Table 5-5 provides the projected delay and levels of service at the study freeway segments under existing plus ambient growth plus project conditions with off-site improvements. The off-site improvement assumed in this scenario is the I-215 North Project (http://www.rctc.org/projects/interstate-215/i-215-north-project), which proposes to add one carpool lane in each direction on I-215 between Nuevo Road and the 60/215 Interchange. This project is funded by Measure A and is considered a "longer range" project by RCTC. With the off-site improvements presented in Table 6-4, the study freeway segments would operate at the target LOS of D or better during the peak hours. The level of service calculation worksheets are provided in Appendix E.

Table 5-5 – Freeway Segment Levels of Service – Existing Plus Ambient Growth Plus Project with Improvements (2018)

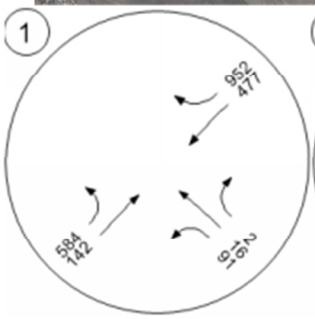
Freeway/Direction of Travel From/To or Junction	Segment Type	Without Improvements										With Improvements					
		Lanes		Without Project				With Project				Lanes		With Project			
				AM Peak		PM Peak		AM Peak		PM Peak				AM Peak		PM Peak	
		Main	Ramp	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Main	Ramp	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
I-215 Northbound																	
1. Eastridge-Eucalyptus Off[1]	Diverge	3	1	32.1	D	***35.5***	***E***	32.2	D	***35.6***	***E***	3	1	27.3	C	32.1	D

XX - Exceeds Target LOS

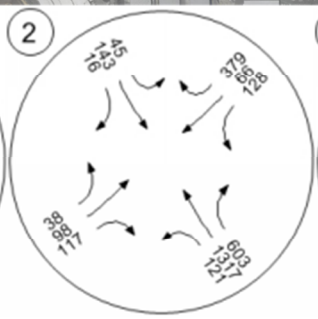
[1] I-215 North Project - Adds one HOV lane in both directions from Nuevo Road to the 60/215 Interchange. Based on the HOV volumes at Box Springs/Fair-Isle, the HOV lane carries approx. 80% of a multi-flow lane in the AM peak and 50% in the PM peak. Therefore the volumes in the multi-flow lanes will be reduced with the project.

Density and LOS for freeway segments were calculated in the TIA using HCS 2010 (version 6.60, 2014) . Per the 2010 Highway Capacity Manual, freeway segment density and LOS are shown for merge and diverge segments, weaving segments, and basic segments.

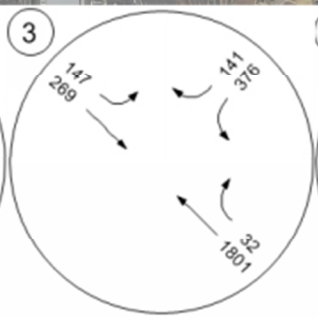
Figure 5-C – Existing Plus Ambient Growth Plus Project AM Peak Hour Intersection Volumes (in PCE) (2018)



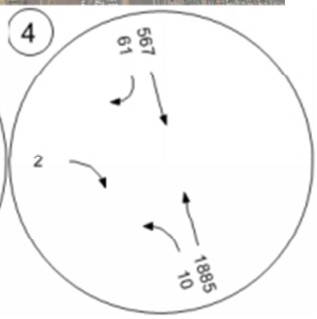
I-215 NB Ramps (NS) / Fair Isle Dr-Box Springs Dr (EW)



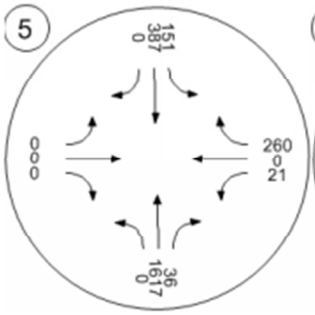
Sycamore Canyon Blvd (NS) / Fair Isle Dr (EW)



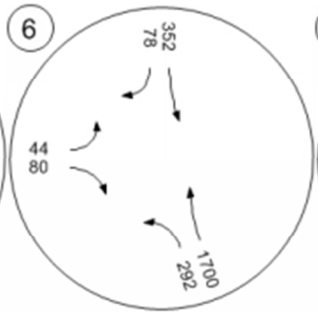
Sycamore Canyon Blvd (NS) / I-215 SB Ramps (EW)



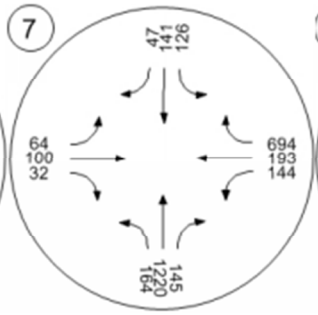
Sycamore Canyon Blvd (NS) / Dan Kipper Dr (EW)



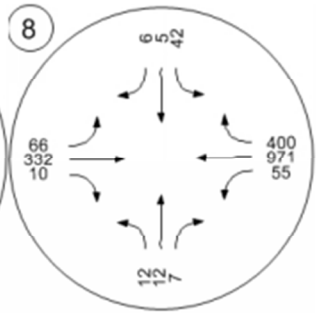
Sycamore Canyon Blvd (NS) / Box Springs Blvd (EW)



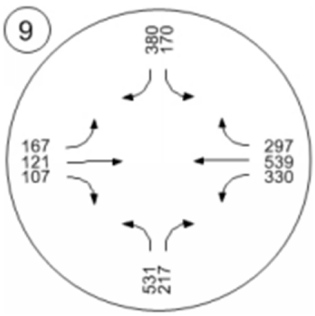
Sycamore Canyon Blvd (NS) / Sierra Ridge Dr (EW)



Sycamore Canyon Blvd (NS) / Eastridge Ave (EW)



Box Springs Blvd (NS) / Eastridge Ave (EW)



I-215 Ramps (NS) / Eastridge Ave-Eucalyptus Ave (EW)