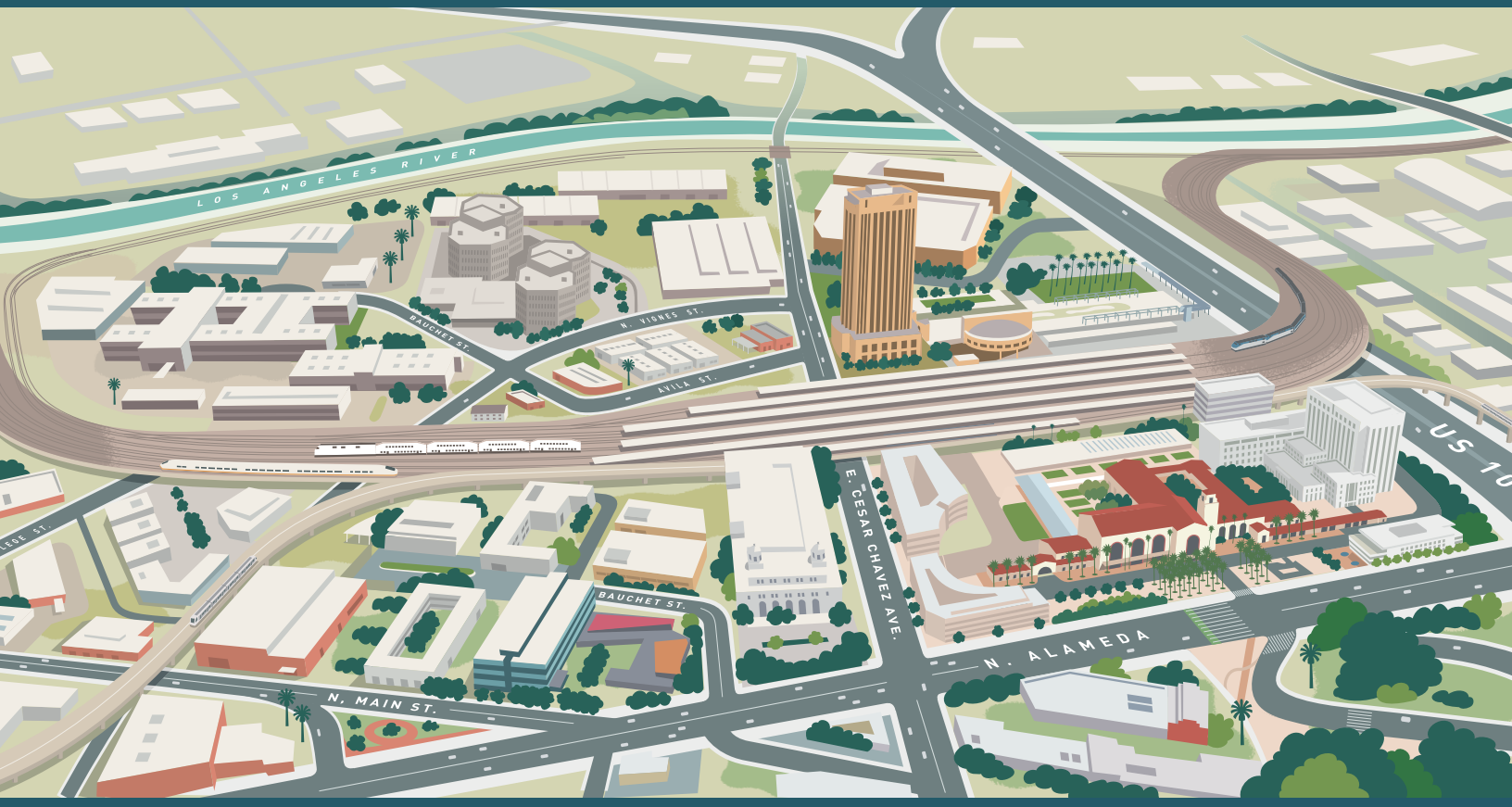
Los Angeles County
Metropolitan Transportation Authority

Link Union Station

Traffic Impact Assessment

June 2019



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7.5.6 Project Trip Distribution and Assignment

Project trip distribution assumptions for the project study area were developed using the SCAG regional traffic model as a guide and considered the project site access, surrounding land uses, and the roadway network. Figure 7-30 shows the trip distribution percentages discussed and approved by LADOT as part of the MOU process. Appendix K presents the allocation of project-related traffic volumes at each study intersection.

7.6 2031 and 2040 plus Project Traffic Projections

For 2031, the full build-out of the major project elements is assumed to be complete and the concourse is assumed to be in operation generating traffic. The plus project traffic conditions for this year are a combination of the traffic associated with the 2031 no project condition with the addition of project-related traffic. For 2031, the following project-related roadway modifications are assumed to be in place:

- Commercial Street (west of Center Street) would be realigned north toward US-101.
- Commercial Street (east of Center Street) would be vacated.
- A new Division 20 access road would be in place with a new intersection at Center Street.

The 2031 plus project conditions peak hour intersection turning movement volumes are illustrated on Figure 7-31.

For 2040, project-related traffic was added to the 2040 no project condition projection to obtain the 2040 plus project traffic forecast. 2040 plus project condition peak hour intersection turning movement volumes are illustrated on Figure 7-32.

7.7 US-101 Main line 2031 and 2040 Traffic Projections and Geometry

Traffic conditions on the portion of the US-101 main line north of Vignes Street were studied for traffic impacts associated with implementation of the proposed project or the build alternative. Currently, there are four northbound and four southbound lanes at this location. The existing lane configuration is assumed to be present in 2031 and 2040, consistent with the SCAG 2016 RTP/SCS model. Traffic projections for 2031 and 2040 for the US-101 main line were developed using the methodology from the previous study as indicated in the regional model.

No project forecasts were developed by adding background traffic growth to the existing volumes obtained from the SCAG 2016 RTP/SCS model. An annual growth rate of 0.2 percent per year was conservatively assumed in the development of the 2031 and 2040 no project forecasts based on the SCAG 2016 RTP/SCS model. For the purposes of this analysis, it has been assumed that run-through tracks infrastructure south of LAUS would not impact US-101 on- and off-ramp operations because these ramps would be retained through 2040.

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Figure 7-30. Project-Related Trip Distribution

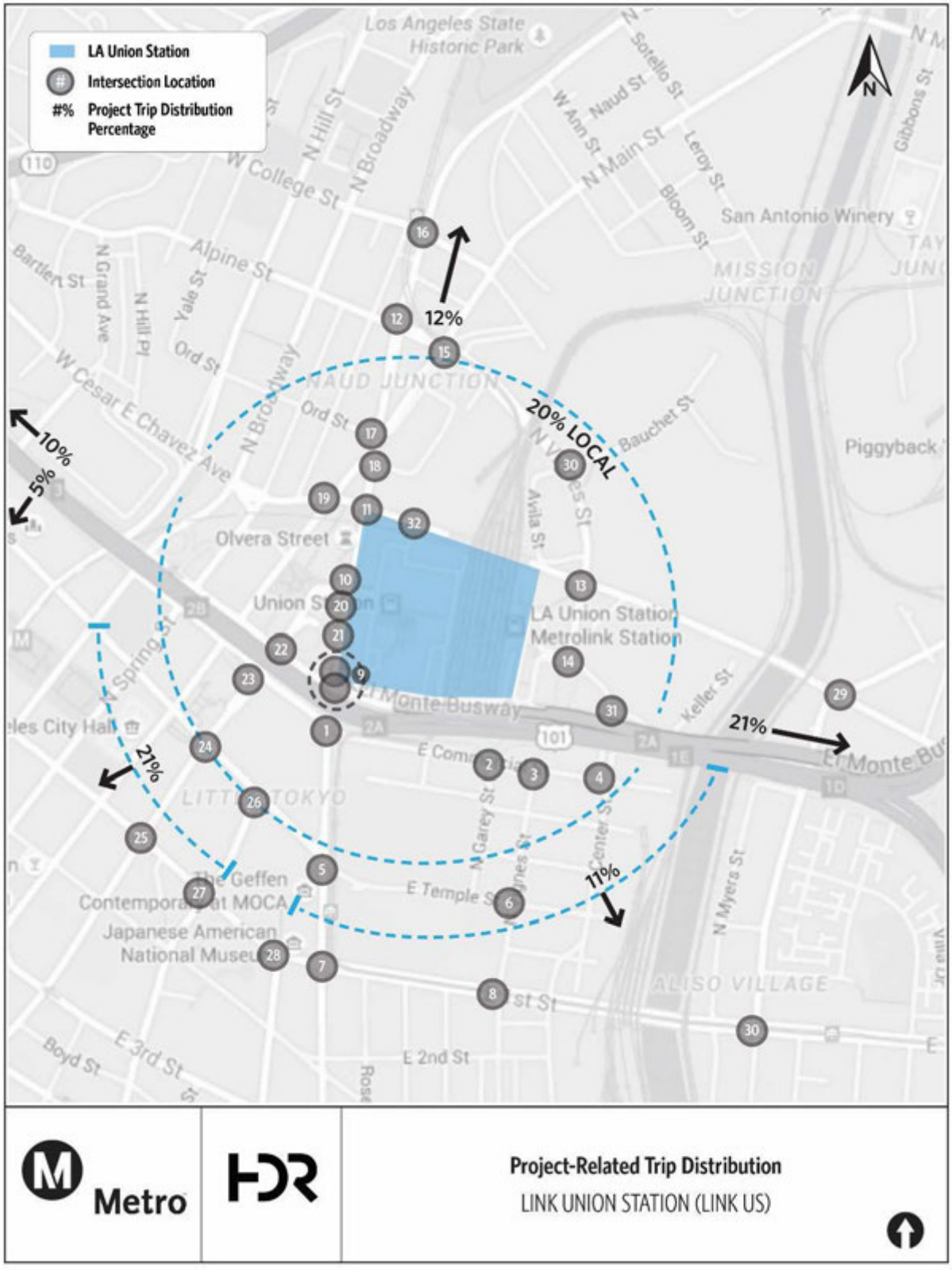

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Figure 7-31. 2031 plus Project - Peak Hour Traffic Volumes

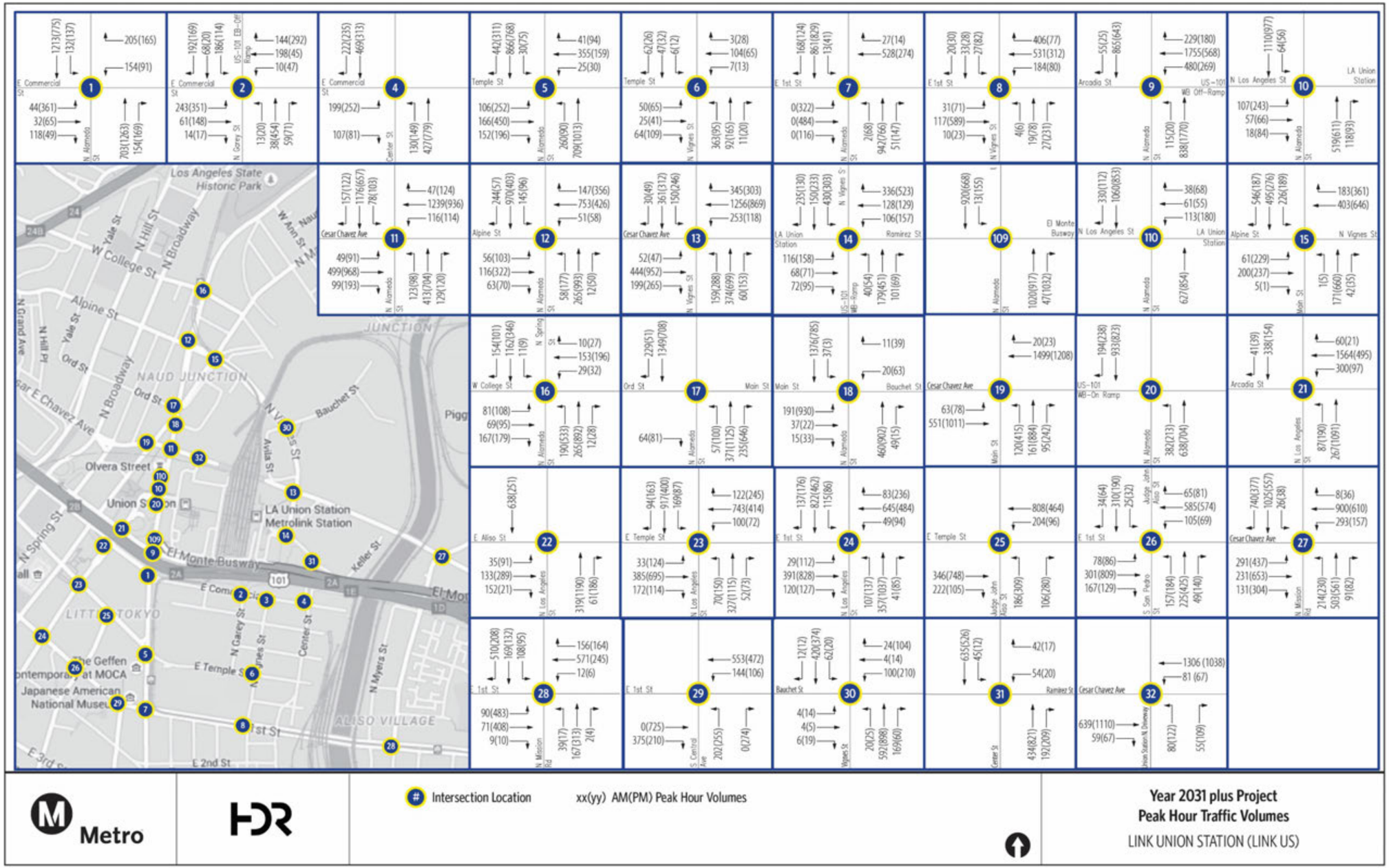

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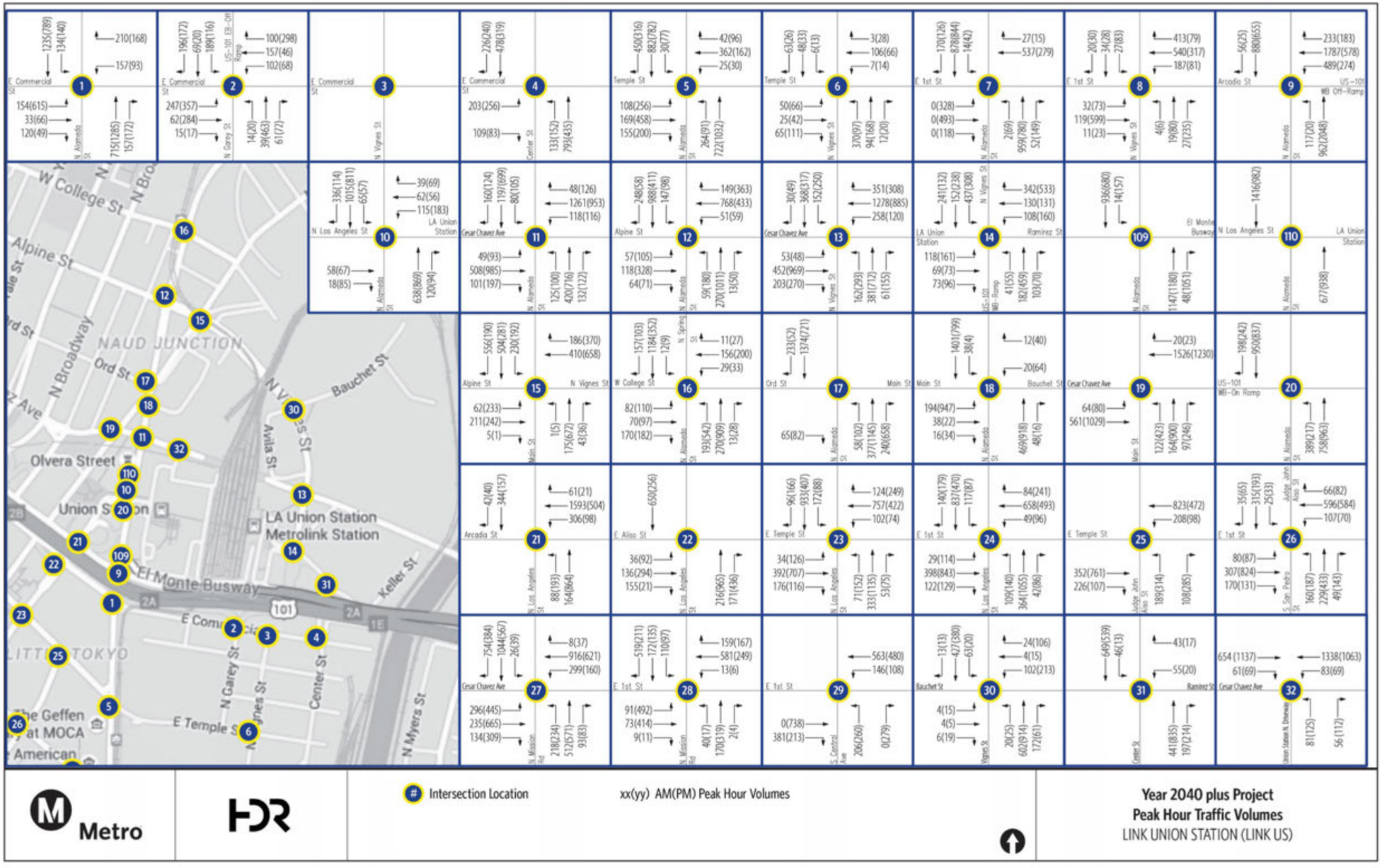
Figure 7-32. 2040 plus Project - Peak Hour Traffic Volumes



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8.0 Traffic Impact Analysis

This section provides a description of the analysis methodology and projected 2031 and 2040 traffic conditions both with and without the project. The analysis scenarios include:

- 2031 no project condition
- 2040 no project condition
- 2031 plus project construction (proposed project with an above-grade passenger concourse with new expanded passageway)
- 2031 plus project construction (build alternative with an at-grade passenger concourse)
- 2031 plus project condition
- 2040 plus project condition

8.1 2031 No Project Condition

For the purpose of the study, 2031 corresponds to "opening year" when construction of the new lead tracks, elevated rail yard and new passenger concourse, and run-through track infrastructure are complete. The no project traffic condition is analyzed to determine conditions without the project. The 2031 no project condition also assumes that the *Connect US Action Plan* (Metro 2015) has not been implemented. Therefore, the same roadway network conditions would exist in 2031 as the existing condition (2016).

The no project condition consists of the cumulative base traffic conditions that reflect the background traffic growth. The cumulative traffic growth rate in the study area is 0.2 percent for each future year. This growth rate was confirmed during a meeting with LADOT on May 25, 2016, and is incorporated as part of the approved MOU by LADOT. The cumulative base forecasts were developed by applying the annual 0.2 percent traffic growth rate to the existing (base year 2016) volumes and adding the cumulative project-related trips to the ambient growth.

Table 8-1 summarizes 2031 no project Condition LOS during the AM and PM peak hours for the study intersections, and Appendix L presents the Synchro worksheets for each study intersection. Most intersections operate at a good to excellent LOS, LOS C or better, during both AM and PM peak hours. The analysis shows that the following intersections perform at LOS E during the PM peak hour:

- Intersection 4: Center Street and Commercial Street
- Intersection 15: Vignes Street and Main Street
- Intersection 27: Mission Road and Cesar Chavez Avenue

8.2 2040 No Project Conditions

The 2040 no project condition assumes the completion of the proposed LAUS Forecourt and Esplanade Improvements project. This would result in following modifications in the study area:

- Reduction of one through lane in northbound and southbound direction along Alameda Street
- Addition of a curb-side drop-off zone on the east side of Alameda Street
- Wider sidewalks on the west side of Alameda Street
- Reconfiguration of driveway into LAUS, which would result in merging of entrance and exit into a single leg (east leg) of the intersection of Los Angeles Street at Alameda Street
- Restricted left turn from Los Angeles Street to Alameda Street

Table 8-2 summarizes the 2040 no project condition LOS during the AM and the PM peak hours for the study intersections, and Appendix L presents the Synchro worksheets for each study intersection.

Table 8-1. 2031 No Project Condition Intersection Level of Service

Intersection	Intersection	AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
1	Alameda Street and Commercial Street	29.1	0.57	C	35.1	0.86	D
2	Garey Street and Commercial Street	31.3	0.39	C	34.1	0.49	C
3	Vignes Street and Commercial Street [a]	9.8	0.39	A	10.1	0.40	B
4	Center Street and Commercial Street [a]	17.2	0.71	C	57.5	1.18	**F**
5	Alameda Street and Temple Street	14.6	0.67	B	16.7	0.74	B
6	Vignes Street and Temple Street [a]	15.4	0.72	C	9.9	0.42	A
7	Alameda Street and First Street	18.3	0.54	B	17.3	0.61	B
8	Vignes Street and First Street	20.2	0.51	C	27.6	0.59	C
9	Alameda Street and El Monte Busway/Arcadia Street	21.1	0.88	C	14.6	0.62	B
10	Alameda Street and Los Angeles Street EB	12.1	0.32	B	12.4	0.34	B
110	Alameda Street and Los Angeles Street WB	4.3	0.34	A	5.7	0.30	A
11	Alameda Street and Cesar Chavez Avenue	20.7	0.77	C	17.1	0.69	B
12	Alameda Street and Vignes Street/Alpine Street	11.6	0.58	B	13.8	0.62	B
13	Vignes Street and Cesar Chavez Avenue	18.5	0.78	B	25.1	0.86	C
14	Vignes Street and Ramirez Street	23.3	0.43	C	24.5	0.53	C
15	Vignes Street and Main Street	27.2	0.59	C	74.6	1.01	**E**
16	Alameda Street/Spring Street and College Street	16.5	0.61	B	17.7	0.71	B
17	Alameda Street and Main Street/Ord Street [a]	0.7	0.34	A	0.7	0.41	A
18	Alameda Street and Main Street/Bauchet Street	5.8	0.42	A	9.6	0.57	A
19	Main Street and Cesar Chavez Avenue	7.7	0.44	A	19.8	0.64	B
20	Alameda Street and Northbound US-101 [b]	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	7.7	0.59	A	4.8	0.52	A
22	Los Angeles Street and Aliso Street	9.4	0.30	A	11.8	0.61	B
23	Los Angeles Street and Temple Street	15.2	0.61	B	17.6	0.78	B
24	Los Angeles Street and First Street	15.2	0.55	B	20.7	0.90	C
25	Judge John Aiso Street and Temple Street	8.3	0.40	A	8.0	0.43	A

Table 8-1. 2031 No Project Condition Intersection Level of Service

Intersection	Intersection	AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
26	Judge John Aiso Street/San Pedro Street and First Street	15.6	0.44	B	15.3	0.66	B
27	Mission Road and Cesar Chavez Avenue	58.0	1.11	**E**	25.6	0.89	C
28	Mission Road and First Street	25.8	0.81	C	33.2	0.89	C
29	Central Avenue and First Street	8.8	0.33	A	11.3	0.49	B
30	Vignes Street and Bauchet Street	11.4	0.29	B	20.0	0.49	B
31	Ramirez Street and Center Street	1.7	0.24	A	0.6	0.35	A
32	Union Station North Driveway and Cesar Chavez Avenue	13.6	0.54	B	14.0	0.51	B

Notes:

[a] ***Non-signalized intersection***

[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***

V/C=volume to capacity; LOS=level of service; EB=eastbound; WB=westbound.

Table 8-2. 2040 No Project Intersection Level of Service

Intersection	Intersection	AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
1	Alameda Street and Commercial Street	31.6	0.62	C	47.8	0.98	D
2	Garey Street and Commercial Street	31.3	0.39	C	34.6	0.49	C
3	Vignes Street and Commercial Street [a]	9.8	0.39	A	10.2	0.41	B
4	Center Street and Commercial Street [a]	18	0.73	C	62.5	1.22	**F**
5	Alameda Street and Temple Street	16.3	0.69	B	16.9	0.75	B
6	Vignes Street and Temple Street [a]	15.9	0.73	C	10	0.43	A
7	Alameda Street and First Street	18.5	0.55	B	16.2	0.63	B
8	Vignes Street and First Street	21.1	0.51	C	26.9	0.59	C
9	Alameda Street and El Monte Busway/Arcadia Street	90.3	0.89	**F**	15.7	0.69	B
10	Alameda Street and Union Station South	28.0	0.65	C	15.5	0.59	B

Table 8-2. 2040 No Project Intersection Level of Service

Intersection	Intersection	AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
110	Alameda Street and Union Station North [a]	0.1	0.45	A	0.2	0.31	A
11	Alameda Street and Cesar Chavez Avenue	19.5	0.87	B	14.1	0.75	B
12	Alameda Street and Vignes Street/Alpine Street	12.5	0.59	B	14.4	0.63	B
13	Vignes Street and Cesar Chavez Avenue	18.1	0.79	B	21	0.88	C
14	Vignes Street and Ramirez Street	23.3	0.43	C	26	0.54	C
15	Vignes Street and Main Street	18.8	0.60	B	62.8	1.04	**E**
16	Alameda Street/Spring Street and College Street	16.8	0.63	B	16.8	0.73	B
17	Alameda Street and Main Street/Ord Street [a]	0.7	0.35	A	0.7	0.42	A
18	Alameda Street and Main Street/Bauchet Street	5.3	0.42	A	14	0.60	B
19	Main Street and Cesar Chavez Avenue	7.1	0.45	A	19.6	0.67	B
20	Alameda Street and Northbound US-101[b]	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	8.9	0.62	A	5.9	0.44	A
22	Los Angeles Street and Aliso Street	10.1	0.30	B	12.1	0.64	B
23	Los Angeles Street and Temple Street	15.1	0.62	B	18	0.82	B
24	Los Angeles Street and First Street	14.1	0.56	B	21.9	0.97	C
25	Judge John Aiso Street and Temple Street	7.8	0.41	A	8.2	0.44	A
26	Judge John Aiso Street/San Pedro Street and First Street	16.1	0.45	B	15.4	0.67	B
27	Mission Road and Cesar Chavez Avenue	59.7	1.21	**E**	26.6	0.92	C
28	Mission Road and First Street	26.9	0.83	C	36.9	0.93	D
29	Central Avenue and First Street	9.1	0.33	A	11.4	0.50	B
30	Vignes Street and Bauchet Street	11.8	0.29	B	20.9	0.50	C
31	Ramirez Street and Center Street	1.8	0.25	A	0.7	0.36	A
32	Union Station North Driveway and Cesar Chavez Avenue	13.0	0.54	B	14.1	0.52	B

Note:

[a] ***Non-signalized intersection***

[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***

V/C=volume to capacity; LOS=level of service

The following four intersections experience deficient LOS for the 2040 no project condition:

AM Peak Hour:

- Intersection #9: Alameda Street at El Monte Busway/Arcadia Street (LOS F)
- Intersection #27: Mission Road at Cesar Chavez Avenue (LOS E)

PM Peak Hour:

- Intersection #4: Center Street and Commercial Street (LOS F)
- Intersection #15: Vignes Street at Main Street (LOS E)

LOS F at Alameda Street at El Monte Busway/Arcadia Street (Intersection #9) is due to implementation of the LAUS Forecourt and Esplanade Improvements project, which includes a one-lane reduction on Alameda Street between Cesar Chavez Avenue and Arcadia Street. Finally, the intersections of Center Street at Commercial Street, Cesar Chavez Avenue at Mission Road, and Vignes Street at Main Street would perform at an LOS E or F without the project in 2040.

8.3 2031 plus Project Construction Condition

As discussed earlier, a full closure of the intersection of Center Street and Commercial Street would be required during construction, which would result in changes in traffic patterns through the study area and, thus, would require traffic detouring. Given that traffic would be diverted to intersections adjacent to Center Street at Commercial Street, the LOS of these adjacent intersections would be affected.

Table 8-4 and Table 8-3 summarizes peak hour LOS for all study locations for the 2031 plus project construction condition for the proposed project and build alternative, respectively. Appendix M presents the Synchro worksheets for each study intersection.

According to LADOT Guidelines, when utilizing the HCM methodology for signalized intersections for transportation infrastructure projects, a transportation impact shall be deemed "significant" in accordance with Table 5-4 (LADOT 2016).

The following three intersections are likely to be impacted during construction if the proposed project with an above-grade passenger concourse with new expanded passageway is constructed concurrent with other project-related infrastructure (lead tracks, elevated rail yard, and run-through track infrastructure):

- Intersection #2: Garey Street and Commercial Street (LOS E – AM and PM peaks)
- Intersection #10: Alameda Street and Los Angeles Street EB (LOS C – PM peak)
- Intersection #15: Vignes Street and Main Street (LOS E – PM peak; no impact on AM peak)

In the 2031 plus project construction conditions for the (build alternative with an at-grade passenger concourse, the following five intersections are likely to be impacted if all project-related infrastructure is constructed concurrently:

- Intersection #1: Alameda Street and Commercial Street (LOS D – PM peak)
- Intersection #2: Garey Street and Commercial Street (LOS E – AM peak)
- Intersection #10: Alameda Street and Los Angeles Street EB (LOS C – PM peak)
- Intersection #15: Vignes Street and Main Street (LOS F – PM peak; no impact on AM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (LOS E – AM peak)

Table 8-3. 2031 plus Project Construction (Above-Grade Passenger Concourse with New Expanded Passageway) Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?	2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
1	Alameda Street and Commercial Street	29.1	C	32.9	C	3.8	No	35.1	D	38.6	D	3.5	No
2	Garey Street and Commercial Street	31.3	C	63.5	**E**	32.2	**Yes**	34.1	C	38.2	D	4.1	**Yes**
3	Vignes Street and Commercial Street [a]	9.8	A	NA	NA	NA	NA	10.1	B	NA	NA	NA	NA
4	Center Street and Commercial Street [a]	17.2	C	NA	NA	NA	NA	57.5	**F**	NA	NA	NA	NA
5	Alameda Street and Temple Street	14.6	B	14.4	B	-0.2	No	16.7	B	15.6	B	-1.1	No
6	Vignes Street and Temple Street [a]	15.4	C	16.7	C	1.3	No	9.9	A	9.9	A	0.0	No
7	Alameda Street and First Street	18.3	B	18.0	B	-0.3	No	17.3	B	18.2	B	0.9	No
8	Vignes Street and First Street	20.2	C	22.2	C	2	No	27.6	C	25.4	C	-2.2	No
9	Alameda Street and El Monte Busway/Arcadia Street	21.1	C	21.6	C	0.5	No	14.6	B	15.0	B	0.4	No
10	Alameda Street and Los Angeles Street EB	12.1	B	12.7	B	0.6	No	12.4	B	31.0	C	18.6	**Yes**
110	Alameda Street and Los Angeles Street WB	4.3	A	4.2	A	-0.1	No	5.7	A	7.0	A	1.3	No
11	Alameda Street and Cesar Chavez Avenue	20.7	C	21.0	C	0.3	No	17.1	B	20.0	C	2.9	No
12	Alameda Street and Vignes Street/Alpine Street	11.6	B	13.0	B	1.4	No	13.8	B	14.1	B	0.3	No
13	Vignes Street and Cesar Chavez Avenue	18.5	B	18.2	B	-0.3	No	25.1	C	26.3	C	1.2	No
14	Vignes Street and Ramirez Street	23.3	C	23.2	C	-0.1	No	24.5	C	24.6	C	0.1	No
15	Vignes Street and Main Street	27.2	C	23.9	C	-3.3	No	74.6	**E**	78.9	**E**	4.3	**Yes**
16	Alameda Street/Spring Street and College Street	16.5	B	16.5	B	0	No	17.7	B	17.5	B	-0.2	No
17	Alameda Street and Main Street/Ord Street [a]	0.7	A	0.6	A	-0.1	No	0.7	A	0.7	A	0.0	No
18	Alameda Street and Main Street/Bauchet Street	5.8	A	5.9	A	0.1	No	9.6	A	10.5	B	0.9	No
19	Main Street and Cesar Chavez Avenue	7.7	A	7.9	A	0.2	No	19.8	B	19.9	B	0.1	No
20	Alameda Street and Northbound US-101 [b]	—	—	—	—	—	—	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	7.7	A	7.3	A	-0.4	No	4.8	A	4.8	A	0.0	No
22	Los Angeles Street and Aliso Street	9.4	A	9.5	A	0.1	No	11.8	B	11.9	B	0.1	No
23	Los Angeles Street and Temple Street	15.2	B	15.4	B	0.2	No	17.6	B	17.5	B	-0.1	No
24	Los Angeles Street and First Street	15.2	B	15.0	B	-0.2	No	20.7	C	21.7	C	1.0	No
25	Judge John Aiso Street and Temple Street	8.3	A	8.1	A	-0.2	No	8.0	A	8.0	A	0.0	No

Table 8-3. 2031 plus Project Construction (Above-Grade Passenger Concourse with New Expanded Passageway) Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?	2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
26	Judge John Aiso Street/San Pedro Street and First Street	15.6	B	15.8	B	0.2	No	15.3	B	14.2	B	-1.1	No
27	Mission Road and Cesar Chavez Avenue	58.0	**E**	57.3	**E**	-0.7	No	25.6	C	26.3	C	0.7	No
28	Mission Road and First Street	25.8	C	29.5	C	3.7	No	33.2	C	32.8	C	-0.4	No
29	Central Avenue and First Street	8.8	A	8.1	A	-0.7	No	11.3	B	12.1	B	0.8	No
30	Vignes Street and Bauchet Street	11.4	B	11.4	B	0	No	20.0	B	19.1	B	-0.9	No
31	Ramirez Street and Center Street	1.7	A	1.7	A	0	No	0.6	A	0.7	A	0.1	No
32	Union Station North Driveway and Cesar Chavez Avenue	13.6	B	13.6	B	0	No	14.0	B	14.0	B	0.0	No

Notes:

[a] ***Non-signalized intersection***

[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***

EB=eastbound; LOS=level of service; NA=not applicable; Sec=seconds; WB=westbound

Table 8-4. 2031 plus Project Construction (Build Alternative with At-Grade Passenger Concourse) Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?	2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
1	Alameda Street and Commercial Street	29.1	C	34.0	C	4.9	No	35.1	D	39.5	D	4.4	**Yes**
2	Garey Street and Commercial Street	31.3	C	60.6	**E**	29.3	**Yes**	34.1	C	37.8	D	3.7	No
3	Vignes Street and Commercial Street	9.8	A	NA	NA	NA	NA	10.1	B	NA	NA	NA	NA
4	Center Street and Commercial Street [a]	17.2	C	NA	NA	NA	NA	57.5	**F**	NA	NA	NA	NA
5	Alameda Street and Temple Street	14.6	B	14.6	B	0	No	16.7	B	15.6	B	-1.1	No
6	Vignes Street and Temple Street [a]	15.4	C	19.6	C	4.2	No	9.9	A	10.0	B	0.1	No
7	Alameda Street and First Street	18.3	B	17.9	B	-0.4	No	17.3	B	18.4	B	1.1	No
8	Vignes Street and First Street	20.2	C	22.5	C	2.3	No	27.6	C	26.1	C	-1.5	No
9	Alameda Street and El Monte Busway/Arcadia Street	21.1	C	21.8	C	0.7	No	14.6	B	15.0	B	0.4	No
10	Alameda Street and Los Angeles Street EB	12.1	B	12.7	B	0.6	No	12.4	B	31.1	C	18.7	**Yes**
110	Alameda Street and Los Angeles Street WB	4.3	A	4.1	A	-0.2	No	5.7	A	6.9	A	1.2	No
11	Alameda Street and Cesar Chavez Avenue	20.7	C	21.5	C	0.8	No	17.1	B	20.2	C	3.1	No
12	Alameda Street and Vignes Street/Alpine Street	11.6	B	13.1	B	1.5	No	13.8	B	14.0	B	0.2	No
13	Vignes Street and Cesar Chavez Avenue	18.5	B	18.1	B	-0.4	No	25.1	C	26.7	C	1.6	No
14	Vignes Street and Ramirez Street	23.3	C	23.2	C	-0.1	No	24.5	C	24.9	C	0.4	No
15	Vignes Street and Main Street	27.2	C	25.0	C	-2.2	No	74.6	**E**	90.8	**F**	16.2	**Yes**
16	Alameda Street/Spring Street and College Street	16.5	B	16.5	B	0	No	17.7	B	17.6	B	-0.1	No
17	Alameda Street and Main Street/Ord Street [a]	0.7	A	0.6	A	-0.1	No	0.7	A	0.7	A	0	No
18	Alameda Street and Main Street/Bauchet Street	5.8	A	6.1	A	0.3	No	9.6	A	10.5	B	0.9	No
19	Main Street and Cesar Chavez Avenue	7.7	A	8.1	A	0.4	No	19.8	B	20.0	B	0.2	No
20	Alameda Street and Northbound US-101 [b]	—	—	—	—	—	—	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	7.7	A	7.4	A	-0.3	No	4.8	A	4.8	A	0	No
22	Los Angeles Street and Aliso Street	9.4	A	9.6	A	0.2	No	11.8	B	11.9	B	0.1	No
23	Los Angeles Street and Temple Street	15.2	B	15.5	B	0.3	No	17.6	B	17.5	B	-0.1	No
24	Los Angeles Street and First Street	15.2	B	15.0	B	-0.2	No	20.7	C	22.1	C	1.4	No
25	Judge John Aiso Street and Temple Street	8.3	A	8.1	A	-0.2	No	8.0	A	8.0	A	0	No

Table 8-4. 2031 plus Project Construction (Build Alternative with At-Grade Passenger Concourse) Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?	2031 (No Project)		2031 (with Project Construction)		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
26	Judge John Aiso Street/San Pedro Street and First Street	15.6	B	15.9	B	0.3	No	15.3	B	14.2	B	-1.1	No
27	Mission Road and Cesar Chavez Avenue	58.0	**E**	62.0	**E**	4	**Yes**	25.6	C	26.3	C	0.7	No
28	Mission Road and First Street	25.8	C	29.5	C	3.7	No	33.2	C	32.9	C	-0.3	No
29	Central Avenue and First Street	8.8	A	8.5	A	-0.3	No	11.3	B	12.2	B	0.9	No
30	Vignes Street and Bauchet Street	11.4	B	11.3	B	-0.1	No	20.0	B	19.1	B	-0.9	No
31	Ramirez Street and Center Street	1.7	A	1.6	A	-0.1	No	0.6	A	0.7	A	0.1	No
32	Union Station North Driveway and Cesar Chavez Avenue	13.6	B	13.6	B	0	No	14.0	B	14.0	B	0	No

Notes:

[a] ***Non-signalized intersection***

[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***

EB=eastbound; LOS=level of service; NA=not applicable; Sec=seconds; WB=westbound

8.4 2031 and 2040 plus Project Conditions

For 2031 and 2040, the proposed project and the build alternative would generate traffic in the vicinity of LAUS. As part of the early action/interim improvements that could be implemented as early as 2026, roadway modifications on Commercial Street and Center Street, to facilitate construction of the run-through track infrastructure south of LAUS, would occur. In consideration of the potential mitigation required for traffic-related and land-use-related impacts, the reduction of one vehicular lane in the westbound direction of Commercial Street from Garey Street to Alameda Street and addition of a bicycle lane is also included in the traffic impact evaluation. For 2031 and 2040, this improvement is assumed to be in place because it affects the traffic impact evaluation.

The following safety improvements are proposed along US-101 as part of this project, and would also be in place in the 2031 and 2040 conditions:

- US-101 Main line:
    - Increased median width and shoulder widths for enhanced horizontal clearance
    - Increased horizontal stopping sight distance
    - Restriping main line for enhanced curvature
    - Increased lane widths
    - Increased weaving distance with maximized lengths between southbound Los Angeles Street on-ramp and southbound Commercial Street off-ramp
    - Increased tangent length between reversing curves for improved drivability (greater distance between curves allows the driver to see the upcoming horizontal curve, prepare for the curve ahead, and adjust driving/steering accordingly)
- Alameda Street Off-Ramp (northbound):
    - Increased deceleration length
    - Standard ramp exit with diverge angle (provides a safety zone for drivers making last-minute decisions)
    - Increased shoulder width for enhanced horizontal clearance
- Commercial Street Off-Ramp and On-Ramp (southbound):
    - Increased shoulder widths for enhanced horizontal clearance

Additionally, the project includes safety improvements at the Main Street at-grade crossing to facilitate future implementation of a quiet zone by the City of Los Angeles. The implementation of a quiet zone is subject to review and approval by the California Public Utilities Commission. North of CP Chavez, the project would include the following safety improvements:

- An 8-foot-wide median on Main Street extending up to 100 feet on either side of the tracks
- Restriping to accommodate the median
- New signals with advance flashing beacons
- Wire mesh fencing along the rail ROW
- Replacement of the existing single-gate system with pedestrian and vehicular gate systems
- Pedestrian crossing arms and swing gates
- Modification to the west bridge wingwalls to accommodate pedestrian access

ADA-compliant improvements would include bulb-outs with curb ramps and a striped crosswalk at a driveway on the north side of Main Street, and an approximately 25-foot sidewalk with curb and gutter east of the driveway.

Intersection peak hour LOS for 2031 plus project condition is presented in Table 8-5, and Appendix L presents the Synchro worksheets for each study intersection. When compared to the 2031 no project condition, the following intersections are likely to be impacted due to implementation of the proposed project or the build alternative:

- Intersection #2: Garey Street and Commercial Street (AM and PM peaks)
- Intersection #4: Center Street and Commercial Street (AM and PM peaks)

Intersection peak hour LOS for 2040 plus project conditions is presented in Table 8-6, and Appendix L presents the Synchro worksheets for each study intersection. When compared to the 2040 no project conditions, the same two intersections would likely to be impacted due to implementation of the proposed project or the build alternative:

- Intersection #2: Garey Street and Commercial Street (AM and PM peaks)
- Intersection #4: Center Street and Commercial Street (AM and PM peaks)

8.4.1 Impacts of Construction-Related Traffic on US-101 Main line

The proposed project or the build alternative would generate additional construction traffic on US-101, thereby increasing the traffic volumes for both the AM and PM peak hours. As discussed in Section 7.4.2, all existing traffic lanes along the El Monte Busway and US-101 would be maintained during the peak hour throughout construction of run-through track infrastructure, although short-term overnight closures of the El Monte Busway, the US-101 main line, and the southbound ramps at Commercial Street would be

necessary to erect and dismantle falsework during construction of the US-101 viaduct. The US-101 main line would be closed temporarily during the night (10:00 PM to 6:00 AM) in one direction at a time during construction of the bridge superstructure. These night closures are expected to last up to 20-consecutive days. The southbound ramps at Commercial Street may either be partially or fully restricted for extended periods during construction of the US-101 viaduct over the existing on- and off-ramps.

For the US-101, the threshold for determining a significant impact is when a project increases the traffic demand by 2 percent of the capacity (D/C greater than or equal to 0.02). The volumes are affected on the northbound side during both AM and PM peak hours. During the 2031 plus project construction condition, northbound US-101 operates at LOS F(3) during both AM and PM peak hours. Southbound US-101 operates at LOS F(0) and LOS F(3) during the AM and PM peak hours, respectively. Table 8-7 summarizes the freeway main line D/C ratio and LOS during 2031 plus project construction condition. As shown in Table 8-7, the freeway operates at deficient LOS during both peak hours in both directions but does not exceed the threshold for significant impact. Therefore, the freeway would be impacted during construction but the impacts are not significant, and it is considered to be a short-term. These impacts would be minimized by closures during the off-peak hours and detours during the peak hours, as stated in the transportation management plan.

8.4.2 Impacts of Project-Related Traffic on US-101 Main line

The existing US-101 has a 30- to 40-foot-wide center median that would accommodate the support piers for the new run-through track structure over US-101. The final run-through track structure pier location would be determined during the final design phase. Traffic handling would be determined in accordance with the final design. As discussed above, the US-101 on- and off-ramps are assumed to remain in place through 2040.

During 2031 no project and plus project conditions, northbound US-101 operates at LOS F(3) during both AM and PM peak hours. Southbound US-101 operates at LOS F(0) and F(3) during the AM and PM peak hours, respectively. Table 8-8 summarizes the freeway main line LOS during 2031 no project and plus project conditions.

During 2040 no project and plus project conditions, northbound US-101 operates at LOS F(3) during both AM and PM peak hours. Southbound US-101 operates at LOS F(0) and F(3) during the AM and PM peak hours, respectively. Table 8-9 summarizes the freeway main line LOS during 2040 no project and plus project conditions.

8.5 Intersection Traffic Mitigation Measures

8.5.1 Construction

For the proposed project with an above-grade passenger concourse with new expanded passageway, the following three intersections would experience significant impacts per LADOT Guidelines (LADOT 2016) during construction:

- Intersection # 2: Garey Street and Commercial Street
- Intersection #10: Alameda Street and Los Angeles Street EB
- Intersection #15: Vignes Street and Main Street

The traffic impact analysis determined the following five intersections would experience significant impacts per LADOT Guidelines (LADOT 2016) during construction of the build alternative with an at-grade passenger concourse:

- Intersection # 1: Alameda Street and Commercial Street
- Intersection # 2: Garey Street and Commercial Street
- Intersection # 10: Alameda Street and Los Angeles Street EB
- Intersection #15: Vignes Street and Main Street
- Intersection #27: Mission Road and Cesar Chavez Avenue

According to LADOT Guidelines (LADOT 2016), these intersections would require mitigation. Mitigation measures are discussed in Section 12.0, although the optimizations and potential for reduced impacts are discussed herein. Changes to signal phasing and timing would mitigate the temporary impacts of traffic shifts caused by the construction detour. In addition to the signal phasing and timing, temporary closed-circuit television cameras would also mitigate temporary impacts by allowing for real-time monitoring of traffic during construction. Proposed locations of the closed-circuit television would need to be coordinated with the City of Los Angeles. Proposed changes to signal phasing and timing are identified at the following intersections:

- Intersection #1: Alameda Street and Commercial Street
    - Optimized intersection cycle lengths and splits to 60 seconds and 100 seconds during AM and PM peaks, respectively
- Intersection #2: Garey Street and Commercial Street
    - Optimized intersection cycle lengths and splits to 70 seconds and 90 seconds during AM and PM peaks, respectively
- Intersection #10: Alameda Street and Los Angeles Street WB

  - Optimized intersection cycle lengths and splits to 60 seconds and 90 seconds during AM and PM peaks, respectively
- Intersection #15: Vignes Street and Main Street
  - Optimized intersection cycle lengths and splits to 75 seconds and 150 seconds during AM and PM peaks, respectively
- Intersection #27: Mission Road and Cesar Chavez Avenue
  - Optimized intersection cycle lengths and splits to 90 seconds during both AM and PM peaks

The proposed construction traffic management plan would further reduce the impacts of construction-related traffic on local intersections. A comparison of the intersections for 2031 plus project construction condition traffic with and without mitigation is presented in Table 8-10, and detailed Synchro analysis worksheets are presented in Appendix M.

Operations

The traffic impact analysis determined that the 2031 and 2040 plus project conditions would result in significant impacts on the two intersections below; hence, mitigation in the form of a traffic signal for Intersection #4: Center Street and Commercial Street is required.

- Intersection #2: Garey Street and Commercial Street
- Intersection #4: Center Street and Commercial Street

Due to limitations in the ROW, there are no feasible mitigation measures to minimize the operational traffic delay at Intersection #2: Garey Street and Commercial Street, and the project-related increased delays would continue to exceed LADOT Guidelines (LADOT 2016) in 2031 and 2040.

A comparison of the intersections for 2031 and 2040 plus project conditions traffic with and without mitigation is presented in Table 8-11 and Table 8-12, respectively. Detailed Synchro analysis worksheets are presented in Appendix L.

In addition to the above-mentioned mitigation measures, mitigation is also proposed in the form of transportation demand management improvements that may be implemented along Commercial Street. Based on the LADOT Guidelines (LADOT 2016), the City of Los Angeles encourages implementation of mitigation measures that would focus on minimizing the demand for trips by single-occupant vehicles through trip reduction strategies and encouraging other modes of transportation, such as public transit and bicycles. As mentioned previously, active transportation improvements, such as bicycle lanes along Commercial Street between Garey Street and Alameda Street are proposed to reduce significant impacts. These improvements would enhance non-motorized connectivity, facilitate a pedestrian and bicycle-friendly environment in the study area, and encourage the use of alternate modes of transportation, consistent with LADOT Guidelines (LADOT 2016) and Metro's Active Transportation Program.

Table 8-5. 2031 plus Project Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 No Project		2031 Plus Project		Delta		2031 No Project		2031 Plus Project		Delta	
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	Significant Impact?	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	Significant Impact?
1	Alameda Street and Commercial Street	29.1	C	29.5	C	0.4	No	35.1	D	35.4	D	0.3	No
2	Garey Street and Commercial Street	31.3	C	62.9	**E**	31.6	**Yes**	34.1	C	62.9	**E**	28.8	**Yes**
3	Vignes Street and Commercial Street [a]	9.8	A	NA	NA	NA	NA	10.1	B	NA	NA	NA	NA
4	Center Street and Commercial Street [a]	17.2	C	83.0	**F**	65.8	**Yes**	57.5	**F**	157.4	**F**	99.9	**Yes**
5	Alameda Street and Temple Street	14.6	B	14.7	B	0.1	No	16.7	B	15.8	B	-0.9	No
6	Vignes Street and Temple Street [a]	15.4	C	15.4	C	0.0	No	9.9	A	9.9	A	0	No
7	Alameda Street and First Street	18.3	B	18.3	B	0.0	No	17.3	B	17.9	B	0.6	No
8	Vignes Street and First Street	20.2	C	20.2	C	0.0	No	27.6	C	27.5	C	-0.1	No
9	Alameda Street and El Monte Busway/Arcadia Street	21.1	C	21.2	C	0.1	No	14.6	B	14.5	B	-0.1	No
10	Alameda Street and Los Angeles Street EB	12.1	B	11.7	B	-0.4	No	12.4	B	12.6	B	0.2	No
110	Alameda Street and Los Angeles Street WB	4.3	A	4.4	A	0.1	No	5.7	A	7.0	A	1.3	No
11	Alameda Street and Cesar Chavez Avenue	20.7	C	20.9	C	0.2	No	17.1	B	16.9	B	-0.2	No
12	Alameda Street and Vignes Street/Alpine Street	11.6	B	13.7	B	2.1	No	13.8	B	18.1	B	4.3	No
13	Vignes Street and Cesar Chavez Avenue	18.5	B	19.9	B	1.4	No	25.1	C	25.9	C	0.8	No
14	Vignes Street and Ramirez Street	23.3	C	23.4	C	0.1	No	24.5	C	24.8	C	0.3	No
15	Vignes Street and Main Street	27.2	C	17.6	B	-9.6	No	74.6	**E**	50.7	D	-23.9	No
16	Alameda Street/Spring Street and College Street	16.5	B	16.5	B	0.0	No	17.7	B	17.9	B	0.2	No
17	Alameda Street and Main Street/Ord Street [a]	0.7	A	0.7	A	0.0	No	0.7	A	0.7	A	0	No
18	Alameda Street and Main Street/Bauchet Street	5.8	A	5.7	A	-0.1	No	9.6	A	9.8	A	0.2	No
19	Main Street and Cesar Chavez Avenue	7.7	A	7.7	A	0.0	No	19.8	B	19.8	B	0	No
20	Alameda Street and Northbound US-101 [b]	—	—	—	—	—	—	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	7.7	A	7.8	A	0.1	No	4.8	A	5.1	A	0.3	No
22	Los Angeles Street and Aliso Street	9.4	A	9.5	A	0.1	No	11.8	B	11.7	B	-0.1	No
23	Los Angeles Street and Temple Street	15.2	B	15.2	B	0.0	No	17.6	B	17.6	B	0	No
24	Los Angeles Street and First Street	15.2	B	15.2	B	0.0	No	20.7	C	20.7	C	0	No
25	Judge John Aiso Street and Temple Street	8.3	A	8.2	A	-0.1	No	8.0	A	7.7	A	-0.3	No

Table 8-5. 2031 plus Project Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2031 No Project		2031 Plus Project		Delta	Significant Impact?	2031 No Project		2031 Plus Project		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
26	Judge John Aiso Street/San Pedro Street and First Street	15.6	B	15.6	B	0.0	No	15.3	B	15.3	B	0	No
27	Mission Road and Cesar Chavez Avenue	58.0	**E**	58.1	**E**	0.1	No	25.6	C	25.7	C	0.1	No
28	Mission Road and First Street	25.8	C	25.8	C	0.0	No	33.2	C	33.2	C	0	No
29	Central Avenue and First Street	8.8	A	8.8	A	0.0	No	11.3	B	11.3	B	0	No
30	Vignes Street and Bauchet Street	11.4	B	11.1	B	-0.3	No	20.0	B	20.0	B	0	No
31	Ramirez Street and Center Street	1.7	A	1.7	A	0.0	No	0.6	A	0.6	A	0	No
32	Union Station North Driveway and Cesar Chavez Avenue	13.6	B	13.6	B	0.0	No	14.0	B	14.0	B	0	No

Notes:
a Non-signalized intersection
b Freeway on-ramp, neither signalized nor STOP-sign controlled
EB=eastbound; LOS=level of service; NA=not applicable; Sec=seconds; WB=westbound

Table 8-6. 2040 plus Project Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2040 No Project		2040 Plus Project		Delta	Significant Impact?	2040 No Project		2040 Plus Project		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
1	Alameda Street and Commercial Street	31.6	C	32.0	C	0.4	No	47.8	D	49.2	D	1.4	No
2	Garey Street and Commercial Street	31.3	C	55.5	D	24.2	**Yes**	34.6	C	42.3	D	7.7	**Yes**
3	Vignes Street and Commercial Street [a]	9.8	A	NA	NA	NA	NA	10.2	B	NA	NA	NA	NA
4	Center Street and Commercial Street [a]	18.0	C	90.7	**F**	72.7	**Yes**	62.5	**F**	166.5	**F**	104	**Yes**
5	Alameda Street and Temple Street	16.3	B	16.3	B	0	No	16.9	B	16.9	B	0	No
6	Vignes Street and Temple Street [a]	15.9	C	15.9	C	0	No	10	A	10	A	0	No
7	Alameda Street and First Street	18.5	B	18.5	B	0	No	16.2	B	16.2	B	0	No
8	Vignes Street and First Street	21.1	C	21.1	C	0	No	26.9	C	26.6	C	-0.3	No
9	Alameda Street and El Monte Busway/Arcadia Street	90.3	**F**	90.0	**F**	0	No	15.7	B	15.6	B	-0.1	No
10	Alameda Street and Los Angeles Street EB	28.0	C	28.1	A	0.1	No	15.5	B	14.2	B	-1.3	No
110	Alameda Street and Los Angeles Street WB	0.1	A	0.1	A	0	No	0.2	A	0.2	A	0	No
11	Alameda Street and Cesar Chavez Avenue	29.7	C	29.7	C	0	No	21.1	C	21.2	C	0.1	No
12	Alameda Street and Vignes Street/Alpine Street	12.5	B	12.5	B	0	No	14.4	B	14.5	B	0.1	No
13	Vignes Street and Cesar Chavez Avenue	18.1	B	18.1	B	0	No	21	C	21.1	C	0.1	No
14	Vignes Street and Ramirez Street	23.3	C	23.3	C	0	No	26	C	25.9	C	-0.1	No
15	Vignes Street and Main Street	18.8	B	18.8	B	0	No	62.8	**E**	63.8	**E**	1	No
16	Alameda Street/Spring Street and College Street	16.8	B	16.8	B	0	No	16.8	B	17.1	B	0.3	No
17	Alameda Street and Main Street/Ord Street [a]	0.7	A	0.7	A	0	No	0.7	A	0.7	A	0	No
18	Alameda Street and Main Street/Bauchet Street	5.3	A	5.3	A	0	No	14	B	14.3	B	0.3	No
19	Main Street and Cesar Chavez Avenue	7.1	A	7.1	A	0	No	19.6	B	19.4	B	-0.2	No
20	Alameda Street and Northbound US-101 [b]	—	—	—	—	—	—	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	8.9	A	9.0	A	0.1	No	5.9	A	6	A	0.1	No
22	Los Angeles Street and Aliso Street	10.1	B	10.2	B	0.1	No	12.1	B	12.2	B	0.1	No
23	Los Angeles Street and Temple Street	15.1	B	15.1	B	0	No	18	B	18	B	0	No
24	Los Angeles Street and First Street	14.1	B	14.1	B	0	No	21.9	C	21.9	C	0	No
25	Judge John Aiso Street and Temple Street	7.8	A	7.8	A	0	No	8.2	A	8.1	A	-0.1	No
26	Judge John Aiso Street/San Pedro Street and First Street	16.1	B	16.1	B	0	No	15.4	B	15.3	B	-0.1	No
27	Mission Road and Cesar Chavez Avenue	59.7	**E**	59.7	**E**	0	No	26.6	C	26.6	C	0	No
28	Mission Road and First Street	26.9	C	26.9	C	0	No	36.9	D	36.9	D	0	No
29	Central Avenue and First Street	9.1	A	9.1	A	0	No	11.4	B	11.3	B	-0.1	No

Table 8-6. 2040 plus Project Intersection Level of Service

Intersection	Intersection	AM Peak						PM Peak					
		2040 No Project		2040 Plus Project		Delta	Significant Impact?	2040 No Project		2040 Plus Project		Delta	Significant Impact?
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	
30	Vignes Street and Bauchet Street	11.8	B	11.9	B	0.1	No	20.9	C	20.5	C	-0.4	No
31	Ramirez Street and Center Street	1.8	A	1.7	A	0	No	0.7	A	0.7	A	0	No
32	Union Station North Driveway and Cesar Chavez Avenue	13.0	B	13.0	B	0	No	14.1	B	14.1	B	0	No

Notes:

[a] ***Non-signalized intersection***

[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***

EB=eastbound; LOS=level of service; NA=not applicable; Sec=second; WB=westbound

Table 8-7. 2031 plus Construction Freeway Main line Level of Service

Freeway Analysis Location	Peak	Northbound				Southbound			
		Demand	Capacity	D/C	LOS	Demand	Capacity	D/C	LOS
US-101 North of Vignes Street	AM	13,549	8,000	1.69	F(3)	9,152	8,000	1.14	F(0)
PM 0.45	PM	13,179	8,000	1.65	F(3)	13,506	8,000	1.69	F(3)

Notes:
D/C=demand to capacity; LOS=level of service; PM=post mile

Table 8-8. 2031 Freeway Main line Level of Service

Freeway Analysis Location	Peak	Northbound				Southbound			
		Demand	Capacity	D/C	LOS	Demand	Capacity	D/C	LOS
No Project Condition									
US-101 North of Vignes Street	AM	13,298	8,000	1.66	F(3)	9,150	8,000	1.14	F(0)
PM 0.45	PM	13,176	8,000	1.65	F(3)	13,420	8,000	1.68	F(3)
Plus Project Condition									
US-101 North of Vignes Street	AM	13,300	8,000	1.66	F(3)	9,150	8,000	1.14	F(0)
PM 0.45	PM	13,188	8,000	1.65	F(3)	13,420	8,000	1.68	F(3)

Notes:
D/C=demand to capacity; LOS=level of service; PM=post mile

Table 8-9. 2040 Freeway Main line Level of Service

Freeway Analysis Location	Peak	Northbound				Southbound			
		Demand	Capacity	D/C	LOS	Demand	Capacity	D/C	LOS
No Project Condition									
US-101 North of Vignes Street	AM	14,279	8,000	1.78	F(3)	9,825	8,000	1.23	F(0)
PM 0.45	PM	14,148	8,000	1.77	F(3)	14,410	8,000	1.80	F(3)
Plus Project Condition									
US-101 North of Vignes Street	AM	14,281	8,000	1.79	F(3)	9,825	8,000	1.23	F(0)
PM 0.45	PM	14,160	8,000	1.77	F(3)	14,410	8,000	1.80	F(3)

Notes:
D/C=demand to capacity; LOS=level of service; PM=post mile

Table 8-10. 2031 Construction Condition with and without Mitigation Level of Service

Intersection	Intersection	AM Peak					PM Peak				
		2028 with Construction		2028 Construction with Mitigation		Delta	2028 with Construction		2028 Construction with Mitigation		Delta
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)
1	Alameda Street and Commercial Street	34.0	C	19.8	B	-14.2	39.1	D	33.5	C	-5.6
2	Garey Street and Commercial Street	59.6	**E**	34.3	C	-25.3	37.5	D	35.8	D	-1.7
10	Alameda Street and Los Angeles Street WB	12.5	B	6.4	A	-6.1	31.1	C	16.2	B	-14.9
15	Vignes Street and Main Street	24.9	C	19.3	B	-5.6	89.1	**F**	76.7	**E**	-12.4
27	Mission Road and Cesar Chavez Avenue	60.3	**E**	54.1	D	-6.2	26.0	C	25.7	C	-0.3

Notes:
LOS=level of service; Sec=seconds; WB=westbound

Table 8-11. 2031 plus Project with and without Mitigation Level of Service

Intersection	Intersection	AM Peak					PM Peak				
		2031 plus Project		2031 plus Project with Mitigation		Delta	2031 plus Project		2031 plus Project with Mitigation		Delta
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)
4	Center Street and Commercial Street	83.0	**F**	13.2	B	-69.8	157.4	**F**	15.0	B	-142.4

Notes:
LOS=level of service; Sec=seconds

Table 8-12. 2040 plus Project with and without Mitigation Level of Service

Intersection	Intersection	AM Peak					PM Peak				
		2040 plus Project		2040 plus Project with Mitigation		Delta	2040 plus Project		2040 plus Project with Mitigation		Delta
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)
4	Center Street and Commercial Street	90.7	**F**	13.7	B	-77	166.5	**F**	15.5	B	-151

Notes:
LOS=level of service; Sec=seconds

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9.0 Congestion Management Program Transportation Impact Analysis

9.1 Congestion Management Program Traffic Impact Analysis

Following are CMP monitoring locations closest to the project study area:

- Alameda Street and Washington Boulevard (a CMP arterial monitoring intersection)
- Alvarado Street and Sunset Boulevard (a CMP arterial monitoring intersection)
- Wilshire Boulevard and Alvarado Street (a CMP arterial monitoring intersection)
- US-101 north of Vignes Street (a CMP freeway monitoring location)

The traffic projections from Section 7.0, Future Traffic Predictions and Roadway Characteristics, were used to determine the locations where project-related trips might exceed these thresholds.

Based on the project trip assignments that were developed, the project is not expected to add traffic to exceed the arterial intersection analysis criteria or the freeway analysis criteria at the nearest monitoring locations or at any location. Since project traffic during either AM or PM peak hours is projected to be less than the minimum criteria of 50 vehicles per hour for arterial intersections and 150 vehicles per hour for freeway locations, no further analysis of CMP arterial monitoring intersections or freeway monitoring locations is required.

9.2 Congestion Management Program Transit Impact Analysis

Per the CMP, project-related impacts on public transit services would be considered significant if the proposed project or the build alternative resulted in a substantial increase in ridership on the existing public transit system, creating capacity shortages on the system and thereby necessitating system improvements to accommodate additional transit service.

The project would facilitate a substantial increase in rail operational capacity for the region, reduced train idling time at LAUS, and improved on-time performance for trains using LAUS. The project would also contribute indirectly to other cumulative benefits for the region, including a regional reduction of VMT and associated greenhouse gases, as demonstrated by the operational analysis provided in the *2016 Regional Transportation Plan/Sustainable Communities Strategy Environmental Impact Report* (see Program EIR Table 3.3.4-4; SCAG 2016). While the project would provide the largest possible "operating envelope" to increase capacity within the existing station footprint, future service scenarios would depend on ongoing negotiations between the railroad operators, available infrastructure (e.g., corridor, maintenance facility), and available operating funding. The project, by itself, does not enable regional/intercity rail providers to meet their service goals, primarily because other infrastructure improvements on the entire system are required to meet the forecasted service levels by 2040; however, the project is a critical component to

providing capacity enhancements to fulfill the statewide mandates and regional objectives. Therefore, no significant impacts on the transit system are anticipated.

10.0 Signal Warrant Analysis

Peak hour signal warrant analysis was conducted at Intersection #4: Center Street and Commercial Street for the 2031 and 2040 Conditions. As shown in Table 10-1 to Table 10-4, peak hour signal warrant is met at Intersection #4: Center Street and Commercial Street in the 2031 and 2040 Conditions.

Appendix N presents the peak hour signal warrant worksheets.

Table 10-1. 2031 No Project Conditions Signal Warrant Analysis

Intersection Number	Intersection Name	Peak Hour Warrant Satisfied?	
		AM	PM
4	Center Street and Commercial Street	Yes	Yes

Table 10-2. 2031 plus Project Conditions Signal Warrant Analysis

Intersection Number	Intersection Name	Peak Hour Warrant Satisfied?	
		AM	PM
4	Center Street and Commercial Street	Yes	Yes

Table 10-3. 2040 No Project Conditions Signal Warrant Analysis

Intersection Number	Intersection Name	Peak Hour Warrant Satisfied?	
		AM	PM
4	Center Street and Commercial Street	Yes	Yes

Table 10-4. 2040 plus Project Conditions Signal Warrant Analysis

Intersection Number	Intersection Name	Peak Hour Warrant Satisfied?	
		AM	PM
4	Center Street and Commercial Street	Yes	Yes

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11.0 On-Street Parking Impact Analysis

On-street parking availability and impacts during construction and operation were considered as part of this traffic analysis. Locations where encroachment on public parking spaces may occur were identified and the number of on-street parking spaces that might be affected were estimated from field observations and aerial research.

Existing on-street parking in the project study area was inventoried in September 2014. A total of 274 general spaces and 12 loading spaces were identified. Most parking within the study area is metered (242 spaces). The meters and a 10-hour parking limit are effective weekdays between 6:00 AM and 4:00 PM.

During construction of the run-through track infrastructure, the proposed project or the build alternative would directly impact eight parking spaces on the south side of Commercial Street between Vignes Street and Center Street. Additionally, two loading spaces in the north side of Commercial Street east of Center Street would be impacted. The uses these parking spaces serve would be eliminated as part of the Commercial Street realignment and therefore would have no impacts. The south side of Commercial Street between Alameda Street and Vignes Street is signed to prohibit parking; therefore, there are no existing parking spaces along this segment to be impacted. Parking along Bolero Lane may also be affected temporarily during construction of the lead tracks and supporting retaining wall associated with the proposed project or the build alternative.

Throughout operations, up to ten parking spaces may be impacted within the William Mead Homes Complex upon implementation of the build alternative.

Table 11-1 summarizes the number of existing and impacted parking spaces on Commercial Street, Ducommun Street, Jackson Street, Temple Street, Hewitt Street, Garey Street, Vignes Street, Center Street, and Bolero Lane.

Table 11-1. Existing and Potentially Impacted On-Street Parking

Location	Existing Parking Spaces			Potential Affected Parking Spaces		
	Metered	Open	Loading	Metered	Open	Loading
Commercial Street (between Alameda Street and east of Center Street)	8	0	0	8	0	0
Commercial Street (east of Center Street)	0	0	3	0	0	2
Ducommun Street (between Alameda Street and east of Center Street)	79	8	2	0	0	0

Table 11-1. Existing and Potentially Impacted On-Street Parking

Location	Existing Parking Spaces			Potential Affected Parking Spaces		
	Metered	Open	Loading	Metered	Open	Loading
Jackson Street (between Alameda Street and east of Center Street)	32	0	0	0	0	0
Temple Street (between Alameda Street and east of Center Street)	19	0	5	0	0	0
Hewitt Street (between Commercial Street and Ducommun Street)	14	0	0	0	0	0
Garey Street (between Commercial Street and Temple Street)	27	0	0	0	0	0
Vignes Street (between Commercial Street and First Street)	51	0	2	0	0	0
Center Street (between Commercial Street and Temple Street)	13	0	0	0	0	0
Bolero Lane (between Bloom Street and Leroy Street)	0	24	0	0	10	0
Total	**243**	**32**	**12**	**8**	**10**	**2**

Source: FPL and Associates 2014

12.0 Conclusion

This traffic impact assessment was undertaken to analyze potential traffic and parking impacts of the proposed project and the build alternative. A summary of the 2031 and 2040 intersections LOS is shown in Table 12-1. The following summarizes the key findings of the study.

12.1 Construction

During construction of the project, the east and west legs of the Center Street and Commercial Street intersection would be closed at times while one lane of traffic in both directions of Center Street would be maintained. Detouring would be necessary, which would affect the other study intersections in the area. However, all impacts can be mitigated as discussed in Section 8.5.

In the 2031 plus project construction condition (proposed project with an above-grade passenger concourse with new expanded passageway), the following intersections are significantly impacted:

- Intersection #2: Garey Street and Commercial Street (AM and PM peaks)
- Intersection #10: Alameda Street and Los Angeles Street EB (PM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)

In the 2031 plus project construction condition (build alternative with an at-grade passenger concourse), the following intersections are significantly impacted:

- Intersection #1: Alameda Street and Commercial Street (PM peak)
- Intersection #2: Garey Street and Commercial Street (AM peak)
- Intersection #10: Alameda Street and Los Angeles Street EB (PM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

The project would reduce the number of available parking spaces on Commercial Street (between Alameda Street and Center Street) and Bolero Lane (between Bloom Street and Leroy Street) during construction closures as well as after completion of project-related improvements.

12.2 Operation

12.2.1 Existing Condition (2016)

All study intersections operate within LADOT-recommended acceptable LOS thresholds. Most intersections operate at LOS C or better during both peak hours, except the following intersections:

- Intersection #4: Center Street and Commercial Street (PM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

Northbound US-101 operates at LOS F(2) and F(1) during AM and PM peak hours, respectively. Southbound US-101 operates at LOS E and F(2) during AM and PM peak hours, respectively.

12.2.2 2031 Conditions

Two intersections are significantly impacted by project-related traffic in the 2031 plus project condition due to operational traffic delay and would continue to exceed LADOT Guidelines (LADOT 2016).

- Intersection #2: Garey Street and Commercial Street (AM and PM peaks)
- Intersection #4: Center Street and Commercial Street (AM and PM peaks)

All study intersections operate at LOS D or better in the 2031 no project condition except the following intersections:

- Intersection #4: Center Street and Commercial Street (PM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

All study intersections operate at LOS D or better in the year 2031 plus project condition except the following intersections:

- Intersection #4: Center Street and Commercial Street (AM and PM peaks)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

During 2031, northbound US-101 operates at LOS F(3) during both AM and PM peak hours. Southbound US-101 operates at LOS F(0) and F(3) during AM and PM peak hours, respectively. These levels of service apply to both 2031 no project and 2031 plus project conditions.

12.2.3 2040 Conditions

Two intersections are significantly impacted by project-related traffic in the 2040 plus project condition due to operational traffic delay and would continue to exceed LADOT Guidelines (LADOT 2016).

- Intersection #2: Garey Street and Commercial Street (AM and PM peaks)
- Intersection #4: Center Street and Commercial Street (AM and PM peaks)

The majority of the study intersections operate at LOS D or better in the 2040 no project condition. The following intersections operate at LOS E or F during peak hours:

- Intersection #4: Center Street and Commercial Street (PM peak)
- Intersection #9: Alameda Street and El Monte Busway/Arcadia Street (AM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

The majority of the study intersections operate at LOS D or better under 2040 plus project condition. The following intersections operate at LOS E or F during peak hours:

- Intersection #4: Center Street and Commercial Street (AM and PM peaks)
- Intersection #9: Alameda Street and El Monte Busway/Arcadia Street (AM peak)
- Intersection #15: Vignes Street and Main Street (PM peak)
- Intersection #27: Mission Road and Cesar Chavez Avenue (AM peak)

During 2040, northbound US-101 operates at LOS F(3) during both AM and PM peak hours. Southbound US-101 operates at LOS F(0) and F(3) during AM and PM peak hours, respectively. These levels of service apply to both 2040 no project and 2040 plus project conditions.

The project would not significantly impact the CMP arterial, freeway, or transit networks.

12.3 Mitigation

The significant impacts identified during construction shall be mitigated using temporary measures such as signing and maintenance of traffic strategies, adjusting the signal timing at the affected intersections, providing alternate routes for commuter traffic, and installing the closed circuit television cameras. A detailed construction traffic management plan (short-term construction impacts) shall be prepared during the final engineering phase of the project and shall be approved by the City of Los Angeles and California Department of Transportation at least 30 days prior to construction.

The significant impacts identified under 2031 and 2040 plus project conditions shall be mitigated using measures such as traffic signal installation and adjusting the signal timing at affected intersections.

Transportation Demand Management improvements such as a dedicated pedestrian/bicycle bridge, or bicycle lanes along Commercial Street between Garey Street and Alameda Street is also considered as a mitigation measure as per the LADOT Traffic Impact Study Guidelines.

Table 12-1. Level of Service Summary

Intersection	Intersection	2031 No Project						2031 Plus Project						2040 No Project						2040 Plus Project					
		AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
1	Alameda Street and Commercial Street	29.1	0.57	C	35.1	0.86	D	29.5	0.58	C	35.4	0.87	D	31.6	0.62	C	47.8	0.98	D	32.0	0.63	C	49.2	0.99	D
2	Garey Street and Commercial Street	31.3	0.39	C	34.1	0.49	C	62.9	0.63	**E**	62.9	0.73	**E**	31.3	0.39	C	34.6	0.49	C	55.5	0.65	**E**	42.3	0.73	D
3	Vignes Street and Commercial Street [a]	9.8	0.39	A	10.1	0.40	B	NA	NA	NA	NA	NA	NA	9.8	0.39	A	10.2	0.41	B	NA	NA	NA	NA	NA	NA
4	Center Street and Commercial Street [a]	17.2	0.71	C	57.5	1.18	**F**	83.0	1.27	**F**	157.4	1.62	**F**	18.0	0.73	C	62.5	1.22	**F**	90.7	1.3	**F**	166.5	1.65	**F**
5	Alameda Street and Temple Street	14.6	0.67	B	16.7	0.74	B	14.7	0.68	B	15.8	0.75	B	16.3	0.69	B	16.9	0.75	B	16.3	0.69	B	16.9	0.77	B
6	Vignes Street and Temple Street [a]	15.4	0.72	C	9.9	0.42	A	15.4	0.72	C	9.9	0.42	A	15.9	0.73	C	10	0.43	A	15.9	0.73	C	10	0.43	A
7	Alameda Street and First Street	18.3	0.54	B	17.3	0.61	B	18.3	0.55	B	17.9	0.63	B	18.5	0.55	B	16.2	0.63	B	18.5	0.56	B	16.2	0.64	B
8	Vignes Street and First Street	20.2	0.51	C	27.6	0.59	C	20.2	0.51	C	27.5	0.59	C	21.1	0.51	C	26.9	0.59	C	21.1	0.51	C	26.6	0.59	C
9	Alameda Street and El Monte Busway/Arcadia Street	21.1	0.88	C	14.6	0.62	B	21.2	0.88	C	14.5	0.62	B	90.3	0.89	**F**	15.7	0.69	B	90.0	0.90	**F**	15.6	0.69	B
10	Alameda Street and Los Angeles Street EB[a]	12.1	0.32	B	12.4	0.34	B	11.7	0.33	B	12.6	0.35	B	28.0	0.65	C	15.5	0.59	B	28.1	0.66	C	14.2	0.62	B
110	Alameda Street and Los Angeles Street WB[a]	4.3	0.34	A	5.7	0.30	A	4.4	0.34	A	7.0	0.33	A	0.1	0.45	A	0.2	0.31	A	0.1	0.45	A	0.2	0.32	A
11	Alameda Street and Cesar Chavez Avenue	20.7	0.77	C	17.1	0.69	B	20.9	0.77	C	16.9	0.69	B	29.7	0.87	C	21.1	0.75	C	29.7	0.87	C	21.2	0.75	C
12	Alameda Street and Vignes Street/Alpine Street	11.6	0.58	B	13.8	0.62	B	13.7	0.58	B	18.1	0.62	B	12.5	0.59	B	14.4	0.63	B	12.5	0.59	B	14.5	0.63	B
13	Vignes Street and Cesar Chavez Avenue	18.5	0.78	B	25.1	0.86	C	19.9	0.78	B	25.9	0.86	C	18.1	0.79	B	21	0.88	C	18.1	0.79	B	21.1	0.88	C
14	Vignes Street and Ramirez Street	23.3	0.43	C	24.5	0.53	C	23.4	0.43	C	24.8	0.54	C	23.3	0.43	C	26	0.54	C	23.3	0.43	C	25.9	0.55	C
15	Vignes Street and Main Street	27.2	0.59	C	74.6	1.01	**E**	17.6	0.60	B	50.7	0.99	D	18.8	0.6	B	62.8	1.04	**E**	18.8	0.6	B	63.8	1.07	**E**
16	Alameda Street/Spring Street and College Street	16.5	0.61	B	17.7	0.71	B	16.5	0.62	B	17.9	0.71	B	16.8	0.63	B	16.8	0.73	B	16.8	0.63	B	17.1	0.73	B
17	Alameda Street and Main Street/Ord Street [a]	0.7	0.34	A	0.7	0.41	A	0.7	0.34	A	0.7	0.41	A	0.7	0.35	A	0.7	0.42	A	0.7	0.35	A	0.7	0.42	A
18	Alameda Street and Main Street/Bauchet Street	5.8	0.42	A	9.6	0.57	A	5.7	0.42	A	9.8	0.58	A	5.3	0.42	A	14	0.6	B	5.3	0.42	A	14.3	0.6	B
19	Main Street and Cesar Chavez Avenue	7.7	0.44	A	19.8	0.64	B	7.7	0.44	A	19.8	0.64	B	7.1	0.45	A	19.6	0.67	B	7.1	0.45	A	19.4	0.67	B
20	Alameda Street and Northbound US-101[b]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21	Los Angeles Street and Arcadia Street	7.7	0.59	A	4.8	0.52	A	7.8	0.59	A	5.1	0.52	A	8.9	0.62	A	5.9	0.44	A	9.0	0.62	A	6.0	0.44	A
22	Los Angeles Street and Aliso Street	9.4	0.30	A	11.8	0.61	B	9.5	0.30	A	11.7	0.62	B	10.1	0.3	B	12.1	0.64	B	10.2	0.3	B	12.2	0.64	B
23	Los Angeles Street and Temple Street	15.2	0.61	B	17.6	0.78	B	15.2	0.61	B	17.6	0.78	B	15.1	0.62	B	18	0.82	B	15.1	0.62	B	18	0.82	B

Table 12-1. Level of Service Summary

Intersection	Intersection	2031 No Project						2031 Plus Project						2040 No Project						2040 Plus Project					
		AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
		Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C	LOS
24	Los Angeles Street and First Street	15.2	0.55	B	20.7	0.90	C	15.2	0.55	B	20.7	0.90	C	14.1	0.56	B	21.9	0.97	C	14.1	0.56	B	21.9	0.97	C
25	Judge John Aiso Street and Temple Street	8.3	0.40	A	8.0	0.43	A	8.2	0.40	A	7.7	0.43	A	7.8	0.41	A	8.2	0.44	A	7.8	0.41	A	8.1	0.44	A
26	Judge John Aiso Street/San Pedro Street and First Street	15.6	0.44	B	15.3	0.66	B	15.6	0.44	B	15.3	0.66	B	16.1	0.45	B	15.4	0.67	B	16.1	0.45	B	15.3	0.67	B
27	Mission Road and Cesar Chavez Avenue	58.0	1.11	**E**	25.6	0.89	C	58.1	1.11	**E**	25.7	0.89	C	59.7	1.21	**E**	26.6	0.92	C	59.7	1.21	**E**	26.6	0.92	C
28	Mission Road and First Street	25.8	0.81	C	33.2	0.89	C	25.8	0.81	C	33.2	0.89	C	26.9	0.83	C	36.9	0.93	D	26.9	0.83	C	36.9	0.93	D
29	Central Avenue and First Street	8.8	0.33	A	11.3	0.49	B	8.8	0.33	A	11.3	0.49	B	9.1	0.33	A	11.4	0.5	B	9.1	0.33	A	11.3	0.5	B
30	Vignes Street and Bauchet Street	11.4	0.29	B	20.0	0.49	B	11.1	0.29	B	20.0	0.49	B	11.8	0.29	B	20.9	0.5	C	11.9	0.29	B	20.5	0.5	C
31	Ramirez Street and Center Street	1.7	0.24	A	0.6	0.35	A	1.7	0.2	A	0.6	0.35	A	1.8	0.21	A	0.7	0.36	A	1.7	0.28	A	0.7	0.37	A
32	Union Station North Driveway and Cesar Chavez Avenue	13.6	0.54	B	14.0	0.51	B	13.6	0.54	B	14.0	0.51	B	13.0	0.54	B	14.1	0.52	B	13.0	0.54	B	14.1	0.53	B

Notes:
[a] ***Non-signalized intersection***
[b] ***Freeway on-ramp, neither signalized nor STOP-sign controlled***
EB=eastbound; NA=not applicable; LOS=level of service; Sec=Seconds; V/C=volume to capacity; WB=westbound

13.0 References

City of Los Angeles Department of Transportation (LADOT) 2016. Transportation Impact Study Guidelines. Bureau of Planning and Development Services. http://ladot.lacity.org/sites/g/files/wph266/f/COLA-TISGuidelines-010517.pdf

The Concord Group. 2016. Strategic Retail Programming Analysis for the Union Station Property in Downtown Los Angeles, CA. July 8, 2016.

Kaku Associates, Inc. 2003. *Traffic Engineering Analysis*. Prepared for the Los Angeles Union Station Run-through Tracks Project Environmental Impact Report/Environmental Impact Statement.

Los Angeles County Metropolitan Transportation Authority (Metro). 2015. *Connect US Action Plan* (formerly the Union Station and First/Central Station Linkages Study). https://www.metro.net/about/union-station/connect-us-action-plan/

Southern California Association of Governments (SCAG). 2016. *Regional Transportation Plan/ Sustainable Communities Strategy Environmental Impact Report*. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx

Transportation Research Board (TRB). 2010. *Highway Capacity Manual*, 5th edition. Washington, DC.

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