

APPENDIX E
Traffic Impact Analysis

ALDI FOOD MARKET

TRAFFIC IMPACT ANALYSIS



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A handwritten signature in blue ink that reads "Keith R. Rutherford".

March 9, 2016

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SECTION I INTRODUCTION

The purpose of this traffic impact analysis (TIA) is to evaluate potential traffic circulation issues associated with a proposed ALDI Food Market development project and to identify mitigation measures if necessary to meet City of Downey circulation network level of service (LOS) criteria.

The location of the proposed ALDI Food Market Project is shown on Figure 1. The project site is approximately 1.76-acres located at 11215 Lakewood Boulevard, south of Firestone Boulevard in the City of Downey. The project site is currently vacant.

The Project would develop a single-story 18,557 square-foot food market. The proposed project site plan is shown on Figure 2. The project is expected to begin construction in 2016 in a single phase and be completed by the end of 2016. For the purpose of this analysis to estimate ambient growth of traffic volume, the Project completion year is considered to be 2017.



Figure 1
Project Location And Vicinity Map

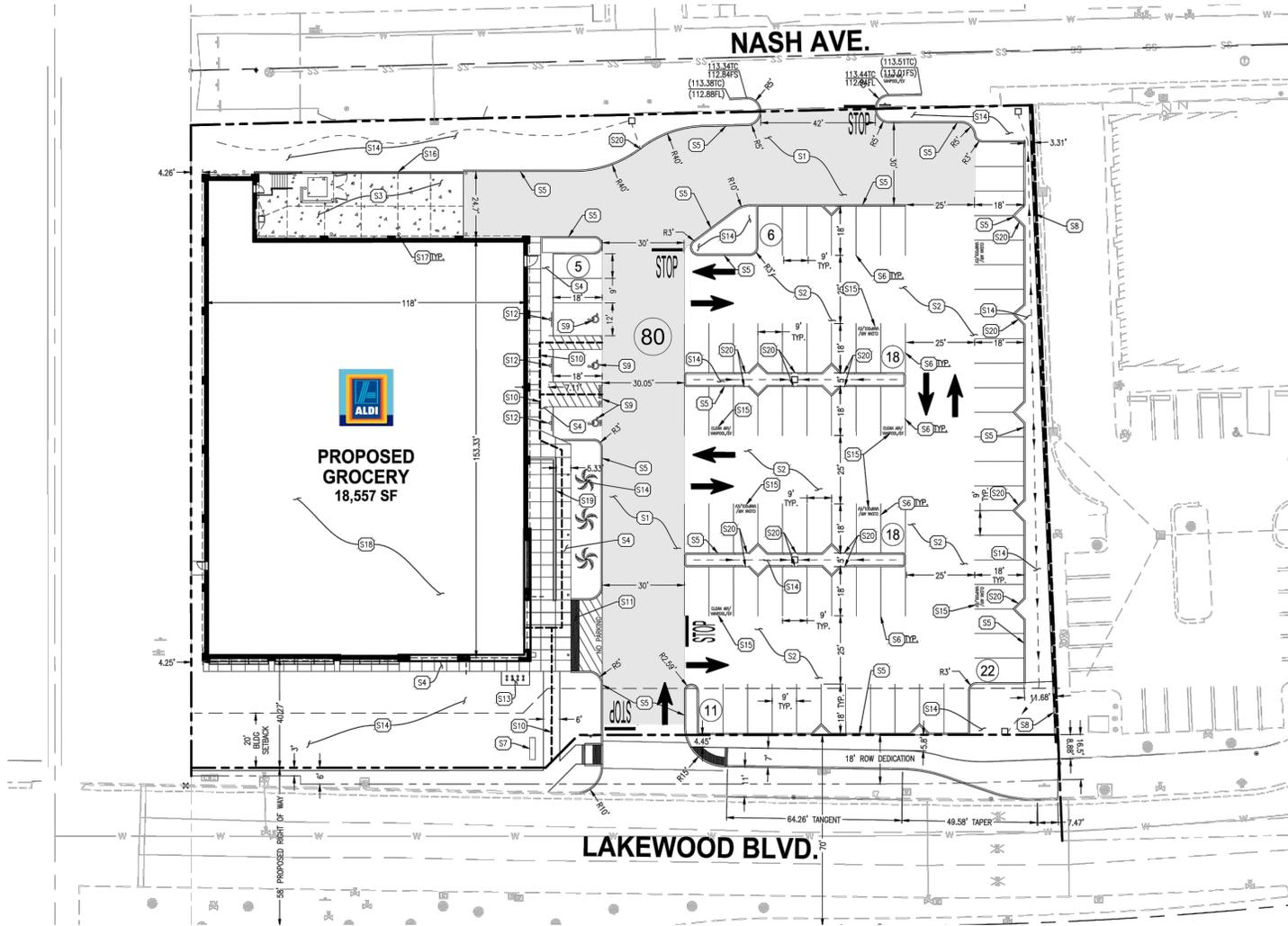


Figure 2
Project Site Plan

SECTION II **EXISTING STUDY AREA CONDITIONS**

Existing Circulation Network

Figure 3 shows the existing roadway network and intersections surrounding the Project site. The following intersections are included in the study area for analysis:

1. Lakewood Boulevard at Firestone Boulevard (signalized); and
2. Lakewood Boulevard at Bellflower Boulevard/Coca Cola Access (signalized).

Figure 3 also shows existing intersection geometrics and controls and the number of through lanes for roadways surrounding the project area. The Project site is in a developed, urban environment surrounded by commercial, retail, office, restaurant, industrial, and single-family residential land uses. The Project site is bordered on the south by Union Pacific Railroad tracks and the Coca Cola Bottling Company plant.

The Project site fronts Lakewood Boulevard on the east and Nash Avenue on the west. Lakewood Boulevard is a Major Arterial roadway per the City General Plan Circulation Element. Lakewood Boulevard is a six-lane divided roadway with a center raised landscaped median and provides three travel lanes in the northbound and southbound directions. On-street parking is prohibited on both sides of the roadway and the posted speed limit is 40 mph. Lakewood Boulevard will provide a right-in-right-out project access at one of the two site driveways. The Project will provide a dedicated southbound right-turn/deceleration lane on Lakewood Boulevard at the access driveway.

Nash Avenue is a local street and will provide project access between the westerly site driveway on Nash and Firestone Boulevard. Nash Avenue has a 30-foot curb-to-curb width with parking allowed on the west side from Firestone Boulevard to the end of the

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street north of the railroad right-of-way. On-street parking is prohibited along the east side of Nash Avenue from McCahill Street to Firestone Boulevard.

Firestone Boulevard is just to the north of the Project site and is designated a Major Arterial roadway per the City General Plan. Firestone Boulevard is a six-lane divided roadway with a center raised median and provides three travel lanes in the eastbound and westbound directions. On-street parking is prohibited on both sides of the roadway and the posted speed limit is 35 mph. The intersection of Firestone Boulevard and Lakewood Boulevard is a County of Los Angeles Congestion Management Plan (CMP) intersection.

Bellflower Boulevard is also located within the project study area to the southeast and intersects with Lakewood Boulevard at the Coca Cola Bottling Company Plant access south of the railroad tracks. Bellflower Boulevard is a north-south designated Secondary Arterial roadway and provides two through lanes in each direction with a painted two-way left-turn lane median and left-turn lanes at intersections. On-street parking is allowed where not prohibited along both sides of the roadway and the posted speed limit is 40 mph.

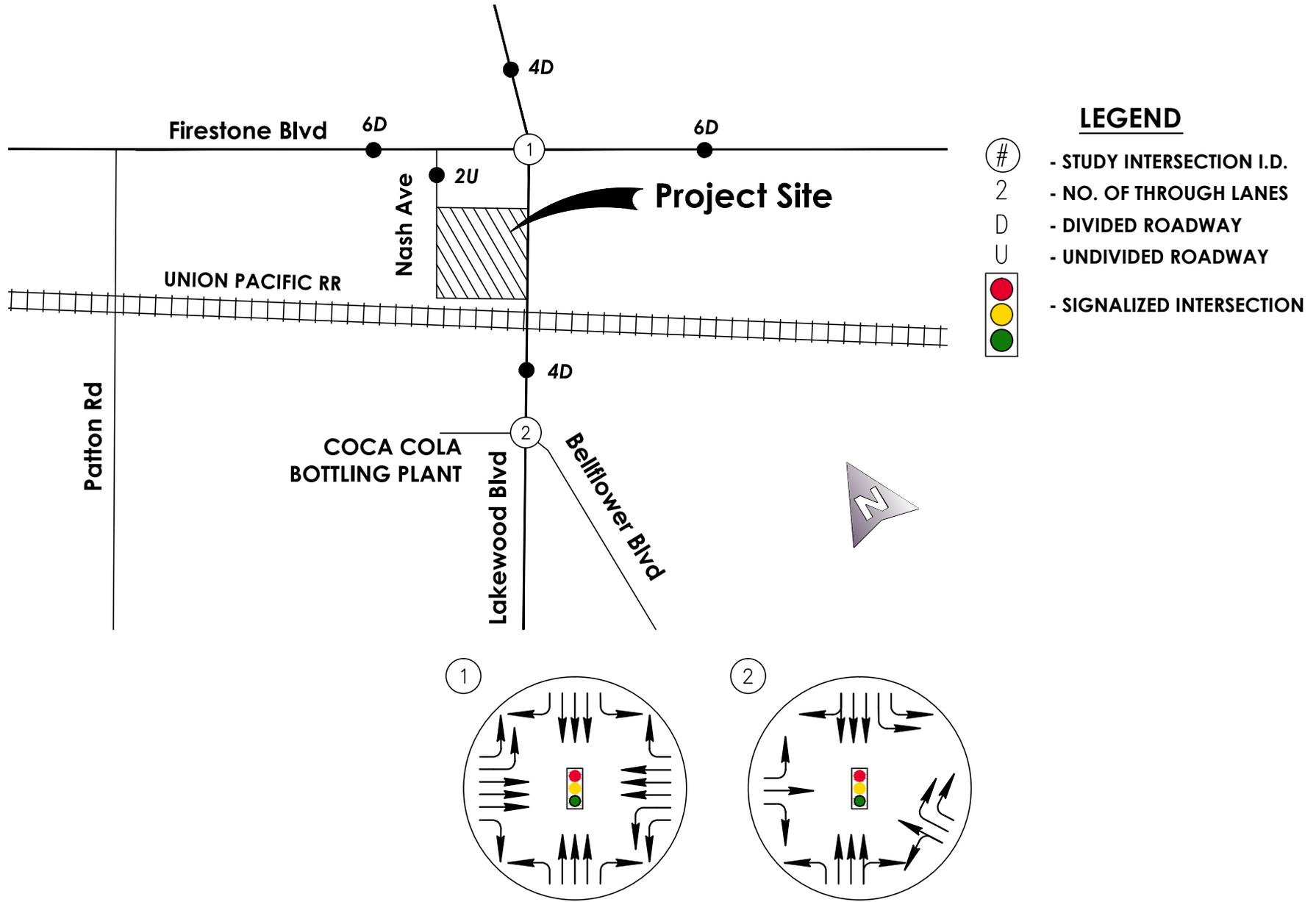


Figure 3
Existing Study Area Intersection Geometrics and Traffic Controls

Existing (2016) and Baseline 2017 Traffic Volumes

Figures 4A and 4B show existing (February 2016) weekday am and pm peak hour intersection turning movement volumes within the project study area, respectively. Figure 5 shows existing weekday 24-hour volumes on roadway segments. Traffic Data was collected on Wednesday and Thursday, February 17 and 18, 2016 for this study by National Data Collection and Surveying Services (NDS) and is included in the appendix.

Intersection turning movement counts for the Firestone Boulevard and Lakewood Boulevard intersection were provided by the City of Downey. These counts were taken on Tuesday and Wednesday, June 2 and 3, 2015 and were also performed by NDS and are included in the appendix. The volumes from these two days were averaged for use in this study. Schools were in regular session when all data used in this study was collected.

The Project is anticipated to be completed in one phase by 2017. Baseline 2017 traffic volumes have been developed by factoring existing 2016 volumes by an ambient growth rate of 1% per year (for 1 year) and then adding traffic from identified future cumulative development projects. Seventeen (17) cumulative development projects were identified for the Project study area. See Section III of this study for a list of development projects whose forecast cumulative traffic volumes have been considered in this study.

Figures 6A and 6B show Baseline 2017 weekday am and pm peak hour intersection turning movement forecasts within the project study area, respectively. The am peak hour volume represents the highest peak hour between 7-9 am and the pm peak hour between 4-6 pm. Figure 7 shows Baseline 2017 weekday 24-hour volumes on roadway segments.

Level of Service Analysis

To provide a detailed analysis of existing peak hour and Baseline 2017 year traffic operation within the study area and to provide a baseline for existing and year 2017 level of service (LOS), signalized intersection LOS was determined using the Intersection Capacity Utilization (ICU) method.

In ICU analysis, the volume of traffic using the intersection is compared to the capacity of the intersection. ICU's are calculated for the peak hours of traffic and include the unique features of the intersection such as turning movement volumes, intersection lane configurations, and traffic signal phasing. ICU is generally expressed as a percent. The percentage represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic and provides a guide to the number and types of lanes required at the intersection. This percentage can also be used to determine a level of service (LOS) based on the utilized capacity of the intersection. All parameters used in this study for ICU analysis are consistent with Los Angeles County guidelines.

Table 1 provides ICU level of service ranges and descriptions for signalized intersections. In the City of Downey, an acceptable level of service (LOS) for peak hour intersection operations is LOS A, B, C, or D according to the General Plan. In addition to the General Plan, the standards and requirements of the Los Angeles County Congestion Management Plan (CMP) provide the basis for evaluating the potential for project traffic impacts within the City. For purposes of the CMP, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by 2% of capacity ($v/c \geq 0.02$), causing LOS F ($v/c > 1.00$); if the facility is already LOS F, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by 2% of capacity ($v/c \geq 0.02$). The Lakewood Boulevard/Firestone Boulevard intersection included in this analysis is currently identified on the County CMP but does not meet this criteria for either existing or future no project or with project conditions.

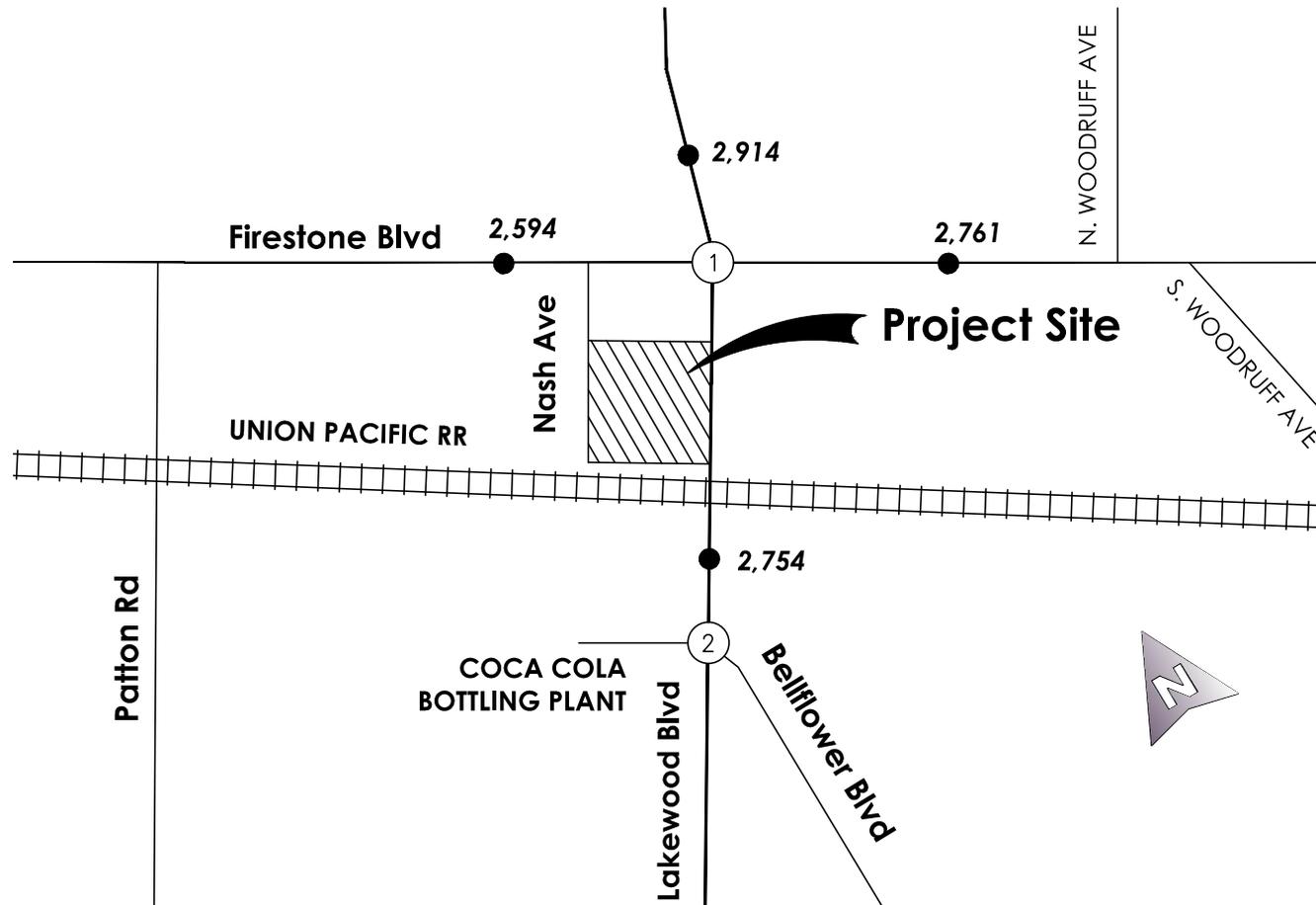
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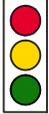
Table 2 shows the results of intersection level of service analysis for the study area intersections under existing 2016 conditions and Table 3 for Baseline 2017 conditions. Table 2 shows that the Lakewood/Firestone intersection is currently operating at Level of Service C during both the am and pm peak hours and the Lakewood/Bellflower intersection is operating at LOS A during both peak hours with existing 2016 traffic volumes and improvements.

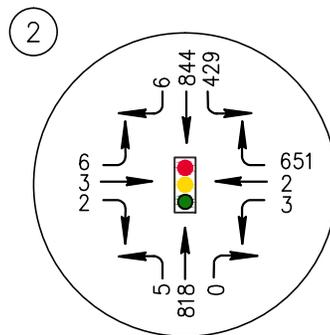
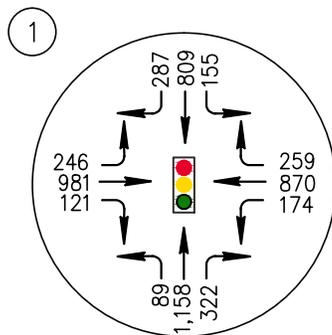
Table 3 shows that study area intersection LOS for Baseline 2017 conditions is the same as existing 2015 conditions with one exception. At Firestone Boulevard/Lakewood Boulevard forecast level of service is expected to decline from existing LOS C to LOS D in the pm peak hour. This is due to the traffic volume generated by the relatively large number (16) of cumulative development projects that were identified and have been included in this study. Am peak hour LOS at Firestone Boulevard/Lakewood Boulevard and Lakewood Boulevard/Bellflower Boulevard for both peak hours remains the same as for existing 2016 conditions. The Baseline 2017 study area intersection and roadway configurations are considered to be the same as the existing (2016) network.

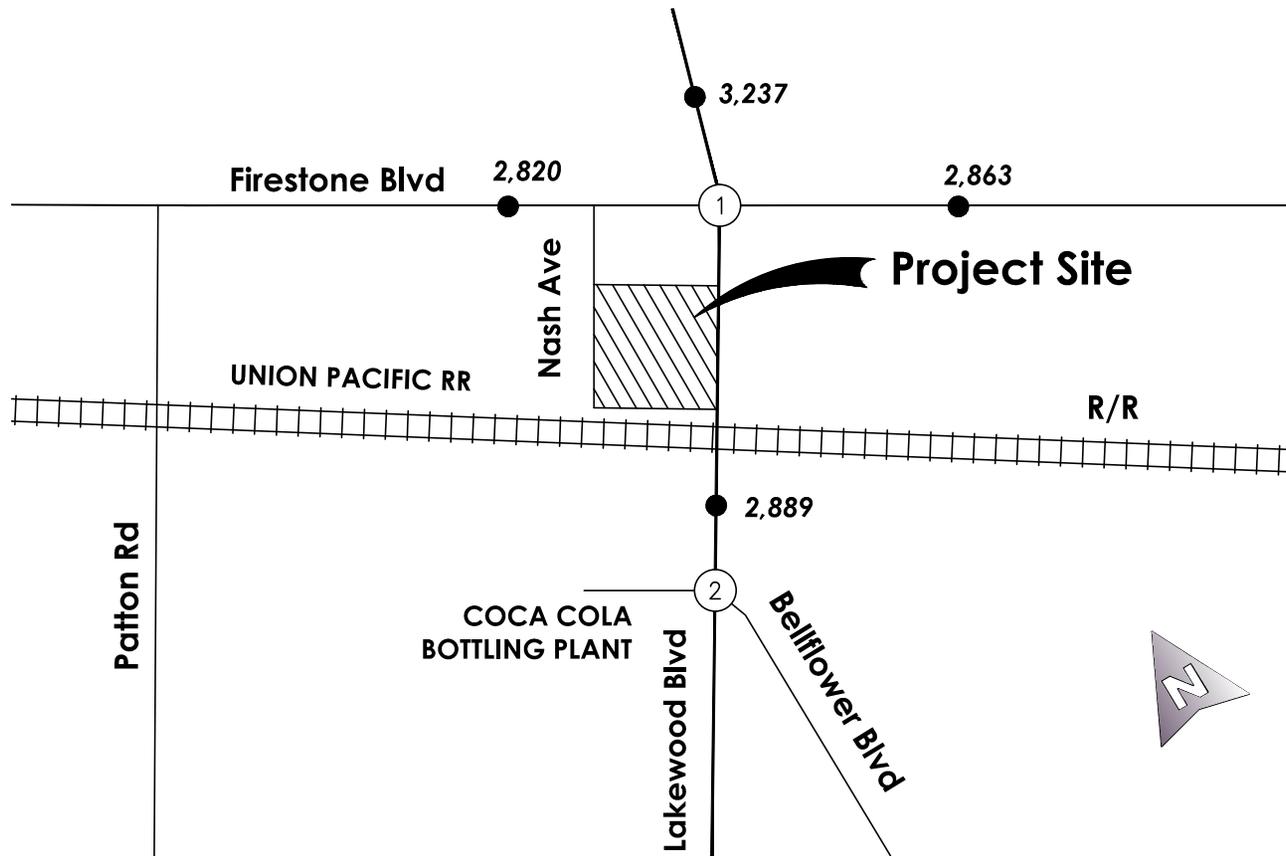
Figure 5 shows the existing weekday 24-hour traffic volumes on Firestone Boulevard are approximately 37,000 and 43,000 vehicles per day to the east and west of Lakewood Boulevard, respectively. These volumes are below capacity of this roadway (approximately 54,000 vehicles per day). The existing weekday 24-hour volumes along Lakewood Boulevard south of Firestone Boulevard are approximately 39,000 and are also below the capacity of this roadway (approximately 54,000 vehicles per day). The weekday 24-hour volume on Bellflower Boulevard is approximately 12,000 vehicles per day, below an estimated capacity of approximately 36,000 vehicles per day for this roadway.

Figure 7 shows that Baseline 2017 weekday 24-hour volumes on the roadways surrounding the project are forecast to remain below capacity but with higher volumes due to the traffic generated by cumulative projects.

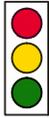


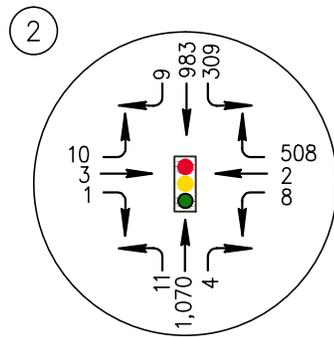
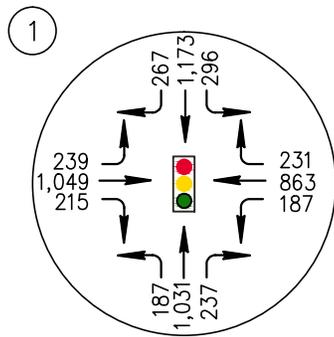
- LEGEND**
- # - Study Intersection I.D.
 - 2,594 - Two-way roadway link volume
 -  - Signalized Intersection

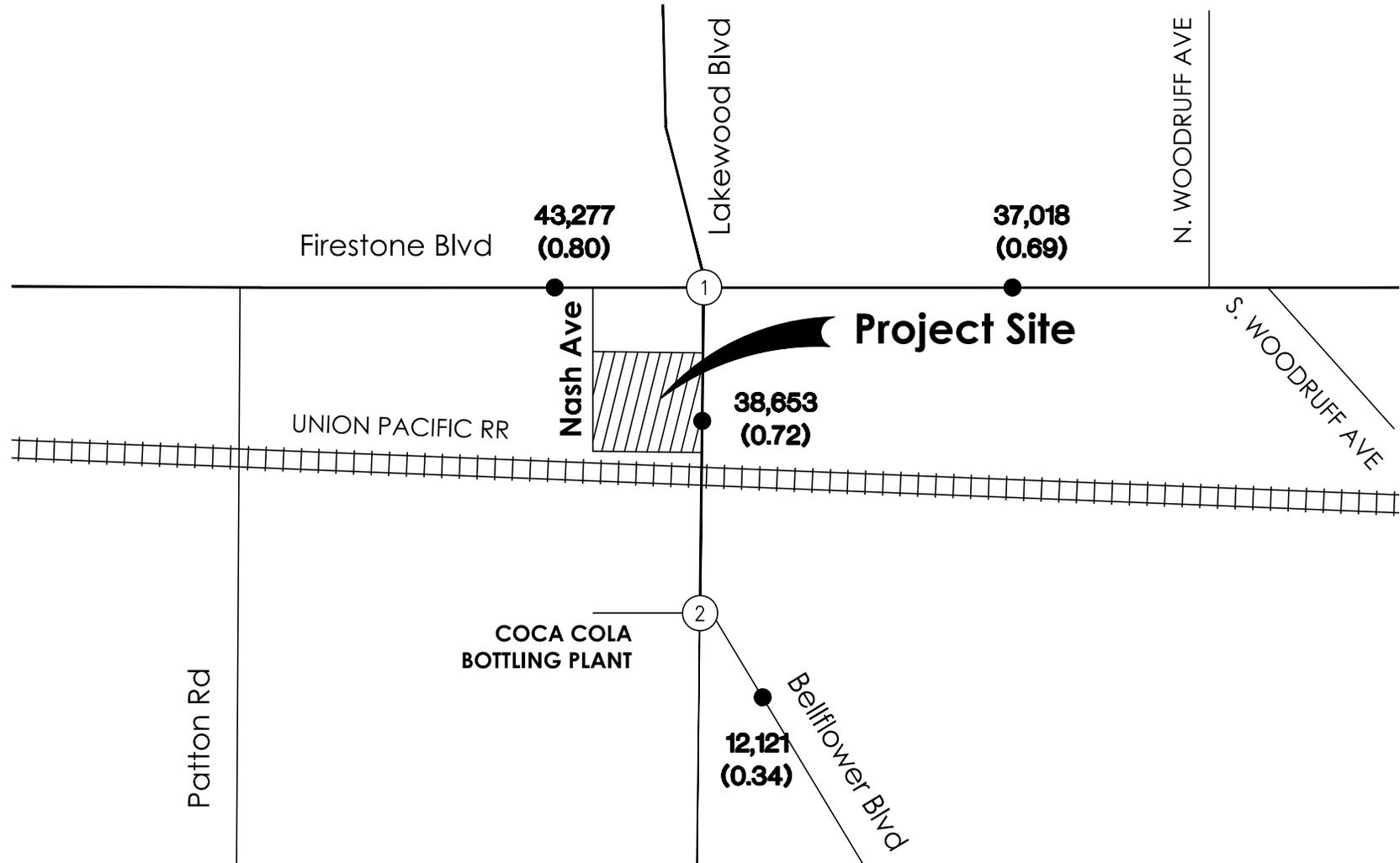




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- Ⓝ - Study Intersection I.D.
- 2,820 - Two-way roadway link volume
-  - Signalized Intersection





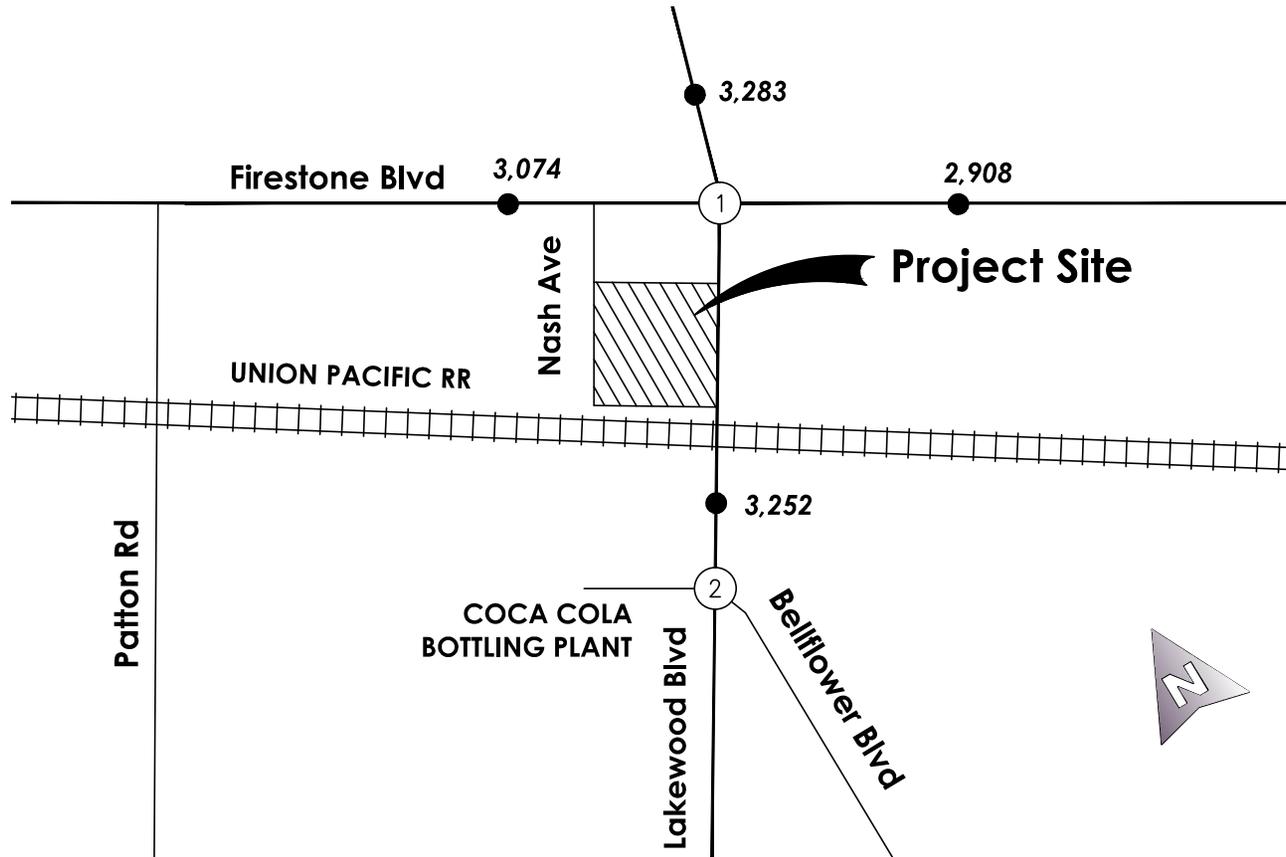
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- # - Study Intersection ID No.
- 12,121 - Weekday 24-hr Roadway Traffic Volume
- (0.34) - Volume to Capacity Ratio

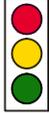


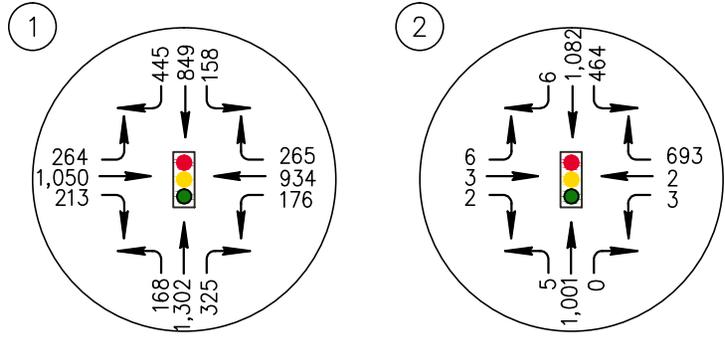
Figure 5
Existing Weekday 24-Hour Roadway Volumes and V/C Ratios

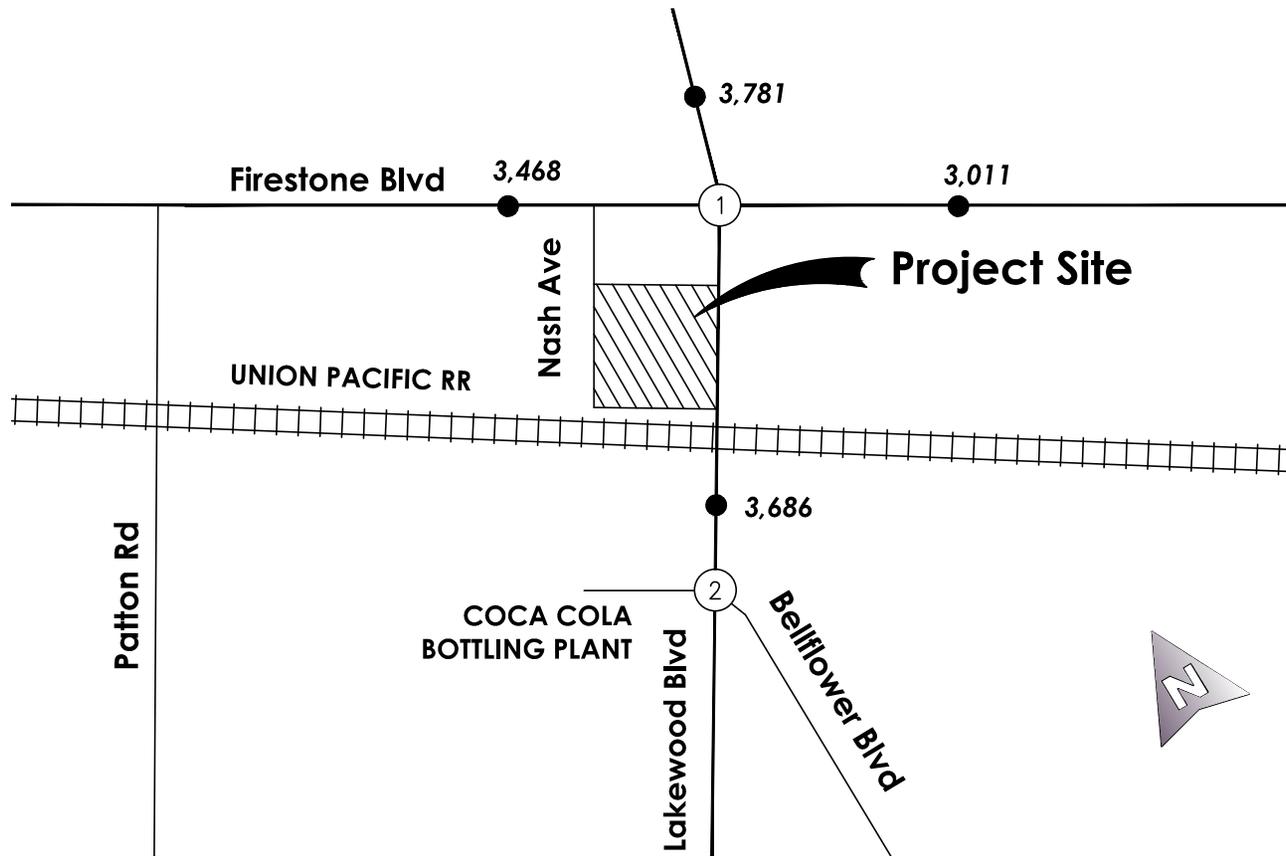
v:\2073\active\2073010140\drawing\exhibit_files\Fig. 5 - existing daily link vol and v/c ratios.dwg



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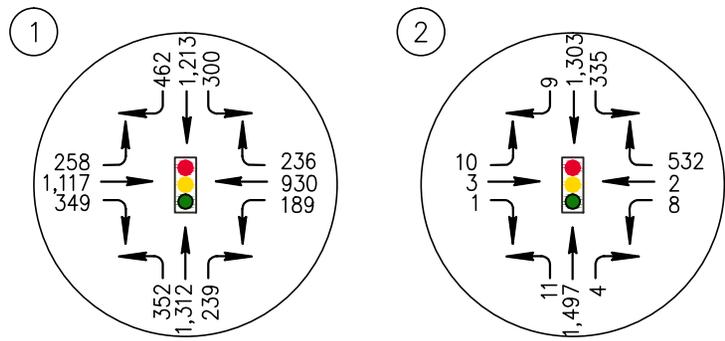
- ① - Study Intersection I.D.
- 2,908 - Two-way roadway link volume
-  - Signalized Intersection

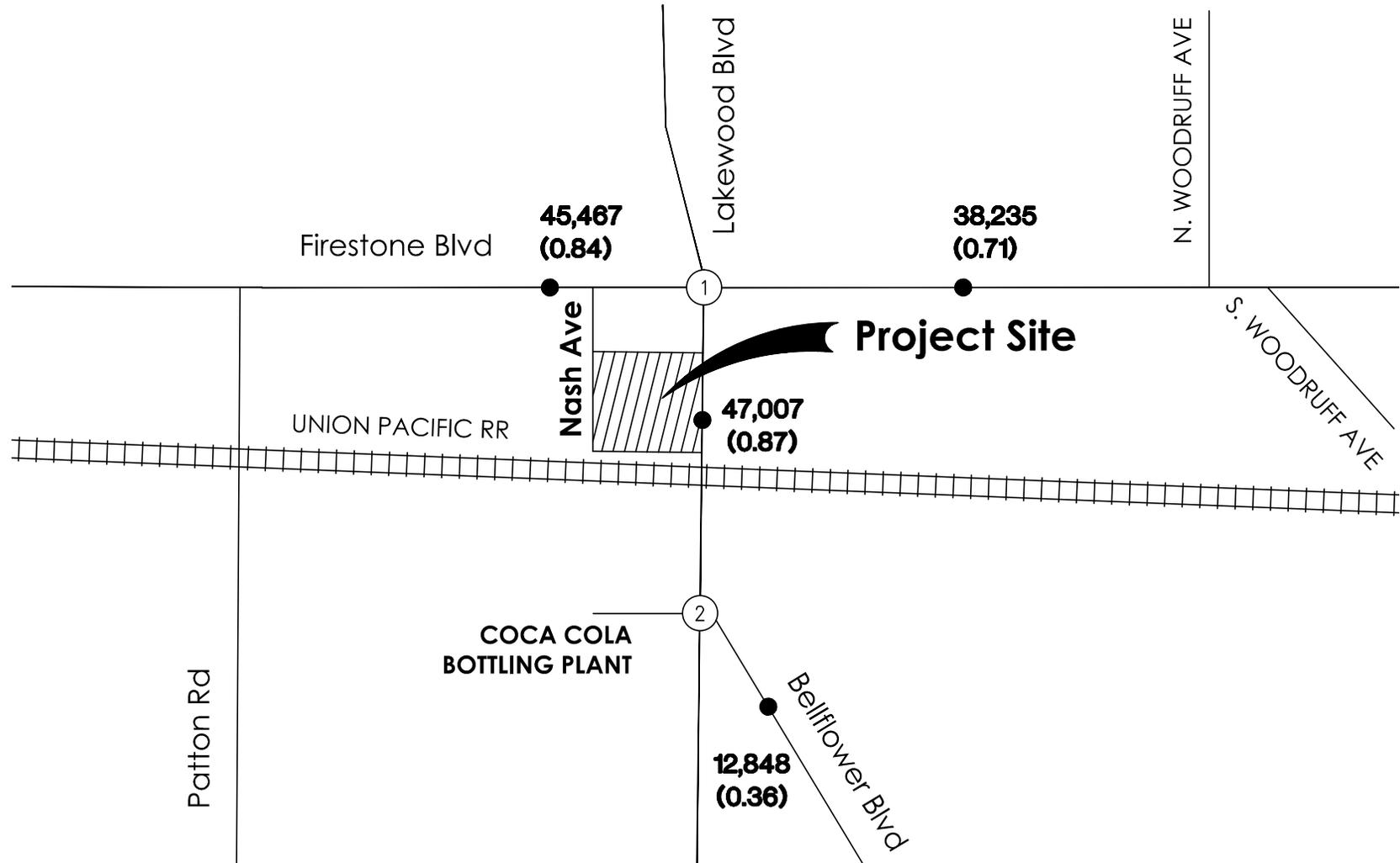




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- # - Study Intersection I.D.
- 3,468 - Two-way roadway link volume
- Signalized Intersection





LEGEND



- Study Intersection ID No.

12,848 - Weekday 24-hr Roadway Traffic Volume

(0.36) - Volume to Capacity Ratio





**TABLE 1
INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS
LEVEL OF SERVICE DESCRIPTIONS**

Level of Service	Traffic Flow Description	Nominal Range of ICU
A	Low volumes; high speeds; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.	0.00 - 0.60
B	Operating speeds beginning to be affected by other traffic; between one and ten percent of the signal cycles have one or more vehicles which wait through more than one cycle during peak traffic periods.	0.61 - 0.70
C	Operating speeds and maneuverability closely controlled by other traffic; between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one cycle during peak traffic periods; recommended ideal design standard.	0.71 - 0.80
D	Tolerable operating speeds; 31 to 70 percent of the signal cycles have one or more vehicles which wait through more than one cycle during peak traffic periods; often used as design standard in urban areas.	0.81 - 0.90
E	Capacity; the maximum traffic volume an intersection can accommodate; restricted speeds; 71 to 100 percent of the signal cycles have one or more vehicles which wait through more than one cycle during peak traffic periods.	0.91 - 1.00
F	Long queues of traffic; unstable flow; stoppages of long duration; traffic volumes and traffic speed can drop to zero; traffic volumes will be less than the volume which occurs at Level of Service E.	over 1.00

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TABLE 2
Existing (2016) Level of Service at Study Area Intersections

Signalized Intersections	Existing (2016)			
	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
1. Lakewood Boulevard / Firestone Boulevard	0.71	C	0.78	C
2. Lakewood Boulevard / Bellflower Boulevard	0.47	A	0.49	A

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TABLE 3
Baseline (2017) Level of Service at Study Area Intersections

Signalized Intersections	Existing (2015)				Baseline (2017)			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
1. Lakewood Boulevard / Firestone Boulevard	0.71	C	0.78	C	0.75	C	0.87	D
2. Lakewood Boulevard / Bellflower Boulevard	0.47	A	0.49	A	0.53	A	0.59	A

SECTION III **PROJECTED FUTURE TRAFFIC**

Trip Generation

Trip generation rates and forecast project daily and peak hour traffic volumes are shown on Table 4. The trip generation rates used to forecast traffic volumes produced by the project are identified by the Institute of Transportation Engineers, in *Trip Generation*, 9th Edition.

The proposed project is to be implemented in a single phase by 2017. Baseline 2017 traffic volumes have been developed by factoring existing 2016 volumes by an ambient growth rate of 1% per year and then adding traffic from identified future development projects. The identified projects whose cumulative traffic volumes have been considered in this analysis include:

1. Promenade at Downey (1.5 million square feet), 12214 Lakewood Boulevard, Downey;
2. Champion Dodge (Additional 11,000 square feet), 9655 Firestone Boulevard, Downey;
3. La Barca Restaurant (13,710 square feet), 8649 Firestone Boulevard, Downey;
4. Shree Swaminarayan Temple (Additional 9,653 square feet), 12147-12157 Lakewood Boulevard, Downey;
5. Senior Housing Development of 55 dwelling units, 12900 Woodruff Avenue, Downey;
6. DaVita Dialysis (Additional 960 square feet), 11610 Lakewood Boulevard, Downey;
7. The Commons (18,000 square feet of restaurant uses), 9516 Lakewood Bl., Downey;
8. Downey Crossroads (16,000 square feet Planet Fitness, 12,000 square feet of retail, 3,000 square feet Taco Bell drive-thru), 9515 Lakewood Bl., Downey;
9. Centerpointe (117 3-story townhomes), 10720 Paramount Boulevard, Downey;

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-
10. Starbucks (800 square feet w/patio and drive-thru), 9506 Imperial Hwy, Downey;
 11. Fontana Townhomes (eight 2-story units), 8435 Fontana, Downey;
 12. Western Townhomes (eight 3-story units), 10345 Western Avenue, Downey;
 13. Habitat for Humanity (six 2-story units), 9303 Elm Vista Drive, Downey;
 14. Downtown Housing (28 dwelling units), 8150 3rd Street, Downey;
 15. Jack-in-the-Box (2,510 square feet restaurant and drive-thru), 9511 Firestone Bl., Downey;
 16. Valvoline Instant Oil Change (5,061 square feet – 4 service bays) 7737 Firestone Bl., Downey; and
 17. Nissan Auto Dealership (6.57 acres), 7231 Firestone Boulevard, Downey.

Trip Distribution and Assignment

Figure 8 shows the distribution and assignment for traffic generated by the project. This figure shows that 20% of project traffic is assigned to/from the east and 30% to/from the west via Firestone Boulevard. Fifteen percent (15%) each is assigned to/from the south/southeast via Lakewood Boulevard and Bellflower Boulevard. Twenty percent (20%) is assigned to/from the north via Lakewood Boulevard.

Figure 8 also shows the percentage of project traffic by turning movement at each of the access driveways.

Project Peak Hour Intersection Turning Movement and Weekday Daily Traffic Volumes

The combination of project trip generation and project trip distribution/assignment results in the Project traffic volumes shown on Figures 9A and 9B for am and pm peak hours, respectively. These figures show the project peak hour turning movement volumes at study area intersections and the total (two-way) project peak hour volumes on roadway links between intersections. Figure 10 shows Project weekday daily 24-hour traffic volumes.

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Existing (2016) with Project Traffic Volumes

Existing 2016 and project traffic volumes have been combined to produce forecasts of existing traffic conditions with Project implementation. Figures 11A and 11B show Existing 2016 with Project traffic volumes for am and pm peak hours, respectively. Figure 12 shows Existing 2016 with Project weekday daily 24-hour traffic volumes.

Baseline 2017 with Project Traffic Volumes

Baseline 2017 and project traffic volumes have been combined to produce forecasts of future traffic conditions with Project implementation. Figures 13A and 13B show Baseline 2017 with Project traffic volumes for am and pm peak hours, respectively. Figure 14 shows Baseline 2017 with Project weekday daily 24-hour traffic volumes.



TABLE 4
Aldi Food Market - Trip Generation Summary

Trip Generation Rates**

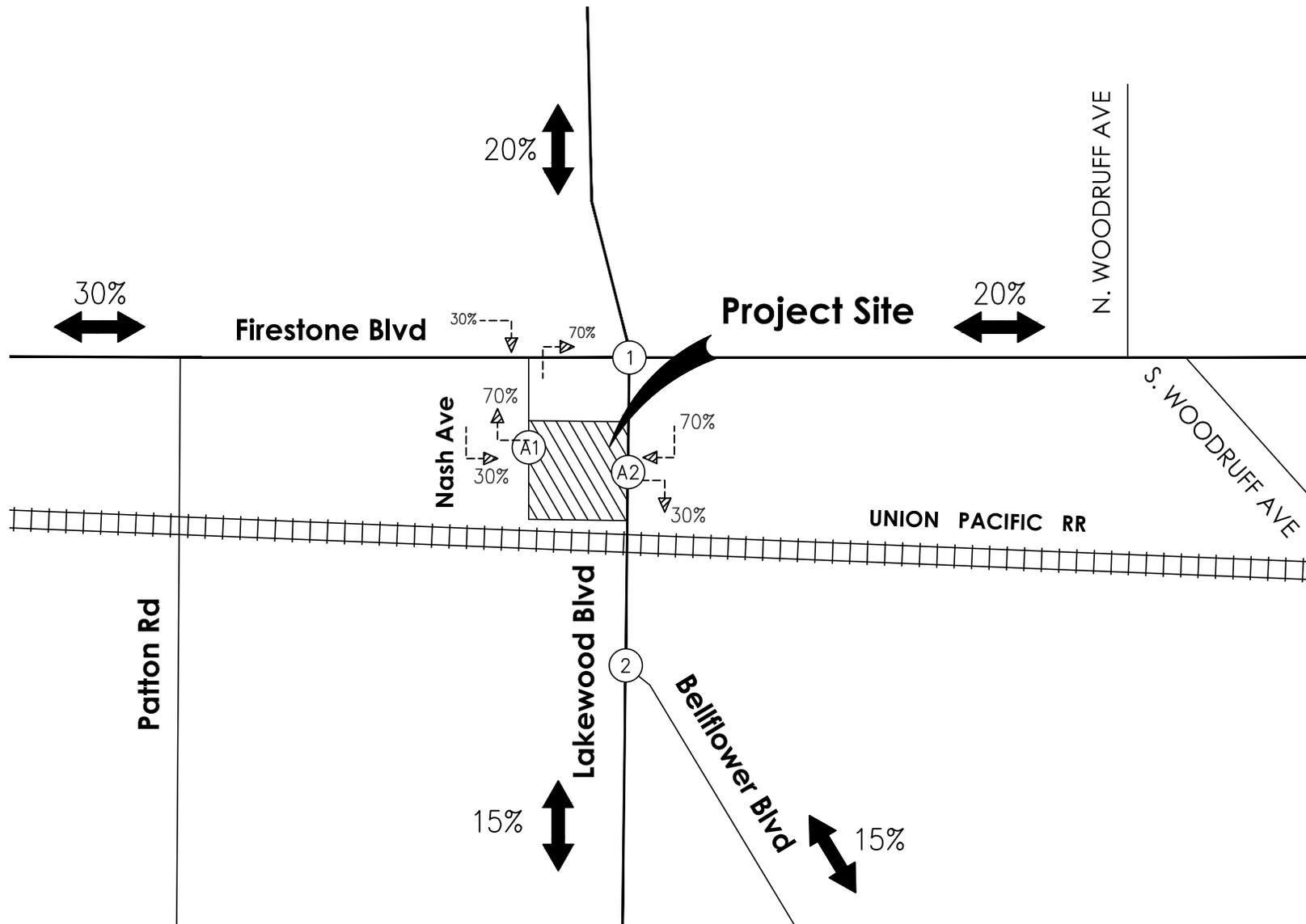
<u>Land Use</u>	<u>Unit</u>	<u>ITE Land Code</u>	<u>Quantity</u>	<u>Daily Rate</u>	<u>AM Peak Hour Split</u>			<u>PM Peak Hour Split</u>		
					<u>Rate</u>	<u>In</u>	<u>Out</u>	<u>Rate</u>	<u>In</u>	<u>Out</u>
1. Supermarket	SF	850	18,557	102.24	3.40	62%	38%	9.48	51%	49%
Fitted Curve Equation: Supermarket			Daily		AM Peak			PM Peak		
			T=66.95(X)+1391.56		N/A			Ln(T)=0.74Ln(X)+3.25		

Project Trip Generation

<u>Land Use</u>	<u>Quantity</u>	<u>ADT*</u>	<u>AM Peak Hour Volume</u>			<u>PM Peak Hour Volume</u>		
			<u>Total</u>	<u>In</u>	<u>Out</u>	<u>Total*</u>	<u>In</u>	<u>Out</u>
1. Supermarket	18,557	2,634	63	39	24	224	114	110
Total		2,634	63	39	24	224	114	110

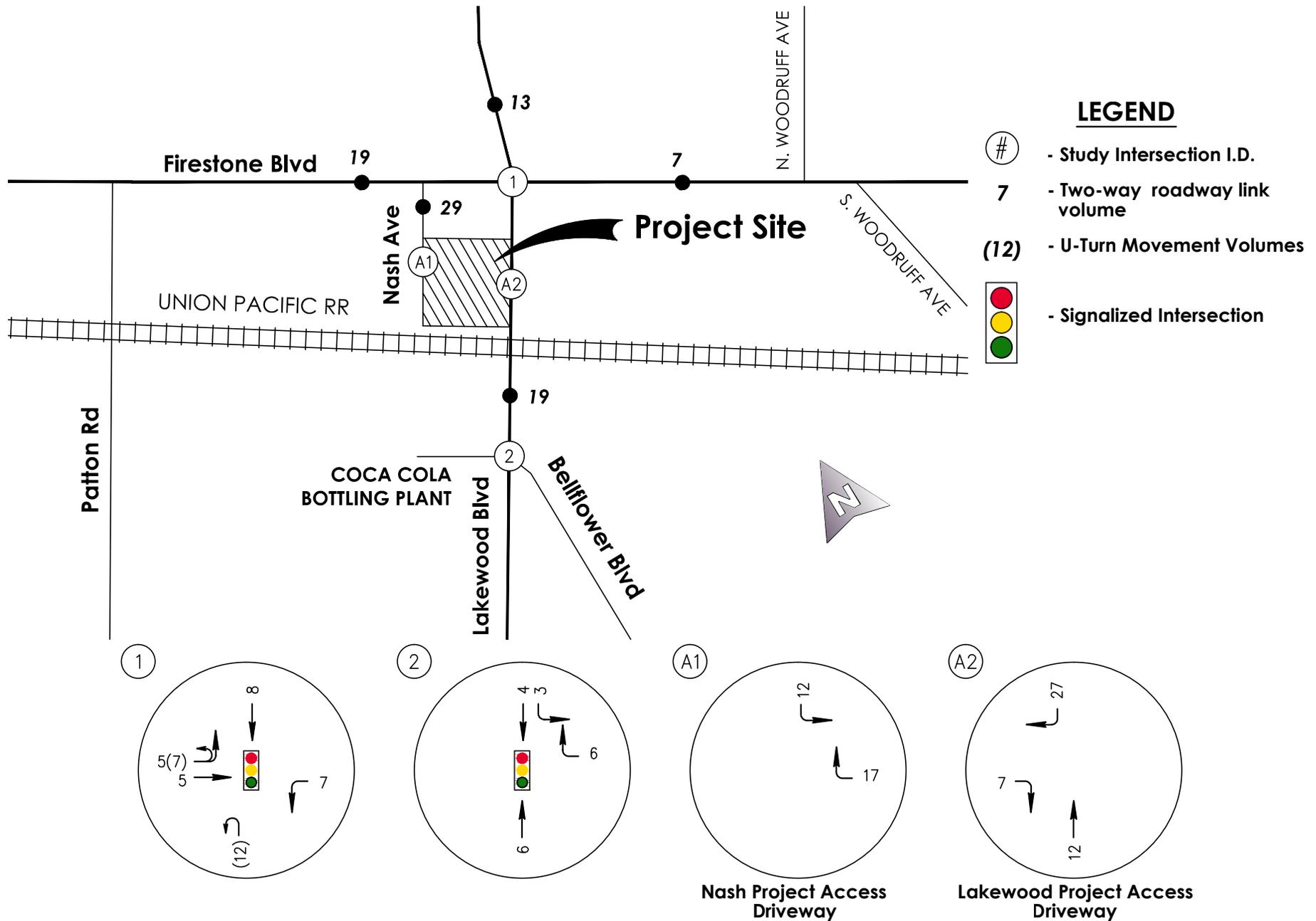
* Fitted Curve Equation used to Estimate Trips Generated

** Source: ITE Trip Generation Manual, 9th Edition



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Figure 8
Project Trip Distribution



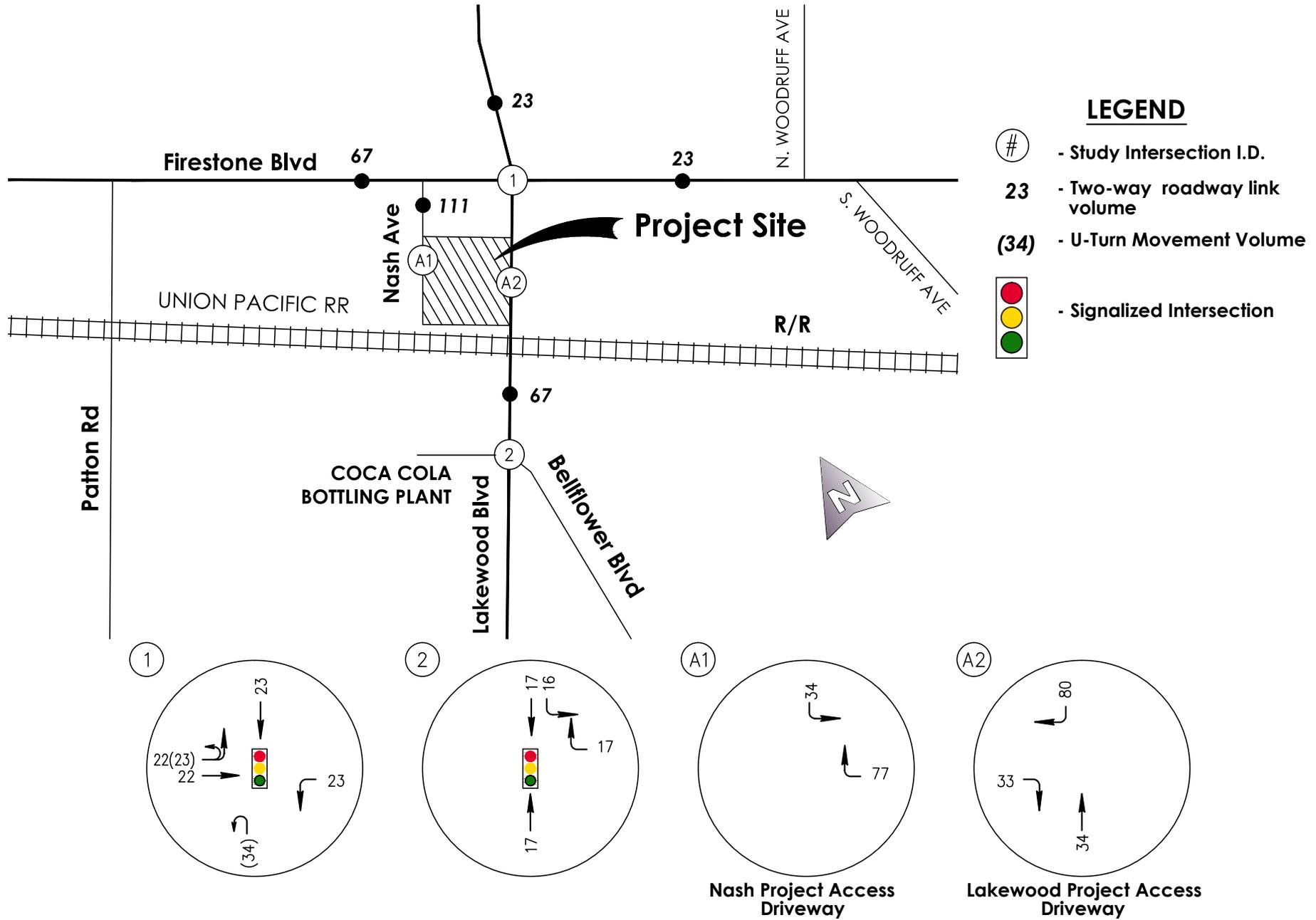
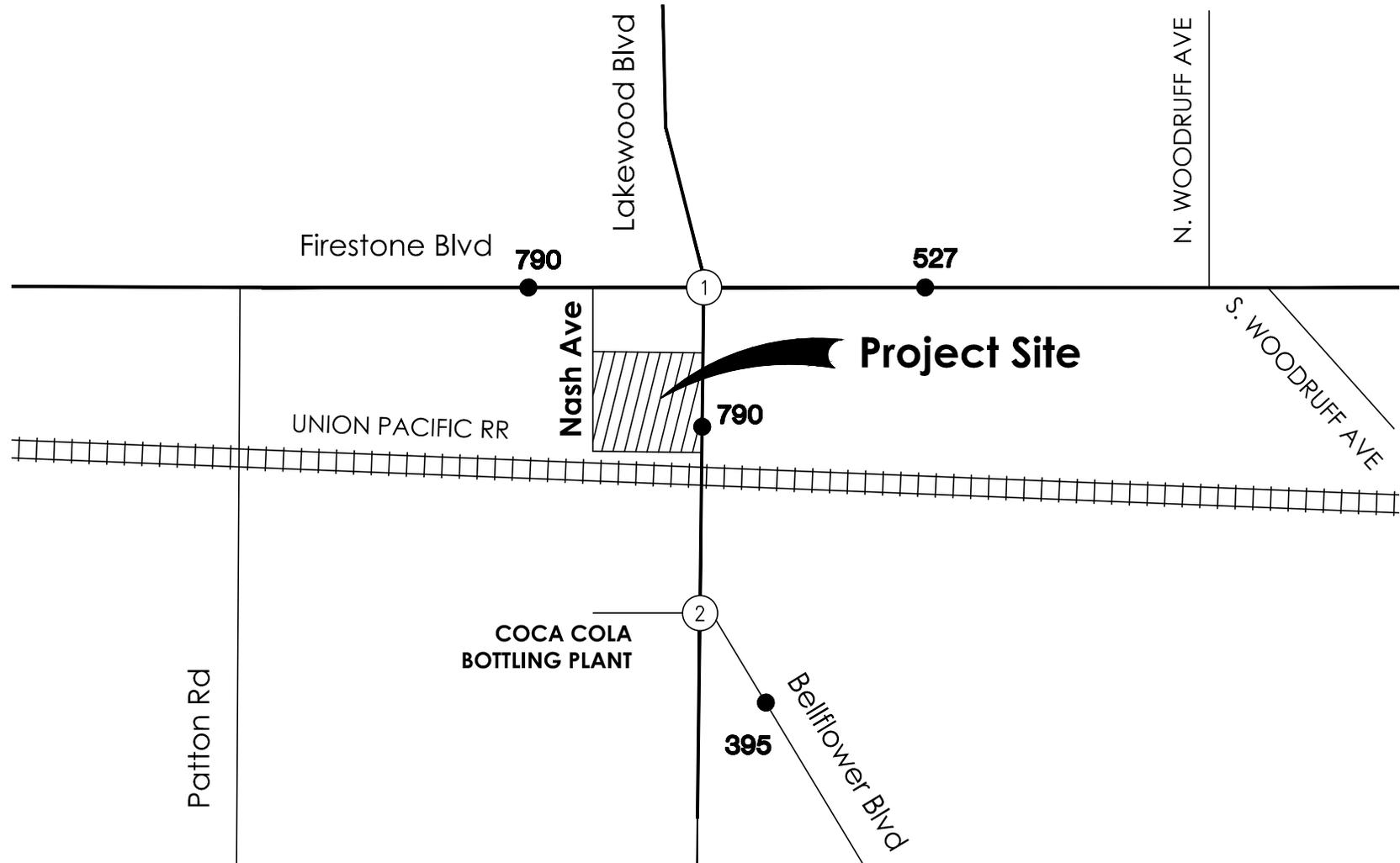


Figure 9B
Project Only PM Peak Hour Turning Movement and Roadway Link Volumes



LEGEND



- Study Intersection ID No.

395 - Weekday 24-hr Roadway Traffic Volume



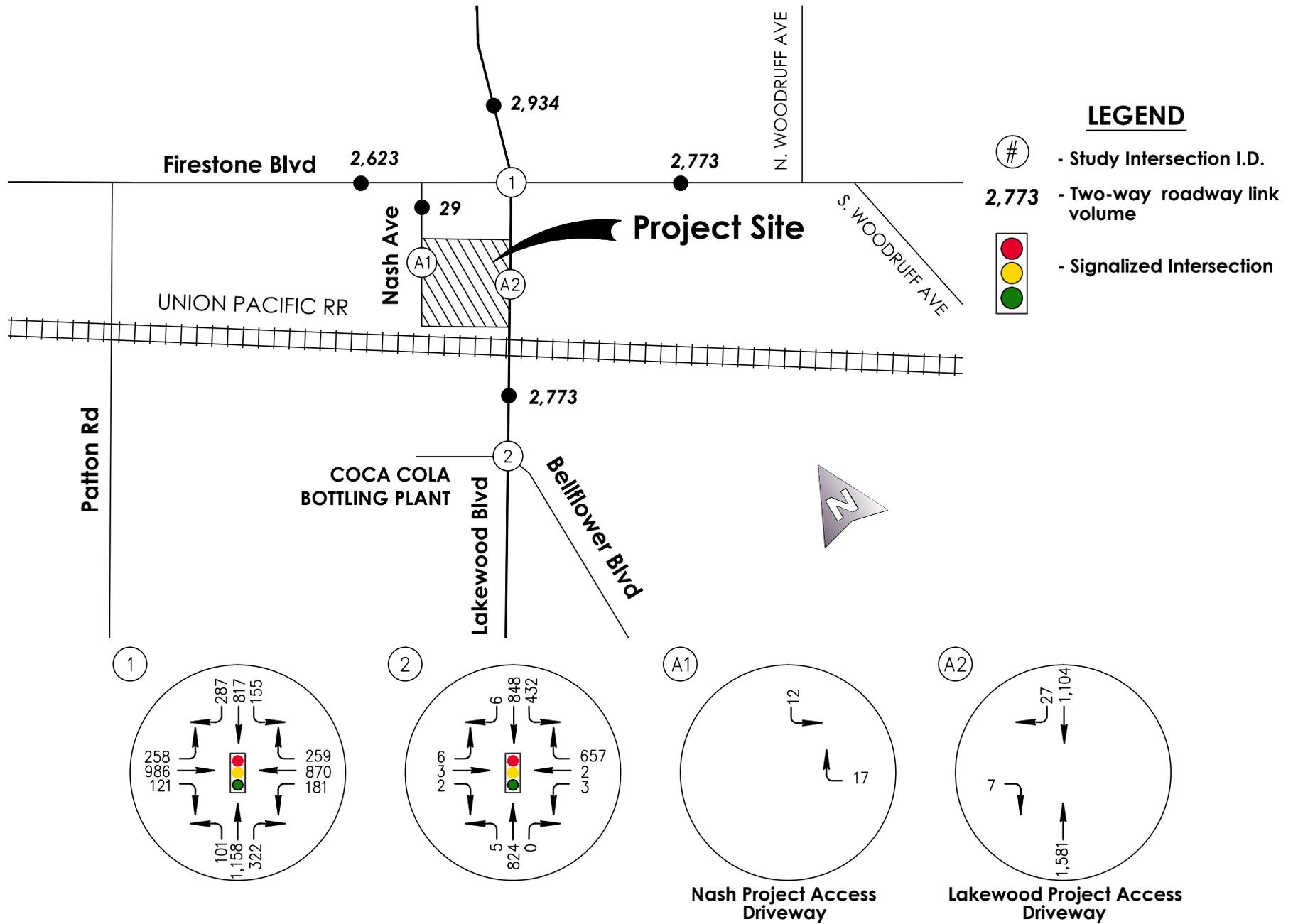


Figure 11A
Existing with Project AM Peak Hour Turning Movement and Roadway Link Volumes

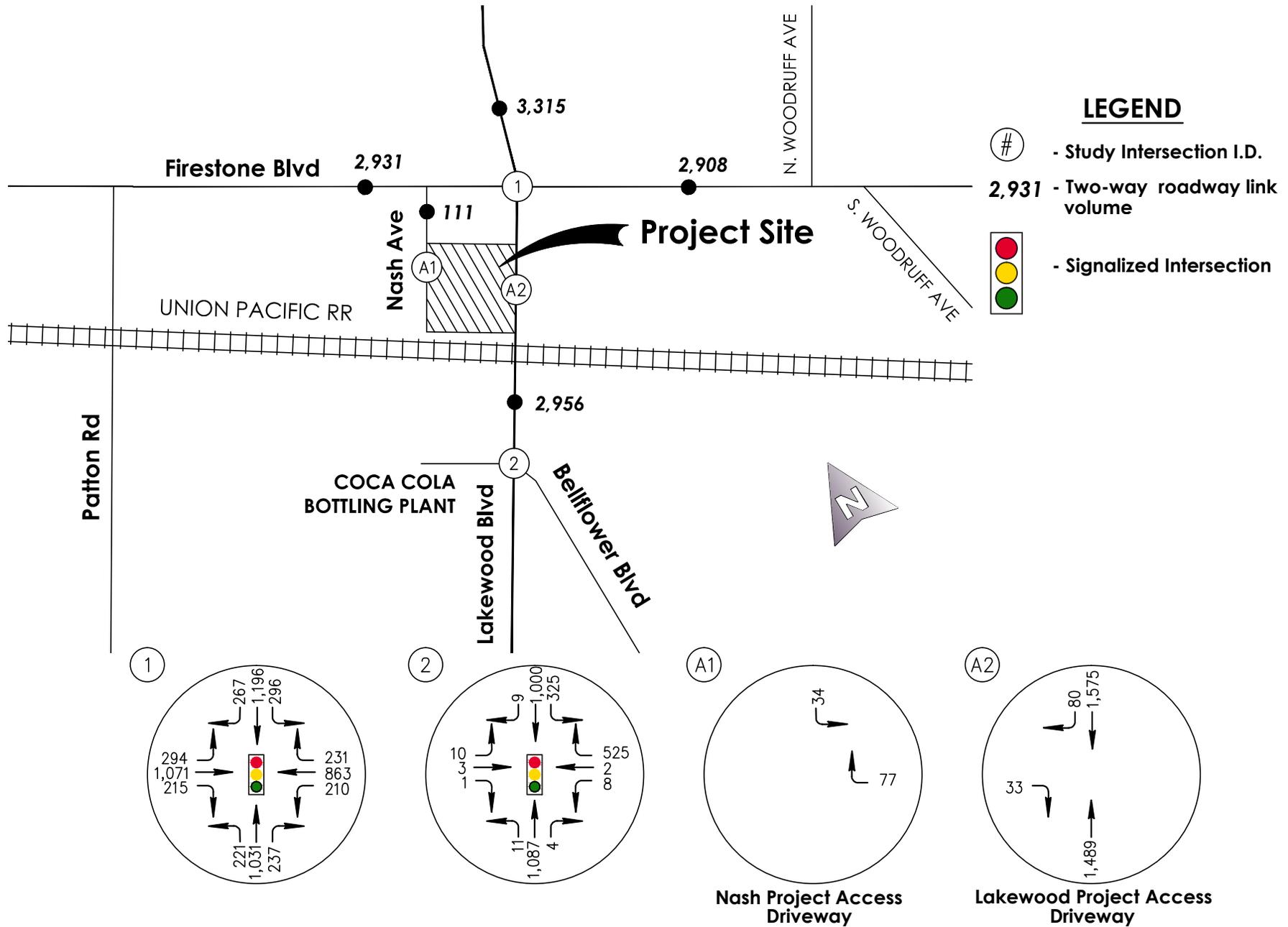
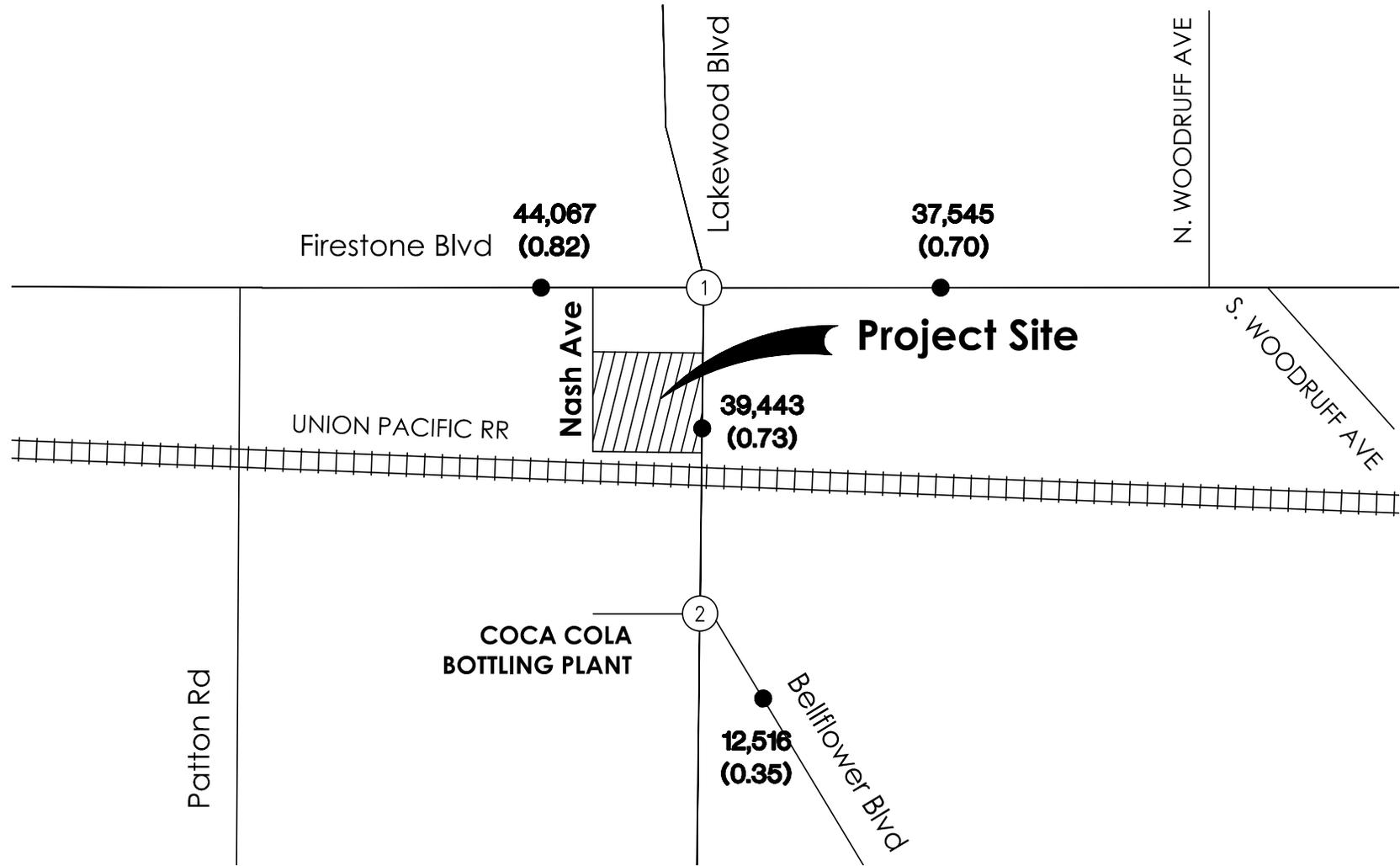


Figure 11B
Existing with Project PM Peak Hour Turning Movement and Roadway Link Volumes



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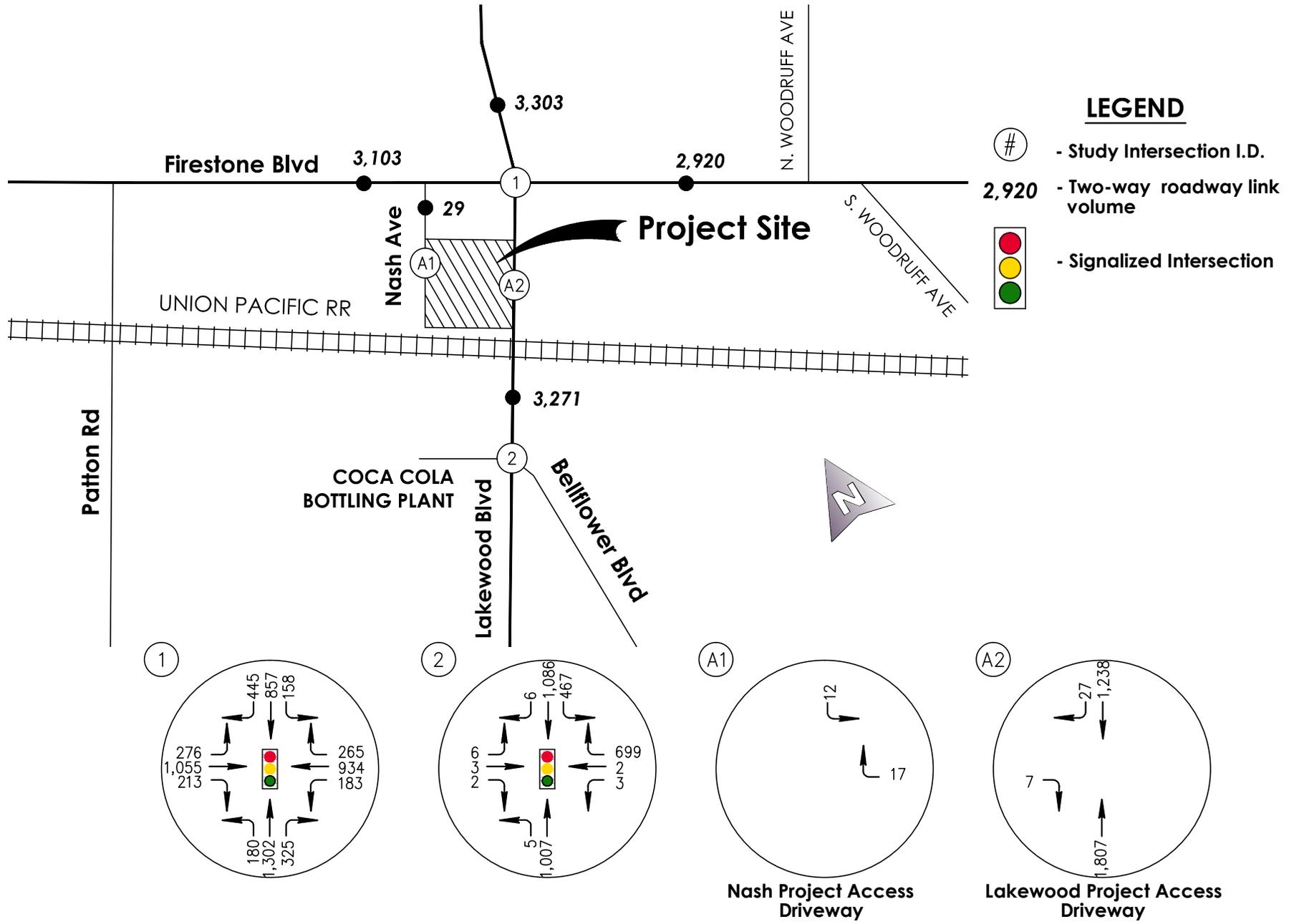


- Study Intersection ID No.

12,516 - Weekday 24-hr Roadway Traffic Volume

(0.35) - Volume to Capacity Ratio





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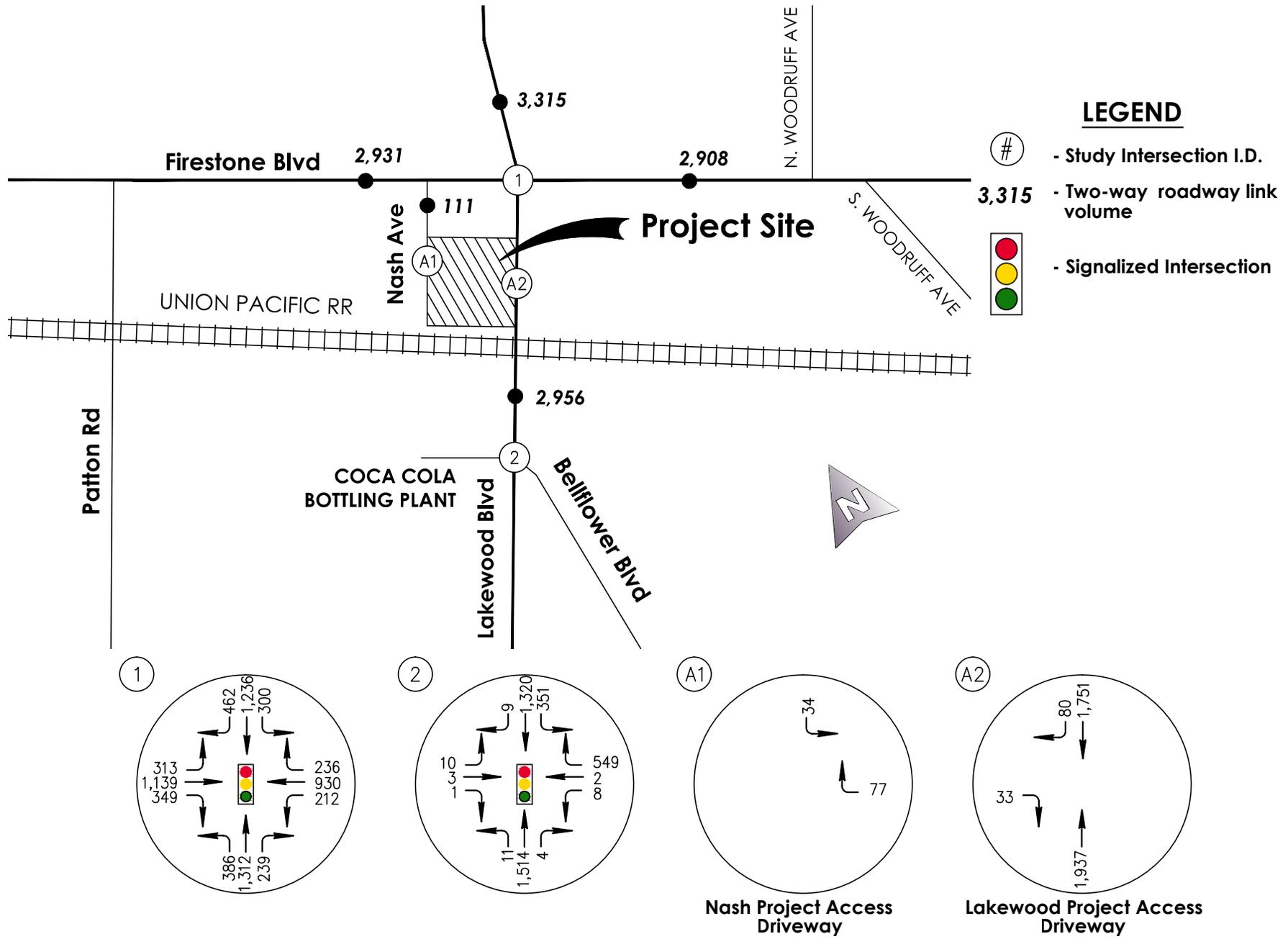
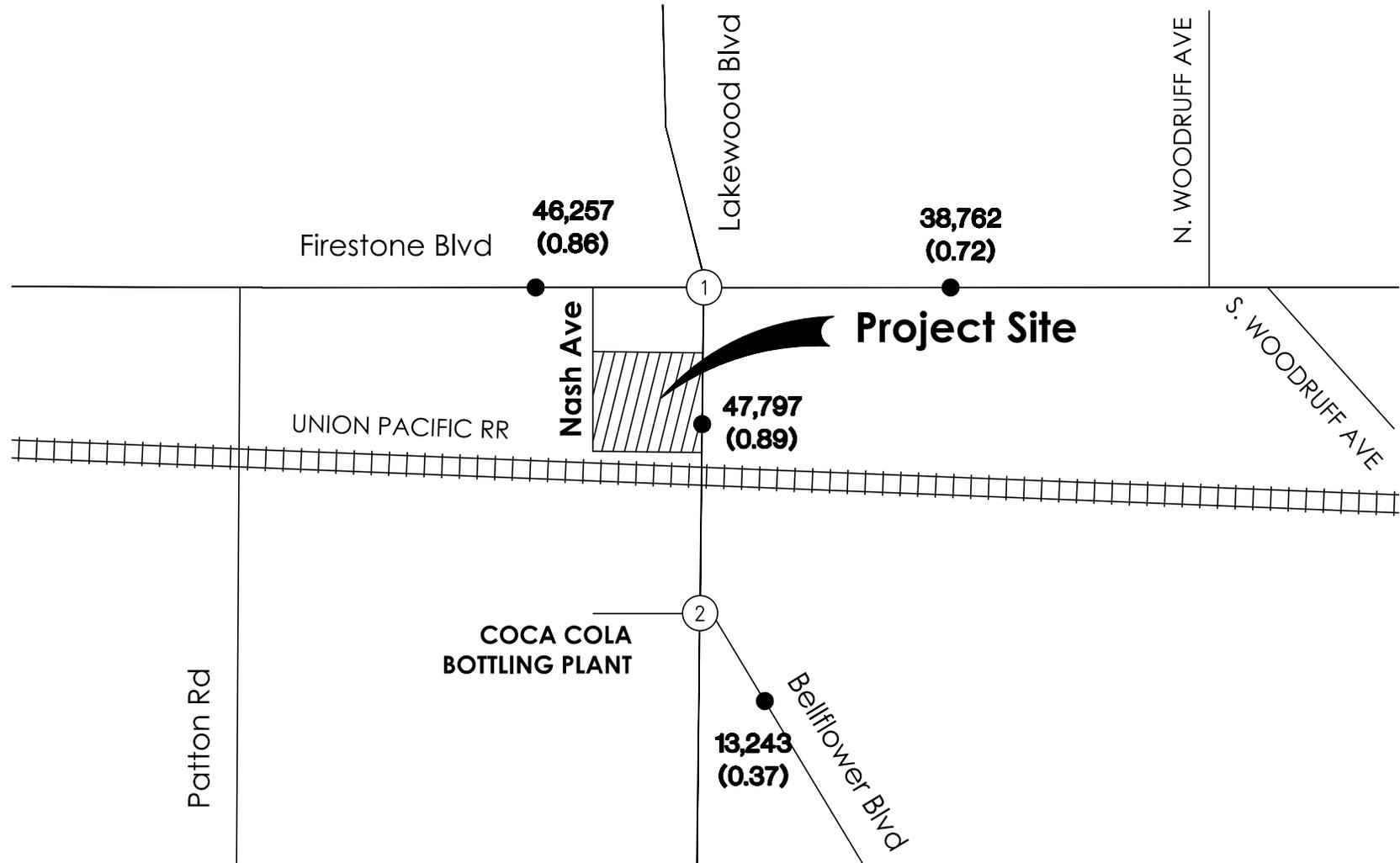


Figure 13B
 Baseline 2017 with Project PM Peak Hour Turning Movement and Roadway Link Volumes



LEGEND



- Study Intersection ID No.

13,243 - Weekday 24-hr Roadway Traffic Volume

(0.37) - Volume to Capacity Ratio



Figure 14
Baseline with Project Weekday 24-Hour Roadway Volumes and V/C Ratios

SECTION IV TRAFFIC ANALYSIS

To evaluate level of service at study area intersections with Existing 2016 and Baseline 2017 with project conditions, the Intersection Capacity Utilization (ICU) method has been used. The target level of service to be maintained throughout the project study area has been established by the City Downey as Level of Service D.

Existing (2016) and Baseline 2017 Conditions

Table 2 in Section II of this report shows that the study intersections are operating at desirable LOS C or better during existing am and pm peak hours.

To analyze Baseline 2017 (no project) conditions on the existing circulation network, an ambient growth factor of 1% per year has been applied to 2016 volumes and cumulative traffic from seventeen (17) other identified development projects within a 1 to 1.5-mile radius of the Project site have been considered. The results of this analysis are shown in Table 3.

Table 3 shows that with forecast Baseline 2017 peak hour volumes, the study intersections will continue to operate with the same LOS as for existing peak hour conditions, typically high LOS A or C, with the exception of Lakewood/Firestone during the pm peak hour. At this intersection the pm peak hour LOS is predicted to decline from the existing LOS C to D which is still within the City's acceptable range. This decline in LOS is due to the large number of cumulative development projects that are anticipated to contribute traffic to this intersection in the pm peak hour. The Baseline 2016 study area intersection and roadway configurations are considered to be the same as the existing (2016) network.

Existing 2016 with Project Conditions

Table 5 shows the results of intersection level of service analysis for Existing 2016 with Project traffic volume conditions. Table 5 shows that with forecast Existing 2016 and with

March 2016

Project peak hour volumes, the Lakewood/Firestone and Lakewood/Bellflower Intersections will continue to operate the same as for existing conditions at LOS C and A, respectively, during both peak hours.

Figure 12 shows that the roadways surrounding the Project site are predicted to operate below capacity based on 24-hour volumes for Existing 2016 with Project conditions.

Baseline 2017 with Project Conditions

Table 6 shows the results of intersection level of service analysis for Baseline 2017 with Project peak hour traffic conditions. Table 6 shows that with forecast Baseline 2017 with Project peak hour volumes, the Lakewood/Firestone and Lakewood/Bellflower intersections will continue to operate at the same Levels of Service C and A, respectively, as under Baseline 2017 conditions with the pm peak hour at Lakewood/Firestone being an exception. During the pm peak hour, the LOS at Lakewood/Firestone is predicted to decline by one service level to LOS 0.91-E.

The forecast project pm peak hour ICU-LOS of 0.91-E at the Lakewood/Firestone intersection does not meet City of Downey target LOS Criteria of LOS D or better. Level of Service E is exceeded during the pm peak hour because of project traffic volumes and the volumes generated by the other seventeen (17) cumulative development projects included in this study. It is noted that the threshold of LOS D (0.90) is exceed by a single (0.01) percentage point under project 2017 pm peak hour conditions.

The City of Downey has identified a future planned improvement to this intersection. This improvement would provide a second left-turn lane on both the northbound and southbound approaches of Lakewood Boulevard. Table 6 shows that with this planned improvement the impact of Project and other cumulative development traffic volumes would be mitigated and pm peak hour LOS improved to 0.80-C.

March 2016

Figure 14 shows that the roadways surrounding the Project site are predicted to remain below capacity based on 24-hour volumes for Baseline 2017 with Project conditions.

Project Fair Share Analysis

Table 7 shows the ALDI Food Market Project fair share contribution toward the Future Lakewood Boulevard/Firestone Boulevard intersection improvements to implement dual left-turn lanes on the Lakewood Boulevard north-south approaches. This fair share contribution is based on the percentage of the Project's pm peak hour traffic generation at the intersection to the total pm peak hour traffic at the intersection generated by project and the seventeen (17) cumulative development projects included in this study. Table 7 shows that based on total forecast pm peak hour development volumes at the intersection the Project's fair share contribution is 14.54%.

Project Access and Circulation

A Project access is provided to/from southbound Lakewood Boulevard via a right-in/right-out access driveway. An 11-foot wide right-turn/deceleration lane is provided for the ingress movement. The driveway and drive aisle width at this location is 30 feet. The planned on-site circulation for delivery trucks is to use this access and the 30-foot wide central aisle to reach the westerly side of the site where trucks will make a right-turn and pull ahead to the northwest corner of the site and then back into the delivery dock. Trucks will depart the site via a 42-foot wide driveway onto Nash Avenue. The drive aisle on the westerly portion of the site where trucks will maneuver to straighten out before backing to the dock has been designed to accommodate this movement and has a minimum width of 30 feet.

An analysis using AutoTurn software confirmed that an SU-40 vehicle can be accommodated within the 11-foot inbound right-turn lane and negotiate the intended on-site truck circulation route. Larger vehicles can also be accommodated on site; however, these vehicles need to begin their turn on Lakewood Boulevard into the site

March 2016

driveway from the through (No. 3) lane adjacent to the right-turn lane. SU-40 or other large vehicles may also use the No. 3 lane for turns to minimize the need for outgoing vehicles to yield to trucks at the driveway entrance. It is anticipated that truck deliveries can be scheduled for off-peak or after closing hours and will have no significant impact on typical site circulation.

The drive aisles for access to site parking are 25-feet in width which is desirable for two-way access to 90-degree parking.

The volumes and types of movements (primarily right-turns and right-turns only) are not large enough or appropriate to consider signalization. Both of the project access driveways will be one-way stop-controlled.



TABLE 5
Existing (2016) with Project Level of Service at Study Area Intersections

Signalized Intersections	Existing (2016)				Existing 2016 with Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
1. Lakewood Boulevard / Firestone Boulevard	0.71	C	0.78	C	0.71	C	0.79	C
2. Lakewood Boulevard / Bellflower Boulevard	0.47	A	0.49	A	0.48	A	0.50	A



TABLE 6
Baseline (2017) with Project Level of Service at Study Area Intersections

Signalized Intersections	Baseline (2017)				Baseline 2017 with Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
1. Lakewood Boulevard / Firestone Boulevard	0.75	C	0.87	D	0.76	C	0.91	E
2. Lakewood Boulevard / Bellflower Boulevard	0.53	A	0.59	A	0.53	A	0.60	A

Signalized Intersections	2017 w/Project and Improvement				Comments
	AM Peak Hour		PM Peak Hour		
	ICU	LOS	ICU	LOS	
1. Lakewood Boulevard / Firestone Boulevard	0.71	C	0.80	C	Add Second Left-turn lanes on NB/SB Lakewood Boulevard Approaches



Table 7 - Project Year 2017 Fair Share Analysis

**Project Fair Share Analysis at
Intersection No. 1 Lakewood Boulevard and Firestone Boulevard Intersection - Weekday PM Peak Hour
Provide Dual Left-turn Lanes on Lakewood Boulevard (N/S) Approaches**

NBLT	NBT	NBRT	SBLT	SBT	SBRT	EBLT	EBT	EBRT	WBLT	WBT	WBRT	Total	Scenario
197	271	0	1	51	192	72	80	132	23	58	3	1080	2017 Total Development Volumes
163	271	0	1	28	192	17	58	132	0	58	3	923	2017 Cumulative Project Volumes
34	0	0	0	23	0	55	22	0	23	0	0	157	Project Only Volumes
												14.54%	PM Peak Hour Fair Share %

SECTION V **FINDINGS AND RECOMMENDATIONS**

Study Area Circulation Impacts

Under existing (2016) conditions, the intersections included in this study are operating at desirable level of service based on existing peak hour intersection volumes and improvements. The Lakewood Boulevard/Firestone Boulevard intersection is operating at LOS C in both peak hours and the Lakewood Boulevard/Bellflower Boulevard intersection is operating at LOS A during both peak hours. Study area roadways are operating below capacity based on weekday 24-hour roadway volumes.

For Existing 2016 with Project conditions the study intersections will continue to operate at the same level of service as for existing no project conditions at LOS C and A. For Baseline 2017 (no project) conditions there is no change in LOS at either intersection during peak hours with the exception of Lakewood/Firestone during the pm peak hour. The pm peak hour LOS at this intersection is forecast to decline to LOS D under Baseline 2017 conditions. This decline in LOS is due to the large number of other cumulative development projects (17) whose traffic volumes have been included in this analysis.

For Baseline 2017 with Project conditions, only the pm peak hour LOS at Lakewood/Firestone is reduced with a forecast ICU-LOS of 0.91-E. The ICU is only 0.01 above the limit for LOS D. A Project fair share contribution of 14.54% has been identified for participation in a planned future City of Downey intersection improvement project that will provide dual left-turn lanes on the north-south Lakewood Boulevard approaches at Firestone Boulevard. This improvement is forecast to return the level of service to LOS C in both peak hours under future Year 2017 with Project peak hour traffic conditions.

On-site Circulation and Access

There are no concerns regarding on-site circulation associated with the proposed project. The project access driveways and parking aisles are appropriately sized and configured for the project volumes and truck circulation. A right-in/right-out only access with a dedicated right-turn/deceleration lane on southbound Lakewood will minimize the impact of driveway access on Lakewood Boulevard through traffic. Sight-distance requirements at project access driveways will be provided per agency standards. The project access driveways will be one-way stop-controlled on the driveway approach. Site parking supply has been provided to exceed City code requirements.

APPENDIX

Appendix A

Existing Peak Hour Intersection Turning Movement and 24-Hour Roadway Counts

ITM Peak Hour Summary

Prepared by:

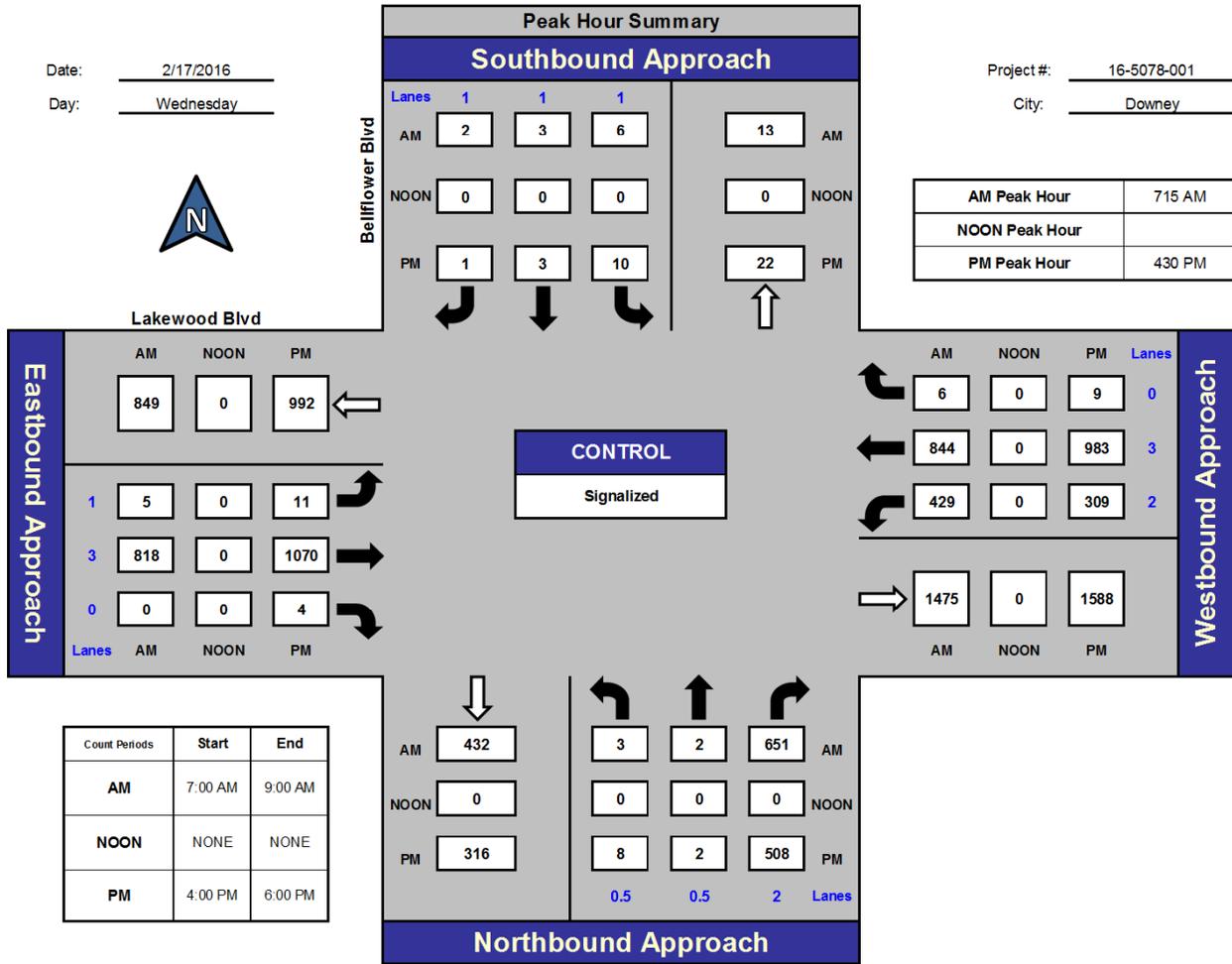


National Data & Surveying Services

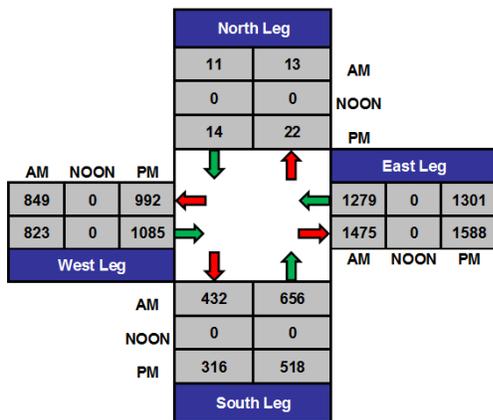
Bellflower Blvd and Lakewood Blvd, Downey

Date: 2/17/2016
Day: Wednesday

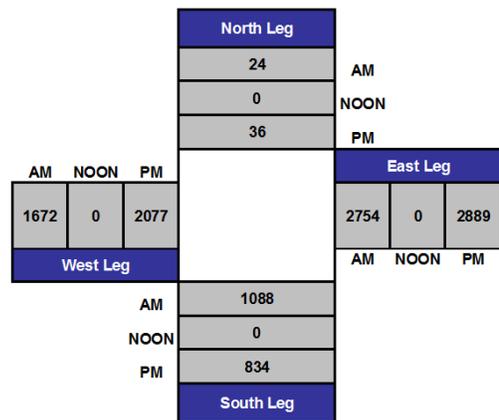
Project #: 16-5078-001
City: Downey



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

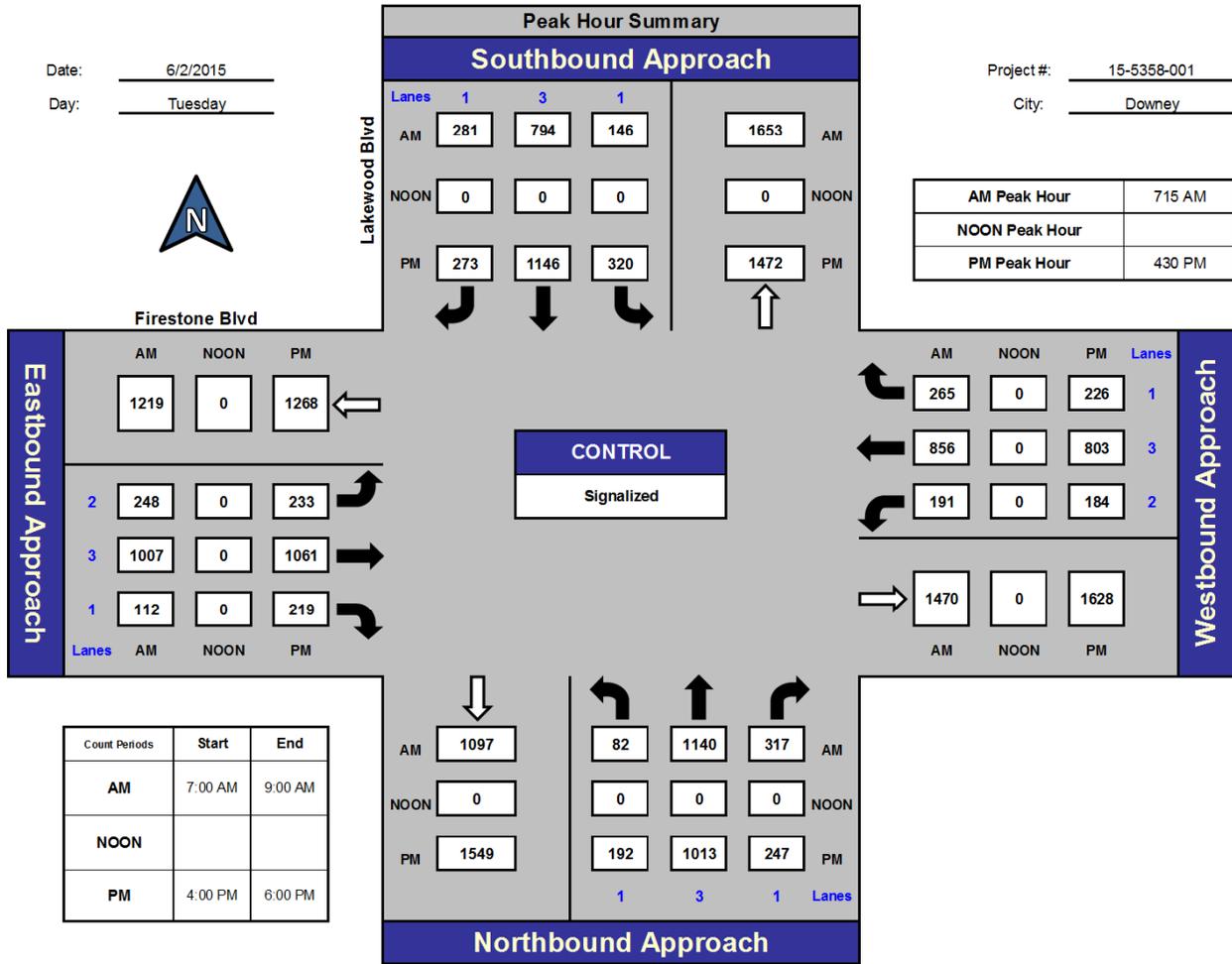


National Data & Surveying Services

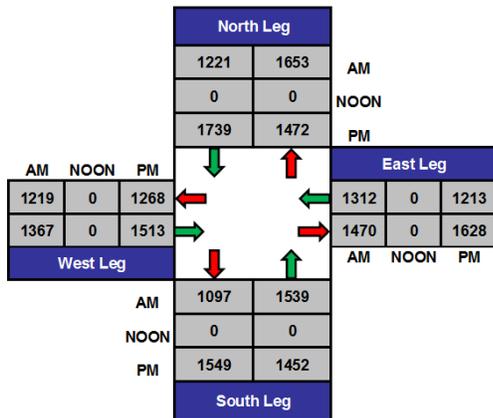
Lakewood Blvd and Firestone Blvd, Downey

Date: 6/2/2015
Day: Tuesday

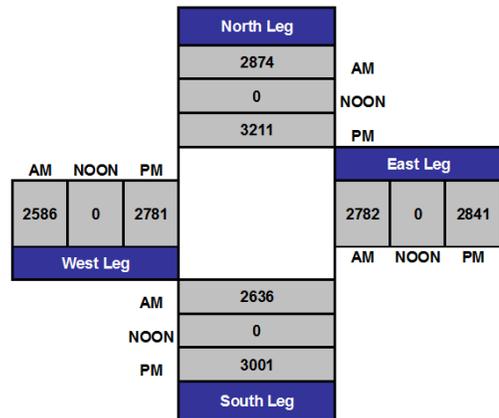
Project #: 15-5358-001
City: Downey



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

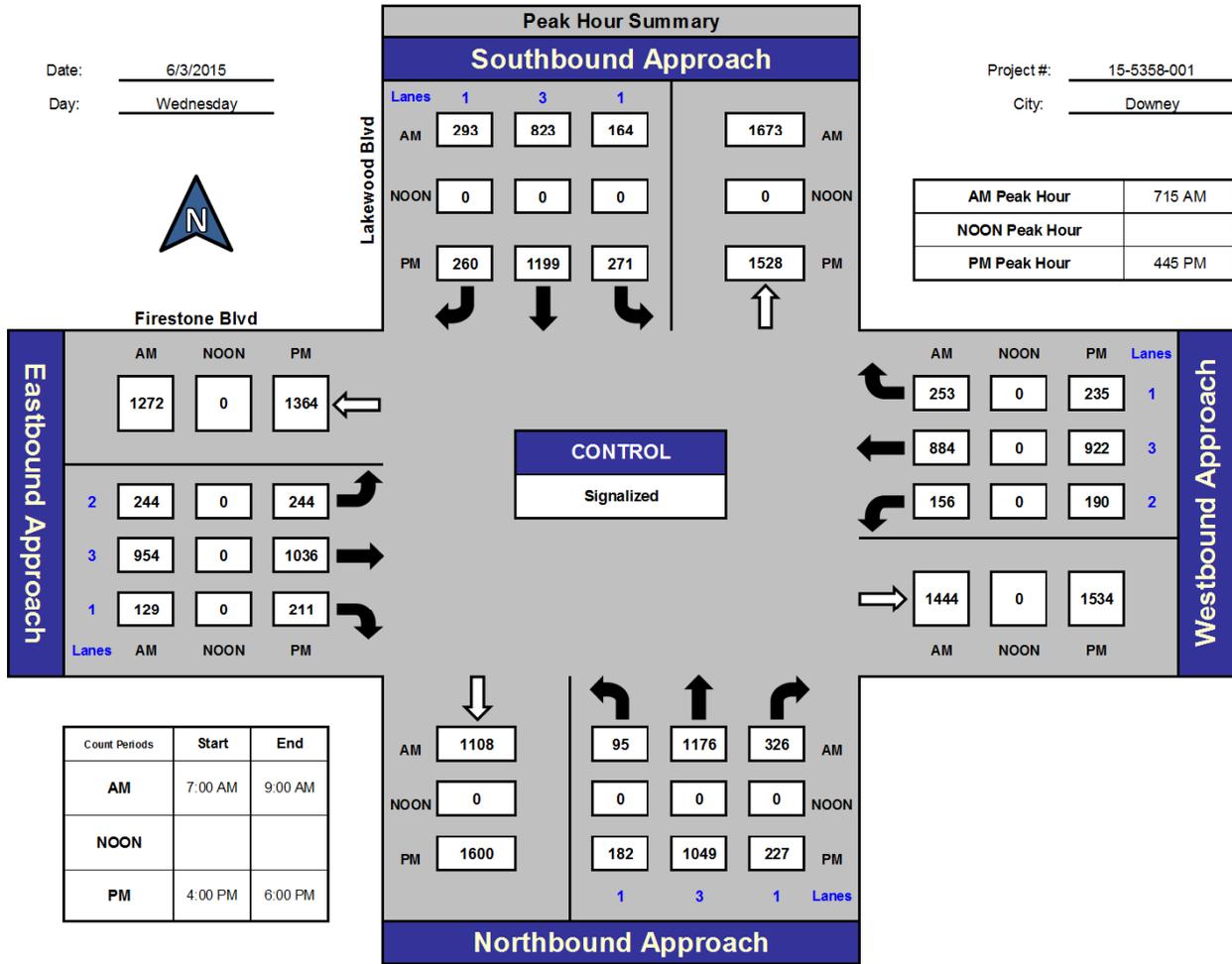


National Data & Surveying Services

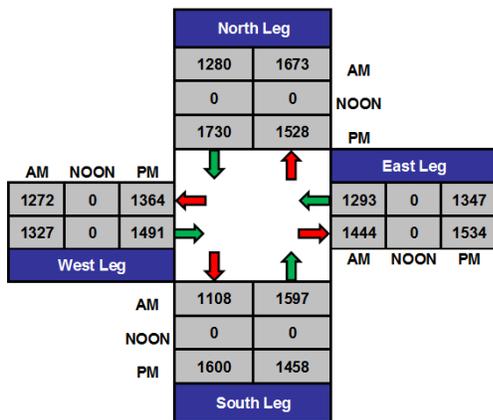
Lakewood Blvd and Firestone Blvd, Downey

Date: 6/3/2015
Day: Wednesday

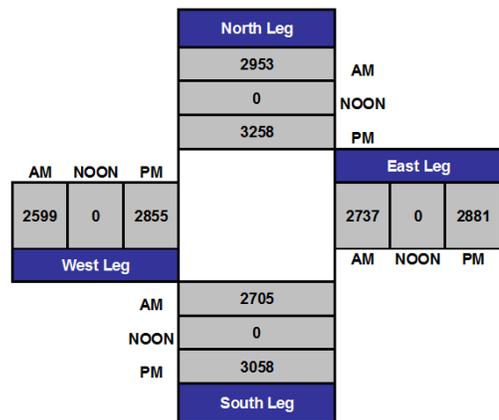
Project #: 15-5358-001
City: Downey



Total Ins & Outs



Total Volume Per Leg



Lakewood Blvd and Firestone Blvd , Downey AVERAGED

Southbound Approach

AM	287	809	155
PM	267	1173	296

AM	PM
246	239
981	1049
121	215

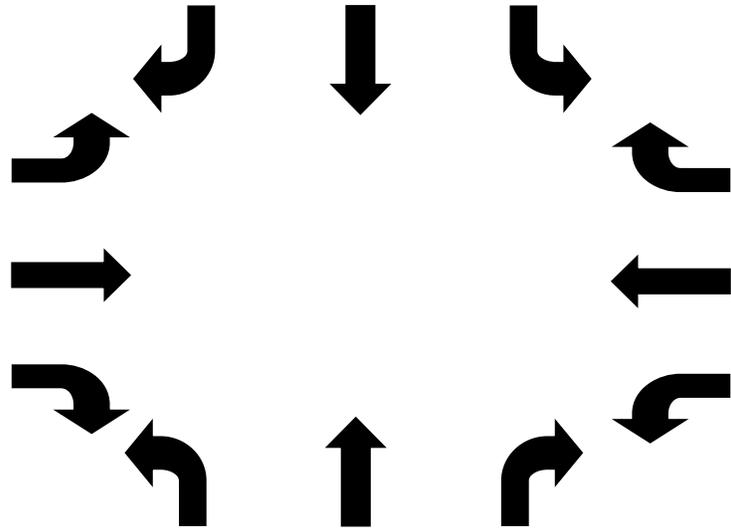
AM	PM
259	231
870	863
174	187

AM	89	1158	322
PM	187	1031	237

Northbound Approach

Eastbound Approach

Westbound Approach



DAILY TOTALS											NB	SB	EB	WB	To
											7,187	4,934	0	0	12,
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TO				
00:00	18	14	0	0	32	12:00	120	76	0	0	196				
00:15	10	14	0	0	24	12:15	115	74	0	0	189				
00:30	13	6	0	0	19	12:30	87	83	0	0	170				
00:45	13	54	10	44	0	0	23	98	83	405	80	313	0	0	163
01:00	6	9	0	0	15	13:00	104	75	0	0	179				
01:15	5	5	0	0	10	13:15	102	65	0	0	167				
01:30	6	7	0	0	13	13:30	110	78	0	0	188				
01:45	9	26	4	25	0	0	13	51	92	408	74	292	0	0	166
02:00	11	5	0	0	16	14:00	139	77	0	0	216				
02:15	6	5	0	0	11	14:15	139	75	0	0	214				
02:30	14	2	0	0	16	14:30	161	104	0	0	265				
02:45	6	37	4	16	0	0	10	53	125	564	79	335	0	0	204
03:00	6	1	0	0	7	15:00	161	73	0	0	234				
03:15	4	5	0	0	9	15:15	132	89	0	0	221				
03:30	15	8	0	0	23	15:30	119	98	0	0	217				
03:45	3	28	7	21	0	0	10	49	162	574	69	329	0	0	231
04:00	8	3	0	0	11	16:00	110	64	0	0	174				
04:15	10	6	0	0	16	16:15	104	77	0	0	181				
04:30	13	13	0	0	26	16:30	141	75	0	0	216				
04:45	17	48	26	48	0	0	43	96	134	489	89	305	0	0	223
05:00	23	17	0	0	40	17:00	121	76	0	0	197				
05:15	20	26	0	0	46	17:15	121	72	0	0	193				
05:30	37	27	0	0	64	17:30	104	92	0	0	196				
05:45	39	119	55	125	0	0	94	244	104	450	69	309	0	0	173
06:00	42	36	0	0	78	18:00	92	91	0	0	183				
06:15	89	35	0	0	124	18:15	100	63	0	0	163				
06:30	114	63	0	0	177	18:30	95	72	0	0	167				
06:45	113	358	40	174	0	0	153	532	105	392	70	296	0	0	175
07:00	100	69	0	0	169	19:00	99	75	0	0	174				
07:15	209	77	0	0	286	19:15	79	92	0	0	171				
07:30	218	127	0	0	345	19:30	98	53	0	0	151				
07:45	129	656	132	405	0	0	261	1061	68	344	61	281	0	0	129
08:00	103	101	0	0	204	20:00	94	55	0	0	149				
08:15	129	77	0	0	206	20:15	63	57	0	0	120				
08:30	121	75	0	0	196	20:30	71	48	0	0	119				
08:45	120	473	76	329	0	0	196	802	60	288	54	214	0	0	114
09:00	86	73	0	0	159	21:00	56	54	0	0	110				
09:15	88	65	0	0	153	21:15	50	48	0	0	98				
09:30	90	45	0	0	135	21:30	43	47	0	0	90				
09:45	90	354	64	247	0	0	154	601	24	173	29	178	0	0	53
10:00	84	61	0	0	145	22:00	42	25	0	0	67				
10:15	63	50	0	0	113	22:15	31	27	0	0	58				
10:30	99	63	0	0	162	22:30	29	23	0	0	52				
10:45	100	346	63	237	0	0	163	583	11	113	13	88	0	0	24
11:00	120	64	0	0	184	23:00	17	19	0	0	36				
11:15	105	43	0	0	148	23:15	20	16	0	0	36				
11:30	108	78	0	0	186	23:30	13	22	0	0	35				
11:45	88	421	58	243	0	0	146	664	17	67	23	80	0	0	40
TOTALS	2920		1914		4834	TOTALS	4267		3020						
SPLIT %	60.4%		39.6%		39.9%	SPLIT %	58.6%		41.4%						

DAILY TOTALS											NB	SB	EB	WB	To
											7,187	4,934	0	0	12,

AM Peak Hour	07:15	07:15			07:15	PM Peak Hour	14:45	15:00		
AM Pk Volume	659	437			1096	PM Pk Volume	586	345		
Pk Hr Factor	0.756	0.828			0.794	Pk Hr Factor	0.834	0.839		
7 - 9 Volume	1129	734	0	0	1863	4 - 6 Volume	939	614	0	0
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:30	16:45		
7 - 9 Pk Volume	659	437	0	0	1096	4 - 6 Pk Volume	517	329	0	0
Pk Hr Factor	0.756	0.828	0.000	0.000	0.794	Pk Hr Factor	0.917	0.894	0.000	0.000

Prepared by NDS/ATD

DAILY TOTALS					NB	SB					To			
					0	0	EB	WB			38,			
							20,266	18,387						
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TO			
00:00	0	0	45	34	79	12:00	0	0	374	271	645			
00:15	0	0	40	39	79	12:15	0	0	375	305	680			
00:30	0	0	34	32	66	12:30	0	0	345	370	715			
00:45	0	0	29	148	26	131	12:45	0	0	388	1482	331	1277	719
01:00	0	0	21	27	48	13:00	0	0	395	342	737			
01:15	0	0	20	19	39	13:15	0	0	265	348	613			
01:30	0	0	46	28	74	13:30	0	0	289	322	611			
01:45	0	0	21	108	15	89	13:45	0	0	296	1245	282	1294	578
02:00	0	0	23	9	32	14:00	0	0	332	265	597			
02:15	0	0	16	16	32	14:15	0	0	314	322	636			
02:30	0	0	15	18	33	14:30	0	0	351	375	726			
02:45	0	0	11	65	16	59	14:45	0	0	357	1354	367	1329	724
03:00	0	0	18	15	33	15:00	0	0	361	342	703			
03:15	0	0	15	14	29	15:15	0	0	363	343	706			
03:30	0	0	18	23	41	15:30	0	0	395	315	710			
03:45	0	0	37	88	24	76	15:45	0	0	417	1536	339	1339	756
04:00	0	0	21	22	43	16:00	0	0	383	303	686			
04:15	0	0	30	24	54	16:15	0	0	345	298	643			
04:30	0	0	52	48	100	16:30	0	0	419	313	732			
04:45	0	0	43	146	55	149	16:45	0	0	415	1562	351	1265	766
05:00	0	0	48	61	109	17:00	0	0	350	288	638			
05:15	0	0	61	75	136	17:15	0	0	369	345	714			
05:30	0	0	104	72	176	17:30	0	0	305	336	641			
05:45	0	0	91	304	111	319	17:45	0	0	365	1389	318	1287	683
06:00	0	0	120	101	221	18:00	0	0	320	373	693			
06:15	0	0	156	113	269	18:15	0	0	304	320	624			
06:30	0	0	218	165	383	18:30	0	0	255	300	555			
06:45	0	0	229	723	208	587	18:45	0	0	297	1176	278	1271	575
07:00	0	0	303	228	531	19:00	0	0	246	298	544			
07:15	0	0	375	270	645	19:15	0	0	261	244	505			
07:30	0	0	475	366	841	19:30	0	0	224	278	502			
07:45	0	0	304	1457	361	1225	19:45	0	0	235	966	275	1095	510
08:00	0	0	290	281	571	20:00	0	0	185	216	401			
08:15	0	0	398	202	600	20:15	0	0	164	215	379			
08:30	0	0	341	231	572	20:30	0	0	145	184	329			
08:45	0	0	341	1370	218	932	20:45	0	0	161	655	153	768	314
09:00	0	0	250	223	473	21:00	0	0	121	147	268			
09:15	0	0	289	176	465	21:15	0	0	124	178	302			
09:30	0	0	280	184	464	21:30	0	0	163	133	296			
09:45	0	0	336	1155	212	795	21:45	0	0	113	521	105	563	218
10:00	0	0	313	192	505	22:00	0	0	72	103	175			
10:15	0	0	273	249	522	22:15	0	0	82	63	145			
10:30	0	0	316	229	545	22:30	0	0	66	59	125			
10:45	0	0	283	1185	255	925	22:45	0	0	57	277	79	304	136
11:00	0	0	279	263	542	23:00	0	0	52	58	110			
11:15	0	0	275	255	530	23:15	0	0	57	54	111			
11:30	0	0	297	274	571	23:30	0	0	48	58	106			
11:45	0	0	306	1157	301	1093	23:45	0	0	40	197	45	215	85
TOTALS			7906	6380	14286	TOTALS			12360	12007				
SPLIT %			55.3%	44.7%	37.0%	SPLIT %			50.7%	49.3%				

DAILY TOTALS					NB	SB					To
					0	0	EB	WB			38,
							20,266	18,387			

AM Peak Hour			07:30	07:15	07:15	PM Peak Hour			16:15	15:00
AM Pk Volume			1467	1278	2722	PM Pk Volume			1529	1427
Pk Hr Factor			0.772	0.873	0.809	Pk Hr Factor			0.912	0.976
7 - 9 Volume	0	0	2827	2157	4984	4 - 6 Volume	0	0	2951	2552
7 - 9 Peak Hour			07:30	07:15	07:15	4 - 6 Peak Hour			16:00	16:45
7 - 9 Pk Volume	0	0	1467	1278	2722	4 - 6 Pk Volume	0	0	1562	1320
Pk Hr Factor	0.000	0.000	0.772	0.873	0.809	Pk Hr Factor	0.000	0.000	0.932	0.940

DAILY TOTALS					NB	SB			EB	WB	To				
					23,473	19,804			0	0	43,				
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TO				
00:00	50	66	0	0	116	12:00	345	319	0	0	664				
00:15	45	42	0	0	87	12:15	396	336	0	0	732				
00:30	38	41	0	0	79	12:30	368	309	0	0	677				
00:45	34	167	33	182	0	0	334	1443	372	1336	0	0	706		
01:00	42	20	0	0	62	13:00	376	307	0	0	683				
01:15	28	26	0	0	54	13:15	347	325	0	0	672				
01:30	17	27	0	0	44	13:30	383	316	0	0	699				
01:45	15	102	15	88	0	0	359	1465	329	1277	0	0	688		
02:00	20	24	0	0	44	14:00	381	316	0	0	697				
02:15	23	10	0	0	33	14:15	365	303	0	0	668				
02:30	13	10	0	0	23	14:30	374	323	0	0	697				
02:45	12	68	15	59	0	0	391	1511	364	1306	0	0	755		
03:00	11	18	0	0	29	15:00	404	353	0	0	757				
03:15	10	12	0	0	22	15:15	398	380	0	0	778				
03:30	15	24	0	0	39	15:30	363	329	0	0	692				
03:45	29	65	20	74	0	0	49	139	384	1549	344	1406	0	0	728
04:00	23	26	0	0	49	16:00	376	342	0	0	718				
04:15	39	32	0	0	71	16:15	368	346	0	0	714				
04:30	36	42	0	0	78	16:30	406	362	0	0	768				
04:45	61	159	48	148	0	0	109	307	385	1535	347	1397	0	0	732
05:00	50	61	0	0	111	17:00	339	339	0	0	678				
05:15	77	56	0	0	133	17:15	368	347	0	0	715				
05:30	80	73	0	0	153	17:30	422	364	0	0	786				
05:45	136	343	122	312	0	0	258	655	367	1496	314	1364	0	0	681
06:00	134	121	0	0	255	18:00	368	327	0	0	695				
06:15	231	134	0	0	365	18:15	328	321	0	0	649				
06:30	345	181	0	0	526	18:30	392	289	0	0	681				
06:45	336	1046	203	639	0	0	539	1685	344	1432	292	1229	0	0	636
07:00	358	226	0	0	584	19:00	386	305	0	0	691				
07:15	410	292	0	0	702	19:15	323	314	0	0	637				
07:30	515	395	0	0	910	19:30	310	298	0	0	608				
07:45	458	1741	335	1248	0	0	793	2989	294	1313	276	1193	0	0	570
08:00	357	248	0	0	605	20:00	276	256	0	0	532				
08:15	400	227	0	0	627	20:15	275	260	0	0	535				
08:30	370	239	0	0	609	20:30	272	227	0	0	499				
08:45	339	1466	235	949	0	0	574	2415	279	1102	222	965	0	0	501
09:00	322	228	0	0	550	21:00	249	187	0	0	436				
09:15	300	225	0	0	525	21:15	206	154	0	0	360				
09:30	301	198	0	0	499	21:30	237	174	0	0	411				
09:45	274	1197	286	937	0	0	560	2134	192	884	127	642	0	0	319
10:00	257	240	0	0	497	22:00	165	117	0	0	282				
10:15	308	337	0	0	645	22:15	156	133	0	0	289				
10:30	316	269	0	0	585	22:30	140	89	0	0	229				
10:45	296	1177	288	1134	0	0	584	2311	123	584	94	433	0	0	217
11:00	320	278	0	0	598	23:00	116	77	0	0	193				
11:15	309	309	0	0	618	23:15	81	55	0	0	136				
11:30	326	302	0	0	628	23:30	79	67	0	0	146				
11:45	306	1261	344	1233	0	0	650	2494	91	367	54	253	0	0	145
TOTALS	8792		7003		15795		TOTALS	14681		12801					
SPLIT %	55.7%		44.3%		36.5%		SPLIT %	53.4%		46.6%					

DAILY TOTALS					NB	SB			EB	WB	To
					23,473	19,804			0	0	43,

AM Peak Hour	07:00	11:45		07:15	PM Peak Hour	15:00	15:15			
AM Pk Volume	1741	1308		3010	PM Pk Volume	1567	1426			
Pk Hr Factor	0.845	0.951		0.827	Pk Hr Factor	0.959	0.918			
7 - 9 Volume	3207	2197	0	0	5404	4 - 6 Volume	3031	2761	0	0
7 - 9 Peak Hour	07:00	07:15		07:15	4 - 6 Peak Hour	16:00	16:00			
7 - 9 Pk Volume	1741	1270	0	0	3010	4 - 6 Pk Volume	1535	1397	0	0
Pk Hr Factor	0.845	0.804	0.000	0.000	0.827	Pk Hr Factor	0.945	0.965	0.000	0.000

Appendix B

Level of Service Computation Reports (ICU Calculations-signalized)

B.1

Existing AM and PM Peak Hours

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 1. Lakewood Blvd (N/S) and Firestone Blvd (E/W)

CONDITION: Existing (June 2015)

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	89	187	0.06	0.12
NT	3	4800	1158	1031	0.24 *	0.21 *
NR	1	1600	322	237	0.20	0.15
SL	1	1600	155	296	0.10 *	0.19 *
ST	3	4800	809	1173	0.17	0.24
SR	1	1600	287	267	0.18	0.17
EL	2	2880	246	239	0.09 *	0.08
ET	3	4800	981	1049	0.20	0.22 *
ER	1	1600	121	215	0.08	0.13
WL	2	2880	174	187	0.06	0.06 *
WT	3	4800	870	863	0.18 *	0.18
WR	1	1600	259	231	0.16	0.14

CLEARANCE	0.10	0.10
CRITICAL RIGHT	-	-
ICU	0.71	0.78
LOS	C	C

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 2. Lakewood Blvd (N/S) and Bellflower Blvd (E/W)

CONDITION: Existing (February 2016)

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	5	11	0.00	0.01
NT	3	4800	818	1070	0.17 *	0.22 *
NR	0	0	0	4	0.00	0.00
SL	2	2880	429	309	0.15 *	0.11 *
ST	3	4800	844	983	0.18	0.21
SR	0	0	6	9	0.00	0.01
EL	1	1600	6	10	0.00 *	0.01 *
ET	1	1600	3	3	0.00	0.00
ER	1	1600	2	1	0.00	0.00
WL	0	0	3	8	0.00	0.01
WT	1	1600	2	2	0.00 *	0.01 *
WR	2	3200	651	508	0.20	0.16

CLEARANCE	0.10	0.10
CRITICAL RIGHT	0.05	0.04
ICU	0.47	0.49
LOS	A	A

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

B.2

Baseline 2017 AM and PM Peak Hours

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 1. Lakewood Blvd (N/S) and Firestone Blvd (E/W)

CONDITION: 2017 Baseline (No Project)

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	168	352	0.11	0.22 *
NT	3	4800	1302	1312	0.27 *	0.27
NR	1	1600	325	239	0.20	0.15
SL	1	1600	158	300	0.10 *	0.19
ST	3	4800	849	1213	0.18	0.25 *
SR	1	1600	445	462	0.28	0.29
EL	2	2880	264	258	0.09 *	0.09
ET	3	4800	1050	1117	0.22	0.23 *
ER	1	1600	213	349	0.13	0.22
WL	2	2880	176	189	0.06	0.07 *
WT	3	4800	934	930	0.19 *	0.19
WR	1	1600	265	236	0.17	0.15

CLEARANCE	0.10	0.10
CRITICAL RIGHT	-	-
ICU	0.75	0.87
LOS	C	D

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 2. Lakewood Blvd (N/S) and Bellflower Blvd (E/W)

CONDITION: 2017 Baseline (No Project)

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	5	11	0.00	0.01
NT	3	4800	1001	1497	0.21 *	0.31 *
NR	0	0	0	4	0.00	0.00
SL	2	2880	464	335	0.16 *	0.12 *
ST	3	4800	1082	1303	0.23	0.27
SR	0	0	6	9	0.00	0.01
EL	1	1600	6	10	0.00 *	0.01 *
ET	1	1600	3	3	0.00	0.00
ER	1	1600	2	1	0.00	0.00
WL	0	0	2	8	0.00	0.01
WT	1	1600	2	2	0.00 *	0.01 *
WR	2	3200	693	532	0.22	0.17

CLEARANCE	0.10	0.10
CRITICAL RIGHT	0.06	0.04
ICU	0.53	0.59
LOS	A	A

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

B.3

Existing with Project AM and PM Peak Hours

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 1. Lakewood Blvd (N/S) and Firestone Blvd (E/W)

CONDITION: Existing (June 2015) with Project

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	101	221	0.06	0.14
NT	3	4800	1158	1031	0.24 *	0.21 *
NR	1	1600	322	237	0.20	0.15
SL	1	1600	155	296	0.10 *	0.19 *
ST	3	4800	817	1196	0.17	0.25
SR	1	1600	287	267	0.18	0.17
EL	2	2880	258	294	0.09 *	0.10
ET	3	4800	986	1071	0.21	0.22 *
ER	1	1600	121	215	0.08	0.13
WL	2	2880	181	210	0.06	0.07 *
WT	3	4800	870	863	0.18 *	0.18
WR	1	1600	259	231	0.16	0.14

CLEARANCE	0.10	0.10
CRITICAL RIGHT	-	-
ICU	0.71	0.79
LOS	C	C

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 2. Lakewood Blvd (N/S) and Bellflower Blvd (E/W)

CONDITION: Existing (February 2016) with Project

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	5	11	0.00	0.01
NT	3	4800	824	1087	0.17 *	0.23 *
NR	0	0	0	4	0.00	0.00
SL	2	2880	432	325	0.15 *	0.11 *
ST	3	4800	848	1000	0.18	0.21
SR	0	0	6	9	0.00	0.01
EL	1	1600	6	10	0.00 *	0.01 *
ET	1	1600	3	3	0.00	0.00
ER	1	1600	2	1	0.00	0.00
WL	0	0	3	8	0.00	0.01
WT	1	1600	2	2	0.00 *	0.01 *
WR	2	3200	657	525	0.21	0.16

CLEARANCE	0.10	0.10
CRITICAL RIGHT	0.06	0.04
ICU	0.48	0.50
LOS	A	A

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

B.4

Baseline 2017 with Project AM and PM Peak Hours

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 1. Lakewood Blvd (N/S) and Firestone Blvd (E/W)

CONDITION: 2017 Baseline with Project

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	180	386	0.11	0.24 *
NT	3	4800	1302	1312	0.27 *	0.27
NR	1	1600	325	239	0.20	0.15
SL	1	1600	158	300	0.10 *	0.19
ST	3	4800	857	1236	0.18	0.26 *
SR	1	1600	445	462	0.28	0.29
EL	2	2880	276	313	0.10 *	0.11
ET	3	4800	1055	1139	0.22	0.24 *
ER	1	1600	213	349	0.13	0.22
WL	2	2880	183	212	0.06	0.07 *
WT	3	4800	934	930	0.19 *	0.19
WR	1	1600	265	236	0.17	0.15

CLEARANCE	0.10	0.10
CRITICAL RIGHT	-	-
ICU	0.76	0.91
LOS	C	E

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 2. Lakewood Blvd (N/S) and Bellflower Blvd (E/W)

CONDITION: 2017 Baseline with Project

DATE: 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	1	1600	5	11	0.00	0.01
NT	3	4800	1007	1514	0.21 *	0.32 *
NR	0	0	0	4	0.00	0.00
SL	2	2880	467	351	0.16 *	0.12 *
ST	3	4800	1086	1320	0.23	0.28
SR	0	0	6	9	0.00	0.01
EL	1	1600	6	10	0.00 *	0.01 *
ET	1	1600	3	3	0.00	0.00
ER	1	1600	2	1	0.00	0.00
WL	0	0	3	8	0.00	0.01
WT	1	1600	2	2	0.00 *	0.01 *
WR	2	3200	699	549	0.22	0.17

CLEARANCE	0.10	0.10
CRITICAL RIGHT	0.06	0.04
ICU	0.53	0.60
LOS	A	A

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.

B.5

LOS Computation at Project Intersection 1 with Mitigation

**INTERSECTION CAPACITY UTILIZATION
CALCULATION WORKSHEET**

INTERSECTION 1. Lakewood Blvd (N/S) and Firestone Blvd (E/W)

CONDITION: 2017 Baseline with Project and NB/SB Dual left-turns **DATE:** 09-Mar-16

INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

MOVEMENT	LANES	SAT. CAPACITY (C)	VOLUME		V/C	
			AM	PM	AM	PM
NL	2	2880	180	386	0.06	0.13 *
NT	3	4800	1302	1312	0.27 *	0.27
NR	1	1600	325	239	0.20	0.15
SL	2	2880	158	300	0.05 *	0.10
ST	3	4800	857	1236	0.18	0.26 *
SR	1	1600	445	462	0.28	0.29
EL	2	2880	276	313	0.10 *	0.11
ET	3	4800	1055	1139	0.22	0.24 *
ER	1	1600	213	349	0.13	0.22
WL	2	2880	183	212	0.06	0.07 *
WT	3	4800	934	930	0.19 *	0.19
WR	1	1600	265	236	0.17	0.15

CLEARANCE	0.10	0.10
CRITICAL RIGHT	-	-
ICU	0.71	0.80
LOS	C	C

NOTE: ICU is the sum of critical movements denoted by an asterisk (*) plus critical right-turn value if any.