

Ledge Rock Center

Traffic Impact Study

Ledge Rock Center, LLC

Johnstown, Colorado

October 13, 2021

Prepared By:



Sustainable Traffic Solutions, Inc.

<http://www.sustainabletrafficsolutions.com/>

Joseph L. Henderson, PE, PTOE

303.589.6875

joe@sustainabletrafficsolutions.com

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Ledge Rock Center

Traffic Impact Study

1.0 Introduction

A commercial and residential development is planned in the southeast quadrant of the I-25 / SH 60 interchange. Figure 1 contains a vicinity map showing the location of the site, and Figure 2 contains the site plan. Also shown in Figure 2 are development areas that help to define the phasing of the development. The project will be constructed in three phases with the commercial land uses in Areas A and B, the hotels in Area G, and half of the multifamily housing in Area C constructed in Phase 1; the balance of the multifamily housing constructed in Phase 2; and the single-family homes constructed in Phase 3. To provide access to the development, High Plains Boulevard will be extended through the development and WCR 11 will be constructed south of SH 60. All of the public improvements will be constructed in Phase 1. The area southwest of High Plains Boulevard / Street A is not included in the development because the majority of the area is already developed with oil and gas facilities.

This traffic study was based on the requirements contained in the State Highway Access Code¹ (SHAC).

2.0 Project Description

2.1 Study Area

The study area includes the following intersections.

- SH 60 / High Plains Boulevard
- SH 60 / WCR 11 / Faith Lutheran Church east access
- SH 60 / Carlson Boulevard
- Future right-in/right-out accesses on SH 60 (two locations)
- High Plains Boulevard / four future intersections
- WCR 11 / two future intersections
- Street A / 11 future intersections
- Five future intersections in the single-family portion of the development south of Street A
- High Plains Boulevard / WCR 50 (Year 2041 only)
- High Plains Boulevard / WCR 46 (Year 2041 only)

¹ State Highway Access Code. The Transportation Commission of Colorado. Amended March 2002.

The existing laneage and traffic control are contained in Figure 3.

The classifications shown in Figure 1 are based on Figure 11 of the Town of Johnstown Transportation Master Plan².

2.2 Study Assumptions

The following assumptions were utilized for this study.

- **Adjustment of Traffic Count Data for COVID 19.** Historic traffic count data was used to adjust the traffic counts collected for this project to compensate for the effect of COVID 19. The historic data was obtained from Count Station 101434, a continuous count station on US 34 west of I-25. The data from the count station showed that volumes in May 2021 decreased by 4% compared to the average of May 2018 and 2019. Therefore, the volumes collected for the study were inflated by 4% to compensate for the impact of COVID 19. The table with the data from Count Station 101434 is contained in Appendix A.
- **Phase I.** Phase I will include the commercial development in Areas A and B, the hotels in Area G, and half of the multifamily housing in Area C (see Figure 2). That portion of the development is expected to be completed by Year 2025.
- **Phase II.** The balance of the multifamily housing in Area C plus all of the multifamily housing in Area D will be constructed in Phase II (see Figure 2). That portion of the development is expected to be completed by Year 2027.
- **Phase III.** The single-family homes will be constructed in Phase III. In Figure 2, the single-family homes are included in Areas E and F. That development is expected to be completed by Year 2030.
- **Long-Term Planning Horizon.** The long-term planning horizon is Year 2041 because it is 20 years in the future.
- **Growth in Background Traffic.** Information from the North I-25 Parallel Arterial Study³ was used to develop growth rates and future daily volumes on SH 60 and High Plains Boulevard. The annual growth rates used in the study include:
 - SH 60 east and west of High Plains Boulevard – 3.5%
 - High Plains Boulevard north of SH 60 – 13.1%

Traffic volumes on Carlson Boulevard north and south of SH 60 are expected to grow at 2% annually based on information that is contained in Letford

² Town of Johnstown Transportation Master Plan. Felsburg Holt & Ullevig. February 2008.

³ North I-25 Parallel Arterial Study. Cambridge Systematics, Inc. April 17, 2020.

Elementary School Relocation Traffic Impact Study⁴. Peak Hour traffic volumes for the school were obtained from the study and included in the analysis of SH 60 / Carlson Boulevard.

- **Year 2041 Traffic Volumes.** The Year 2041 peak hour volumes for the High Plains Boulevard intersections with SH 60, WCR 50, and WCR 46 were derived from the volumes contained in Figure C.1 and Figure C.2 of the North I-25 Parallel Arterial Study.
- **Saturation Flow Rate.** The saturation flow rate was assumed to be 1,900 passenger cars / hour / lane.
- **Improvements to Adjacent Roadways.** The Town of Johnstown Transportation Master Plan was reviewed to determine if capacity improvements are planned for roadways in the study area. Figure 9 from the TMP shows that High Plains Boulevard is expected to be a four-lane arterial roadway with portions only requiring two lanes by the Year 2035. SH 60 will be widened to four or six lanes east of I-25.
- **Peak Hour Factor (PHF).** For the existing and the short-term planning horizons, the PHF was based on the data collected for the traffic study. At new intersections and intersections with low traffic volumes, the PHF was assumed to be 0.85 for all movements in all of the planning horizons. At the intersections on SH 60 and High Plains Boulevard, the PHF was assumed to be 0.92 in the long-term horizon unless the existing PHF is higher than 0.92. In that case, the existing PHF was used in the analysis of the long-term volumes.
- **Truck Percentage.** A truck percentage of 4% was assumed on SH 60 based on data collected for the study. 2% trucks were assumed on all other roadways.

3.0 Existing Traffic Volumes

Traffic count data were collected for the project on Wednesday May 13, 2021 by All Traffic Data. The factored peak hour volumes are summarized in Figures 4 and 5. Existing, factored, and future daily volumes are summarized in Table 1. The traffic count data are contained in Appendix A.

3.1 Level of Service Analysis

To evaluate the performance of the intersections within the study area, the level of service (LOS) was calculated using PTV VISTRO software. This software package utilizes criteria described in the Highway Capacity Manual⁵. LOS is a measure used to describe operational conditions at an intersection. LOS categories ranging from A

⁴ Letford Elementary School Relocation Traffic Impact Study. Fox Tuttle Transportation Group. February 11, 2021.

⁵ Highway Capacity Manual, 6th Edition. Transportation Research Board. 2016.

to F are assigned based on the predicted delay in seconds per vehicle for the intersection as a whole, as well as for individual turning movements. LOS A indicates very good operations, and LOS F indicates poor, congested operations. In Johnstown, the minimum acceptable intersection operation is LOS D.

The results of the analysis are summarized in the following table. The analysis shows that the SH 60 intersections at High Plains Boulevard and the church access are operating at acceptable levels of service. SH 60 / Carlson Boulevard is operating at LOS F during both peak hours. Factored turning movement counts were used for the analysis.

Intersection	Control	Peak Hour	
		AM	PM
1 - SH 60 / High Plains Boulevard	Side-Street Stop	C	D
2 - SH 60 / WCR 11 / Church Access	Side-Street Stop	C	C
3 - SH 60 / Carlson Boulevard	Side-Street Stop	F	F

The level of service for stop-controlled intersections is based on the lowest letter grade for the side-street movements. The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

4.0 Site Generated Traffic Volumes

4.1 Trip Generation

In order to estimate the traffic impacts associated with this development, the amount of traffic generated by the project was calculated using trip generation rates contained in the Institute of Transportation Engineers (ITE) Trip Generation manual⁶ (see Table 3).

Considering the mix of uses that are proposed, it is likely that a person entering this development will visit more than one of the businesses before exiting the development. It is also likely that people living in the Ledge Rock Center will shop at one or more of the businesses in the development. This behavior is referred to as “internal capture”. The internal capture was estimated using methods that are contained in NCHRP 684⁷ which is also included in Table 3. The calculation of the internal capture trips is contained in Appendix C.

Not all of the trips generated by commercial developments represent new trips added to the adjacent street network. Pass-by trips are made by motorists already using the street network as intermediate stops on the way to a primary trip destination without diverting from the route. Therefore, these trips are deducted from the traffic

⁶ Trip Generation, 10th Edition. Institute of Transportation Engineers. September 2017.

⁷ Enhancing Internal Trip Capture Estimation for Mixed-Use Developments: NCHRP 684. Transportation Research Board. 2011.

passing by the site. The pass-by trips for the retail development were estimated using information that is contained in the Trip Generation Handbook⁸. Considering the volume of through traffic on SH 60 and High Plains Boulevard, the pass-by trips were not included in the analysis because including them would not impact the level of service at the arterial intersections.

4.2 Trip Distribution and Assignment

The short-term trip distribution for the development is contained in Figure 6. It is based on the existing peak hour volumes collected for the traffic study. The long-term trip distribution that is contained in Figure 7 is based on the Year 2041 traffic volumes. The peak hour assignments are contained in Figures 8 through 15.

5.0 Year 2025 Traffic Conditions

Construction of Phase I is expected to be completed and occupied in Year 2025. Background traffic volumes for the Year 2025 were developed by inflating the factored traffic volumes on SH 60 and High Plains Boulevard by the growth rates that were discussed in Section 2.2. The background traffic volume scenarios are contained in Figures 16 and 17. The Year 2025 total traffic volume scenarios were developed by adding the trip assignment to the background volumes. The Year 2025 total traffic volume scenarios are contained in Figures 18 and 19.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. All of the intersections are expected to operate at LOS D, or better, in the total traffic volume scenarios except for SH 60 / WCR 11 and Intersection 7 during the evening peak hour. Neither intersection is expected to warrant signalization at the completion of Phase I, so they will have side-street stop-control. It is not unusual for intersections on an arterial street with side-street stop control to operate poorly. The level of service for stop-controlled intersections is based on the lowest letter grade for the side-street movements. Intersections 4 and 5 are right-in/right-out accesses on SH 60. They were modeled with side-street stop-control, however, the side-street traffic will likely be controlled with a yield sign so the operation will be better than reported. The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

⁸ Trip Generation Handbook. Institute of Transportation Engineers. September 2017.

Intersection	Background			Total		
	Control	AM	PM	Control	AM	PM
1 - SH 60 / High Plains Boulevard	Side-Street Stop	D	F	Signal	C	D
2 - SH 60 / WCR 11 / Church Access	Side-Street Stop	C	C	Side-Street Stop	E	F
3 - SH 60 / Carlson Boulevard	Signal	B	B	Signal	B	B
4 - SH 60 / Site Access	--	--	--	Side-Street Stop	A	C
5 - SH 60 / Site Access	--	--	--	Side-Street Stop	A	B
6 - High Plains Boulevard / Commercial Access	--	--	--	Side-Street Stop	A	B
7 - High Plains Boulevard / Commercial Access	--	--	--	Side-Street Stop	B	F
8 - High Plains Boulevard / Street A	--	--	--	Side-Street Stop	A	A
13 - Street A / Site Access	--	--	--	Side-Street Stop	A	A
16 - Street A / Street F	--	--	--	Side-Street Stop	A	A
17 - Street A / Site Access	--	--	--	Side-Street Stop	A	A
18 - Street A / Street G	--	--	--	Side-Street Stop	A	B
32 - WCR 11 / Hotel Access	--	--	--	Side-Street Stop	A	B

6.0 Year 2027 Traffic Conditions

Construction of Phase II is expected to be completed and occupied in Year 2027. The background and total traffic volumes were developed as discussed in Section 5.0. Figures 20 and 21 contain the background volumes, and the total traffic volumes are contained in Figures 22 and 23.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. All of the intersections are expected to operate at LOS D, or better, in the total traffic volume scenarios. The exception is Intersection 7 during the evening peak hour. This intersection is not expected to warrant signalization at the completion of Phase II, so it will have side-street stop-control. It is not unusual for intersections on an arterial street with side-street stop control to operate poorly. The level of service for stop-controlled intersections is based on the lowest letter grade for the side-street movements. Intersections 4 and 5 are right-in/right-out accesses on SH 60. They were modeled with side-street stop-control, however, the side-street traffic will likely be controlled with a yield sign so the operation will be better than reported. The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

Intersection	Background			Total		
	Control	AM	PM	Control	AM	PM
1 - SH 60 / High Plains Boulevard	Signal	C	D	Signal	C	D
2 - SH 60 / WCR 11 / Church Access	Side-Street Stop	F	F	Signal	A	A
3 - SH 60 / Carlson Boulevard	Signal	B	B	Signal	B	B
4 - SH 60 / Site Access	Side-Street Stop	A	D	Side-Street Stop	A	D
5 - SH 60 / Site Access	Side-Street Stop	A	B	Side-Street Stop	A	B
6 - High Plains Boulevard / Commercial Access	Side-Street Stop	A	B	Side-Street Stop	A	B
7 - High Plains Boulevard / Commercial Access	Side-Street Stop	B	F	Side-Street Stop	B	F
8 - High Plains Boulevard / Street A	Side-Street Stop	A	A	Side-Street Stop	A	B
13 - Street A / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	A
14 - Street A / Site Access	---	---	---	Side-Street Stop	A	A
15 - Street A / Site Access	---	---	---	Side-Street Stop	A	A
16 - Street A / Street F	Side-Street Stop	A	A	Side-Street Stop	A	B
17 - Street A / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	B
18 - Street A / Street G	Side-Street Stop	A	A	Side-Street Stop	B	B
32 - WCR 11 / Hotel Access	Side-Street Stop	A	B	Side-Street Stop	A	B
34 - High Plains Boulevard / Site Access	---	---	---	Side-Street Stop	A	A

7.0 Year 2030 Traffic Conditions

Construction of Phase III is expected to be completed and occupied in Year 2030. The background and total traffic volumes were developed as discussed in Section 5.0. Figures 24 and 25 contain the background volumes, and the total traffic volumes are contained in Figures 26 and 27.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. All of the intersections are expected to operate at LOS D, or better, in the total traffic volume scenarios. The exceptions are Intersection 4 which is expected to operate at LOS E during the evening peak hour and Intersection 7 which is expected to operate at LOS F during the evening peak hour. Intersections 4 and 5 are right-in/right-out accesses on SH 60. They were modeled with side-street stop-control, however, the side-street traffic will likely be controlled with a yield sign so the operation will be better than reported. Intersection 7 is not expected to warrant signalization at the completion of Phase III, so it will have side-street stop-control. It is not unusual for intersections on an arterial street with side-street stop control to operate poorly. The level of service for stop-controlled intersections is based on the lowest letter grade for the side-street movements. The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

Intersection	Background			Total		
	Control	AM	PM	Control	AM	PM
1 - SH 60 / High Plains Boulevard	Signal	C	D	Signal	C	D
2 - SH 60 / WCR 11 / Church Access	Signal	A	A	Signal	B	A
3 - SH 60 / Carlson Boulevard	Signal	B	B	Signal	B	B
4 - SH 60 / Site Access	Side-Street Stop	A	D	Side-Street Stop	B	E
5 - SH 60 / Site Access	Side-Street Stop	A	C	Side-Street Stop	A	C
6 - High Plains Boulevard / Commercial Access	Side-Street Stop	A	B	Side-Street Stop	A	B
7 - High Plains Boulevard / Commercial Access	Side-Street Stop	B	F	Side-Street Stop	B	F
8 - High Plains Boulevard / Street A	Side-Street Stop	A	A	Side-Street Stop	A	A
13 - Street A / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	A
14 - Street A / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	A
15 - Street A / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	A
16 - Street A / Street F	Side-Street Stop	A	B	Side-Street Stop	A	B
17 - Street A / Site Access	Side-Street Stop	A	B	Side-Street Stop	B	B
18 - Street A / Street G	Side-Street Stop	B	B	Side-Street Stop	B	B
19 - Street A / Street D	--	--	--	Side-Street Stop	B	B
20 - Street A / Street E	--	--	--	Side-Street Stop	B	B
32 - WCR 11 / Hotel Access	Side-Street Stop	B	B	Side-Street Stop	A	B
33 - WCR 11 / Street E	--	--	--	Side-Street Stop	B	B
34 - High Plains Boulevard / Site Access	Side-Street Stop	A	A	Side-Street Stop	A	A

8.0 Year 2041 Traffic Conditions

The Year 2041 background and total traffic volumes were developed as discussed in Section 5.0. Figures 28 and 29 contain the background volumes, and the total traffic volumes are contained in Figures 30 and 31. The traffic patterns are different between the Year 2041 scenario and the previous scenarios because the network is expected to be complete by Year 2041.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. All of the intersections are expected to operate at LOS D, or better, in the total traffic volume scenarios with the exception of Intersection 34 during the evening peak hour. This intersection will have side-street stop-control and it is not unusual for intersections on an arterial street with side-street stop control to operate poorly. The level of service for stop-controlled intersections is based on the lowest letter grade for the side-street movements. Intersections 4 and 5 are right-in/right-out accesses on SH 60. They were modeled with side-street stop-control, however, the side-street traffic will likely be controlled with a yield sign so the operation will be better than reported. The operation of some of the intersections

improved from the Year 2030 traffic volume scenarios to the Year 2041 traffic volume scenarios due to the PHF assumed for each scenario. The laneage and traffic control assumed for the analysis are contained in Figure 32. The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

Intersection	Background			Total		
	Control	AM	PM	Control	AM	PM
1 - SH 60 / High Plains Boulevard	Signal	D	C	Signal	D	D
2 - SH 60 / WCR 11 / Church Access	Side-Street Stop	D	D	Signal	A	A
3 - SH 60 / Carlson Boulevard	Signal	B	B	Signal	B	B
4 - SH 60 / Site Access	--	--	--	Side-Street Stop	A	D
5 - SH 60 / Site Access	--	--	--	Side-Street Stop	B	B
6 - High Plains Boulevard / Commercial Access	--	--	--	Side-Street Stop	B	C
7 - High Plains Boulevard / Commercial Access	--	--	--	Signal	A	B
8 - High Plains Boulevard / Street A	--	--	--	Signal	B	B
13 - Street A / Site Access	--	--	--	Side-Street Stop	A	A
14 - Street A / Site Access	--	--	--	Side-Street Stop	B	B
15 - Street A / Site Access	--	--	--	Side-Street Stop	A	A
16 - Street A / Street F	--	--	--	Side-Street Stop	A	B
17 - Street A / Site Access	--	--	--	Side-Street Stop	A	A
18 - Street A / Street G	--	--	--	Side-Street Stop	B	B
19 - Street A / Street D	--	--	--	Side-Street Stop	A	A
20 - Street A / Street E	--	--	--	Side-Street Stop	B	B
27 - High Plains Boulevard / WCR 50	Signal	C	C	Signal	C	C
28 - High Plains Boulevard / WCR 46	Signal	B	B	Signal	B	B
32 - WCR 11 / Hotel Access	--	--	--	Side-Street Stop	B	B
33 - WCR 11 / Street E	--	--	--	Side-Street Stop	A	A
34 - High Plains Boulevard / Site Access	--	--	--	Side-Street Stop	D	F

9.0 Auxiliary Turn Lanes

The need for left turn and right turn deceleration and right turn acceleration lanes was reviewed based on criteria that are contained in the State Highway Access Code⁹ (SHAC). The following classifications apply to roadways in the study area.

- SH 60 is classified as an NR-A roadway and the speed limit is 55 MPH in the vicinity of the site.

⁹ [State Highway Access Code](#). The Transportation Commission of Colorado. Amended March 2002.

- High Plains Boulevard is classified as a principal arterial by the Town. Based on Table 6 in the Town of Johnstown Transportation Master Plan, SHAC NR-A criteria apply to principal arterials. The speed limit was assumed to be 35 MPH on High Plains Boulevard.
- WCR 11 and Street A are expected to be classified as major collector streets. Based on Table 6 in the Town of Johnstown Transportation Master Plan, SHAC NR-C criteria apply to collector streets. The speed limit was assumed to be 35 MPH on WCR 11.

A review of the need for auxiliary lanes on SH 60, High Plains Boulevard, and WCR 11 is contained in Table 4. The recommended lengths of the auxiliary lanes are contained in Table 5.

10.0 Traffic Signal Warrant Studies

Traffic signal warrant studies were performed to determine which intersections will warrant signalization. They were performed based on the requirements contained in the Manual on Uniform Traffic Control Devices¹⁰. Considering the data available to evaluate the warrants, the peak hour warrant was evaluated.

The following assumptions were used for the analysis.

- **Speed Limit.** The posted speed limit is 55 MPH on SH 60 and assumed to be 35 MPH on High Plains Boulevard.
- **Number of Main-Street Lanes.** On SH 60, two lanes were assumed at High Plains Boulevard and WCR 11, and one lane was assumed at Carlson Boulevard. On High Plains Boulevard, two lanes were assumed.
- **Number of Side-Street Lanes.** The following side-street lanes were assumed at each intersection.
 - SH 60 / High Plains Boulevard – two lanes
 - SH 60 / WCR 11 – one lane
 - SH 60 / Carlson Boulevard – one lane
 - High Plains Boulevard / Commercial Access (Intersection 7) – one lane
 - High Plains Boulevard / Street A (Intersection 8) – one lane
- **Side-Street Right Turning Traffic.** 50% of the right turning traffic was included in the warrant because some vehicles will be able to turn into gaps in traffic without the aid of a traffic signal.

The analysis shows that traffic signals will be warranted during the following traffic volume scenarios.

- SH 60 / High Plains Boulevard – Year 2025 total traffic
- SH 60 / WCR 11 – Year 2027 total traffic
- SH 60 / Carlson Boulevard – Year 2025 background traffic

¹⁰ Manual on Uniform Traffic Control Devices. Federal Highway Administration. Revised May 2012.

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- High Plains Boulevard / Commercial Access (Intersection 7) – Year 2041 total traffic
 - High Plains Boulevard / Street A (Intersection 8) – Year 2041 total traffic

The signal warrant analysis is contained in Appendix D.

11.0 Signal Progression Analysis

A progression analysis was performed for High Plains Boulevard using PTV VISTRO software to show the peak hour progression in Year 2041. Time-space diagrams were prepared that show that two-way progression will be possible between Intersections 7 and 8 during both peak hours. The time-space diagrams contained in Appendix E show that between 42% and 50% green band efficiency can be achieved between the two signals. The signal at SH 60 was not included in the analysis because traffic would be expected to stop at SH 60 due to the limited amount for green time for north/south traffic.

12.0 Conclusions

STS has drawn the following conclusions based on the analysis performed for this project.

- **Intersection Operation.** The operation of the intersections was analyzed using PTV VISTRO software. All of the intersections are expected to operate at LOS D, or better, in the total traffic volume scenarios with the following exceptions.
 - **SH 60 / WCR 11.** This intersection is expected to operate at LOS E and LOS F following the completion of Phase I because it is not expected to warrant signalization until the completion of Phase II. Once the intersection is signalized, it is expected to operate at acceptable levels of service.
 - **Intersection 4.** This is one of two right-in/right-out intersections that are planned on SH 60. It is expected to operate at LOS E in the Year 2030 evening peak hour traffic volume scenario. The right-in/right-out intersections were modeled as stop controlled intersections, however, they will likely have yield control and operate better than reported.
 - **Intersection 7.** This intersection is expected to operate at LOS F during the evening peak hour until it warrants signalization when High Plains Boulevard is extended south to WCR 46.
 - **Intersection 34.** This intersection is expected to operate at LOS F during the Year 2041 evening peak hour traffic volume scenario.
- **Auxiliary Lanes.** Tables 4 and 5 summarize the need for auxiliary lanes and length of the lanes.

-
- **Traffic Signal Warrant Studies.** The following intersections are expected to warrant signalization.
 - SH 60 / High Plains Boulevard – Year 2025 total traffic
 - SH 60 / WCR 11 – Year 2027 total traffic
 - SH 60 / Carlson Boulevard – Year 2025 background traffic
 - High Plains Boulevard / Commercial Access (Intersection 7) – Year 2041 total traffic
 - High Plains Boulevard / Street A (Intersection 8) – Year 2041 total traffic
 - **Signal Progression Analysis.** A signal progression analysis was performed for Intersections 7 and 8 on High Plains Boulevard to show the expected progression in Year 2041. The results of the analysis show that two-way progression will be possible during both peak hours with a green band efficiency between 42% and 50%. The signal at SH 60 was not included in the analysis because traffic would be expected to stop at SH 60 due to the limited amount for green time for north/south traffic.

Figure 32 – Laneage and Traffic Control – Year 2041

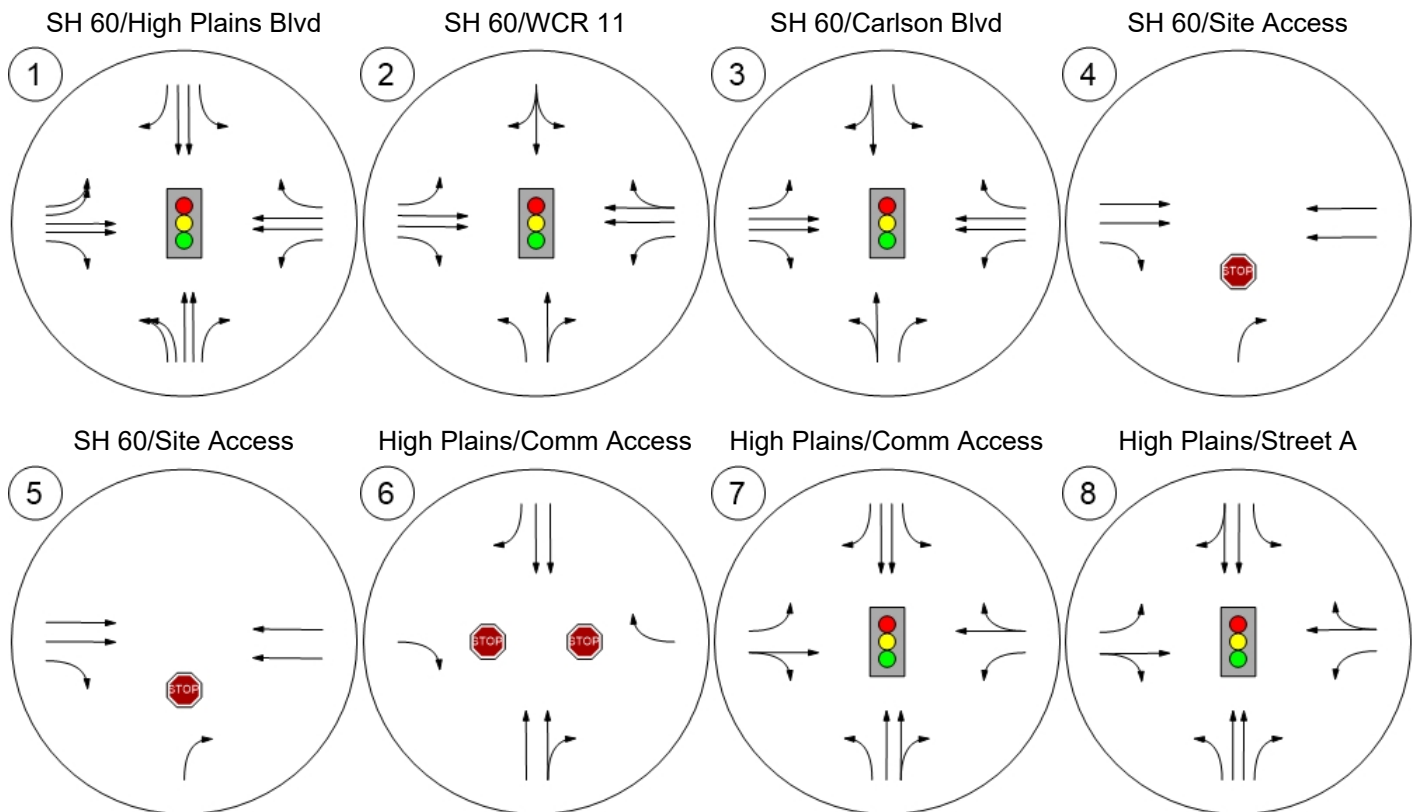
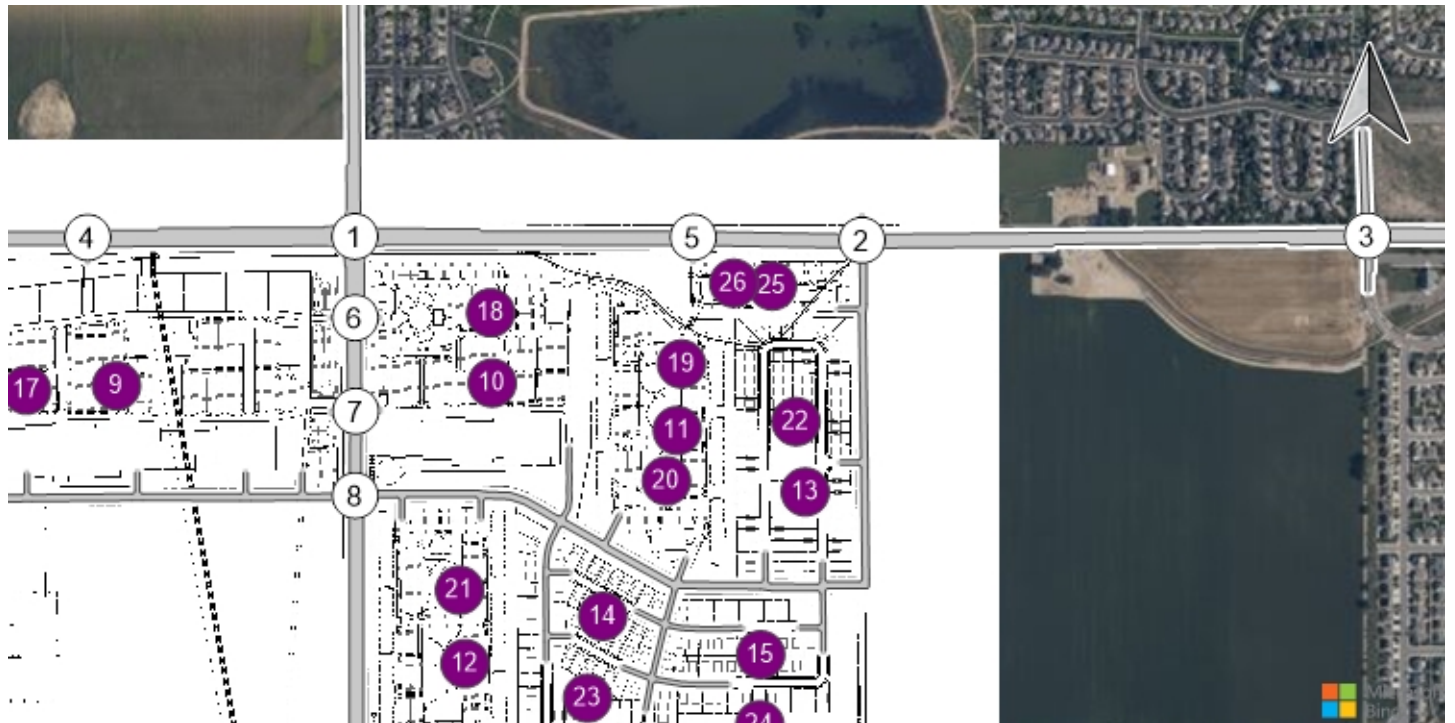


Figure 30 – Year 2041 Total Traffic Volumes – Morning Peak Hour

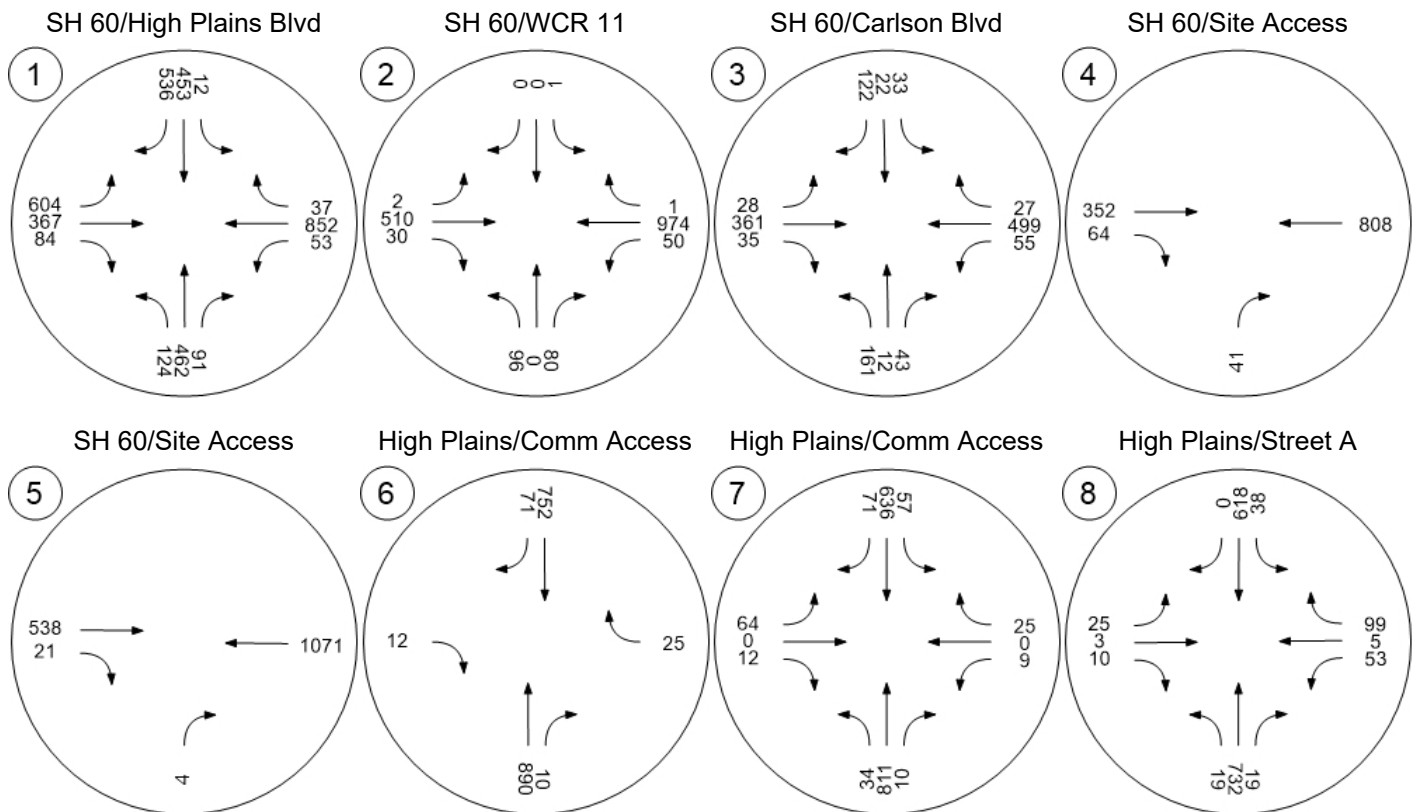


Figure 14 – Long Term Trip Assignment – Morning Peak Hour

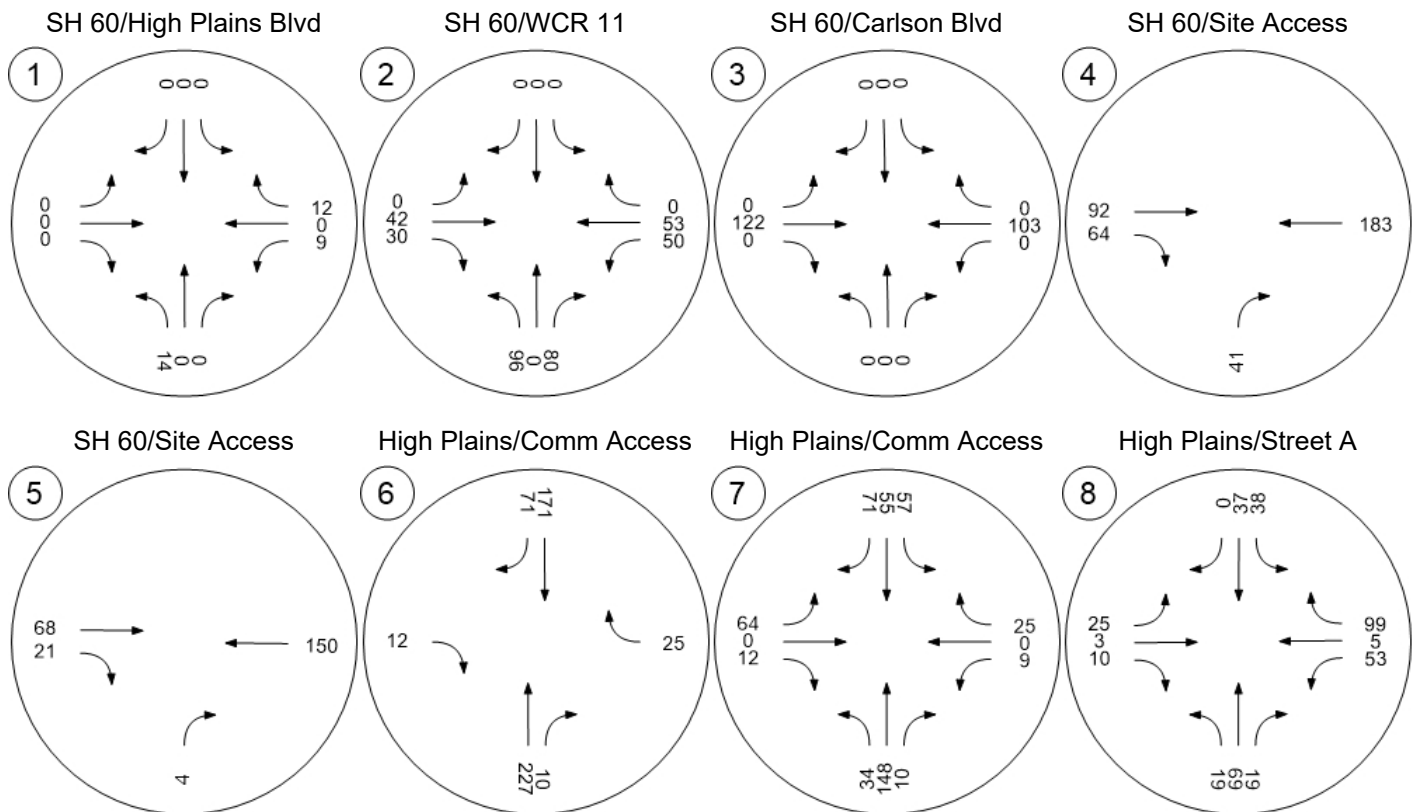


Figure 28 – Year 2041 Background Traffic Volumes – Morning Peak Hour

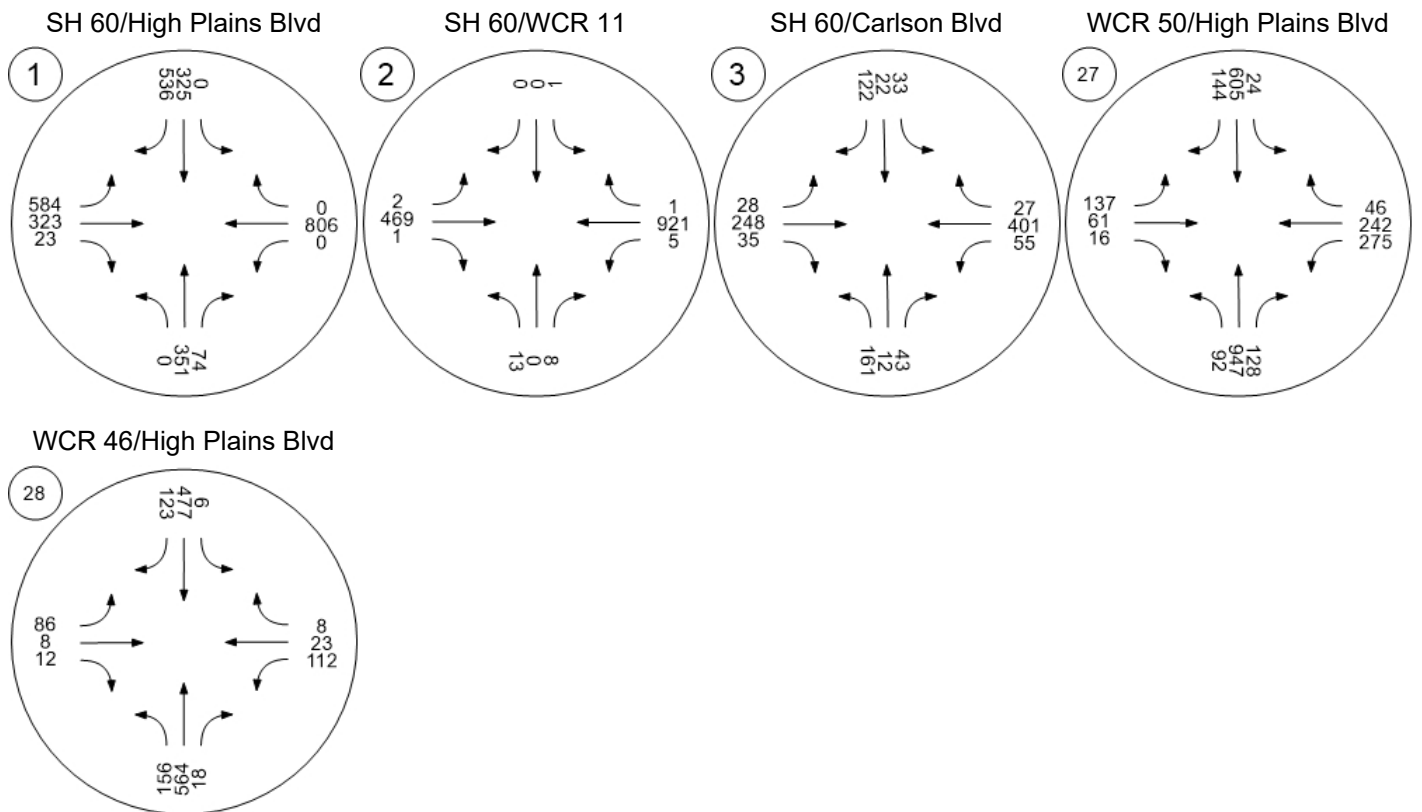
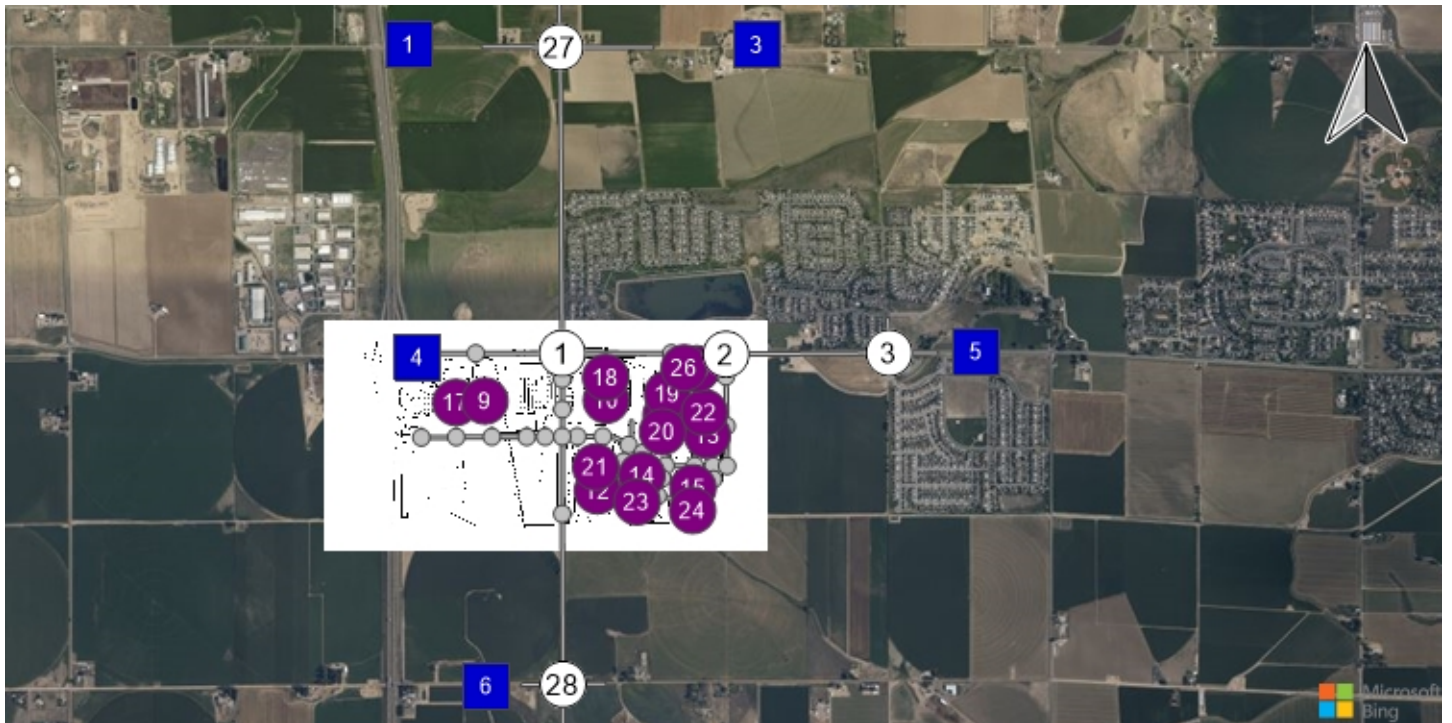


Figure 31 – Year 2041 Total Traffic Volumes – Evening Peak Hour

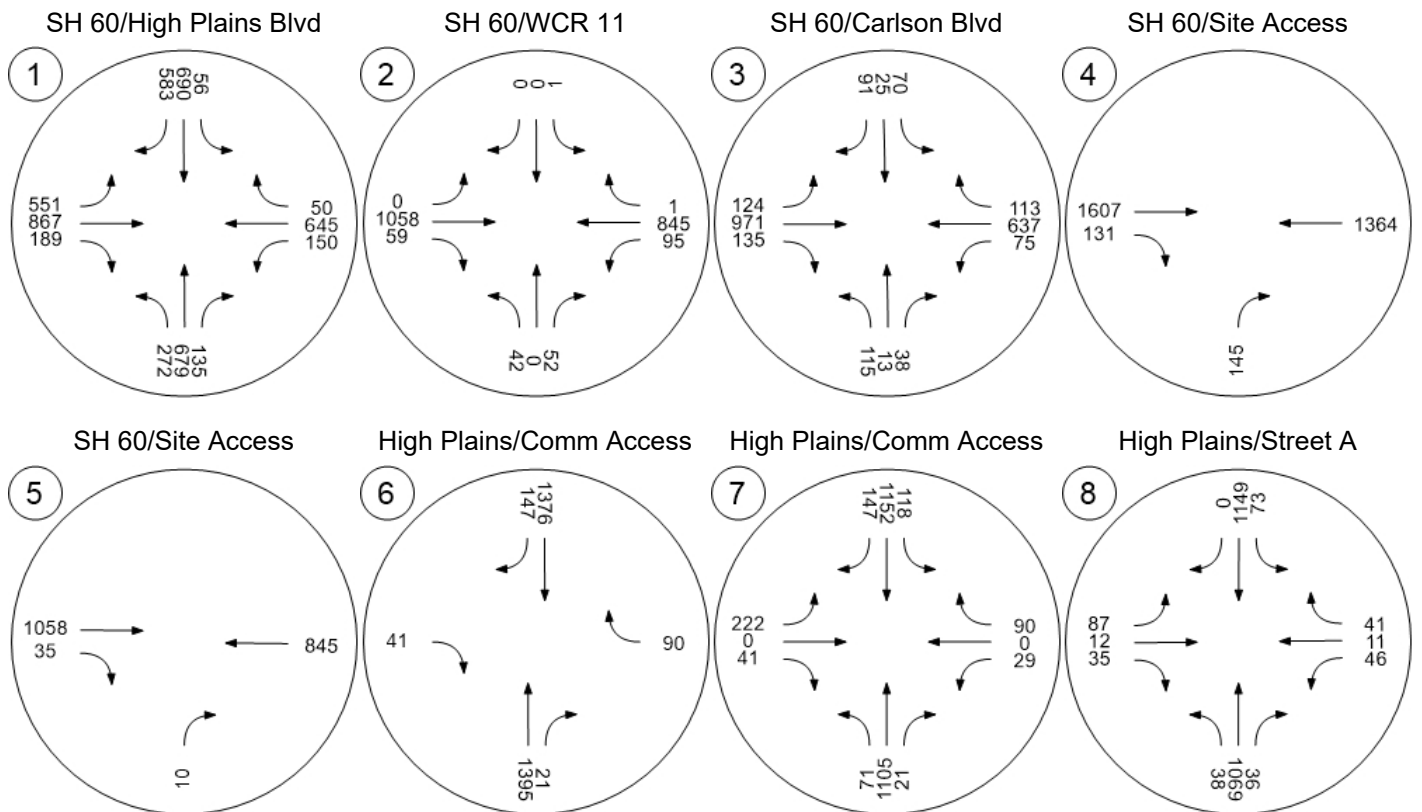


Figure 29 – Year 2041 Background Traffic Volumes – Evening Peak Hour

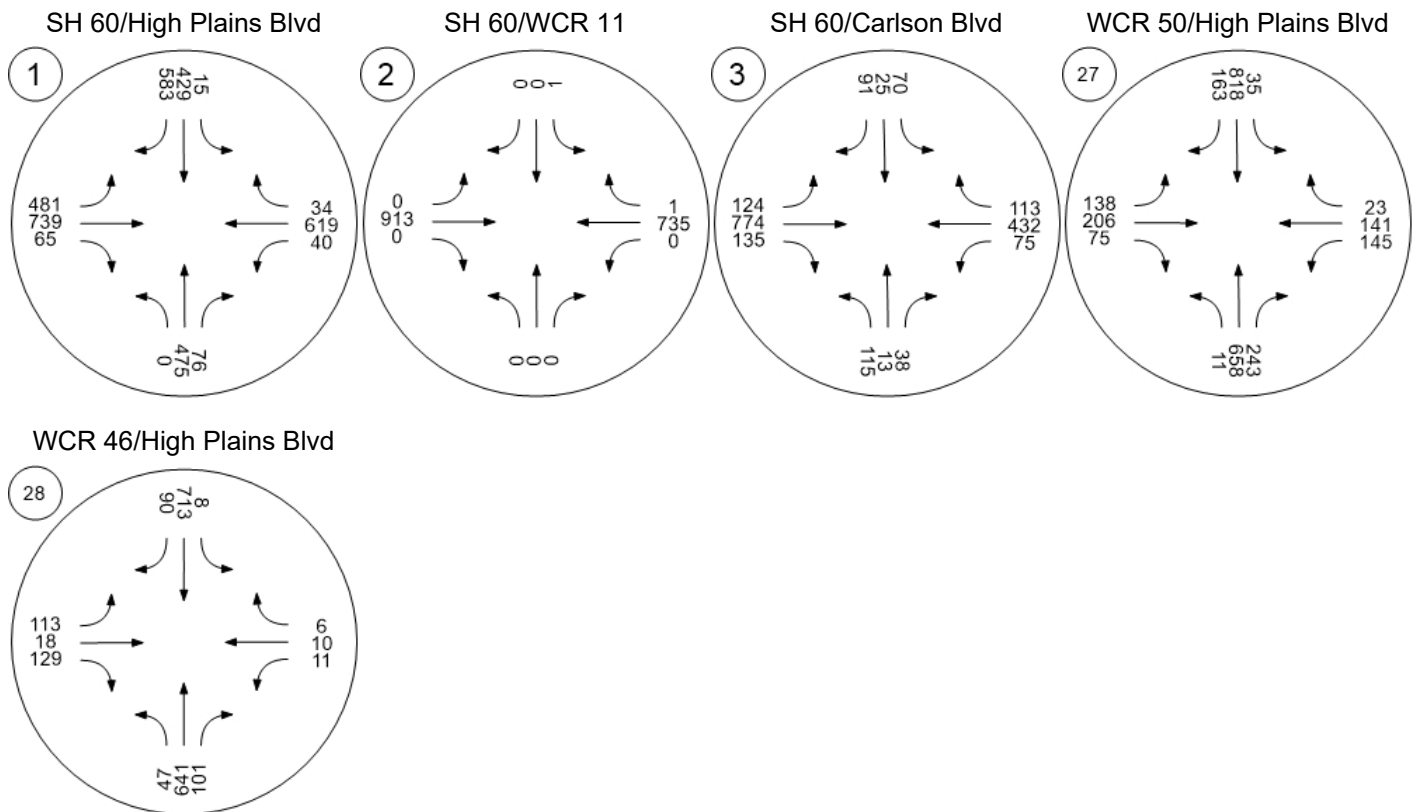
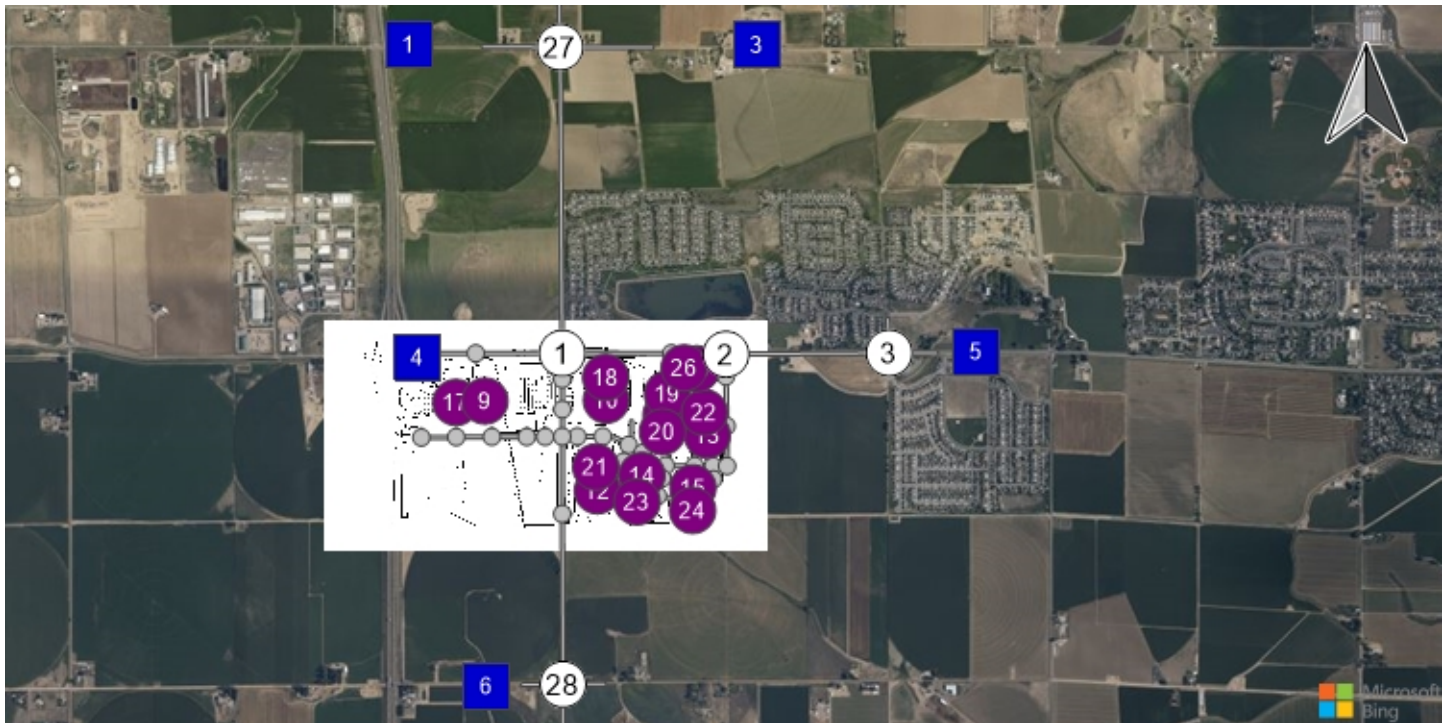


Figure 15 – Long Term Trip Assignment – Evening Peak Hour

