LINSCOTT LAW & GREENSPAN engineers

REVISED TRAFFIC IMPACT ANALYSIS REPORT
2555 W. 190TH STREET
WAREHOUSE/MANUFACTURING PROJECT

Torrance, California

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EXECUTIVE SUMMARY

Project Description

- The Project site is located at 2555 W. 190th Street in the City of Torrance, California. It is bounded by Crenshaw Boulevard/Crenshaw Place on to the west and by W. 190th Street to the south. The Project site is currently developed with an existing 160,000 SF office building that is currently vacant and has not been actively marketed pending the redevelopment of the subject property as proposed by the Project, in addition to excess surface parking areas.

- The proposed Project includes development of a state-of-the-art warehouse/cross dock industrial warehouse with 305,550 square-feet (SF) of floor area consisting of 86,780 SF of warehouse, 198,400 SF of manufacturing, and 20,370 SF of office, inclusive of 14,550 SF of mezzanine space. The Project would require demolition of the existing 160,000 SF office building. Parking for the Project, calculated at 1 space per 1500 SF for warehouse/storage space, 1 space per 400 SF of manufacturing, and 1 space per 250 SF of office space per Section 93.2.33 of the City's Municipal Code, will be provided via surface parking.

- Vehicular access to the Project site will be provided via the existing unsignalized full access driveway (Project Driveway 1) and signalized full access driveway (Project Driveway 2) located along W. 190th Street, a third unsignalized full access "gated access" driveway on Crenshaw Place (Project Driveway 3), and a fourth unsignalized driveway located on Crenshaw Place (Project Driveway 4) in close proximity to Crenshaw Boulevard.

- The existing office building has a trip generation potential of 1,558 daily trips, with 186 trips (160 inbound, 26 outbound) produced in the AM peak hour and 184 trips (29 inbound, 155 outbound) produced in the PM peak hour on an average weekday.

  The proposed Project, after applying passenger car equivalent (PCE) factors to the warehousing/manufacturing components, is forecast to generate approximately 1,417 weekday daily PCE trips, with 222 PCE trips (176 inbound, 46 outbound) produced in the AM peak hour and 253 PCE trips (75 inbound, 178 outbound) produced in the PM peak hour. Of the total trips generated by Project, truck trips related to the warehousing/manufacturing components are forecast total 478 weekday daily PCE trips, with 101 PCE trips produced in the AM peak hour and 135 PCE trips produced in the PM peak hour.

  A comparison of trips generated by the Project to the Existing Land Use indicates that the net trip generation for the proposed Project would result in 141 less daily trips, 36 more AM peak hour trips, and 69 more PM peak hour trips. However, since the existing office building is currently vacant, the existing trip credit will not be applied to the analysis to provide a conservative assessment.

- The twelve (12) key area intersections selected for evaluation in this report, all of which are located within the City of Torrance, provide local and regional access to the study area. They consist of the following:

1. Crenshaw Boulevard at W. 182nd Street (Torrance)
2. I-405 Northbound Ramps at W. 182nd Street (Torrance/Caltrans)
3. Crenshaw Boulevard at I-405 Southbound Ramps (Torrance/Caltrans)
4. Western Avenue at I-405 Northbound Ramps (Torrance/Caltrans)
5. Crenshaw Boulevard at Crenshaw Place (Torrance)
6. Crenshaw Boulevard at W. 190th Street (Torrance)
7. Crenshaw Place at W. 190th Street (Torrance)
8. Project Driveway 1 at W. 190th Street (Torrance)
9. Project Driveway 2 at W. 190th Street (Torrance)
10. Van Ness Avenue at W. 190th Street (Torrance)
11. I-405 Southbound Ramps at W. 190th Street (Torrance/Caltrans)
12. Western Avenue at W. 190th Street (Torrance)

Cumulative Projects Description

- The seven (7) cumulative projects are expected to generate a combined total of 5,021 weekday daily trips (one half arriving, one half departing), with 735 trips (576 inbound and 159 outbound) forecast during the AM peak hour and 628 trips (138 inbound and 490 outbound) forecast during the PM peak hour.

Traffic Impact Analysis

Existing Traffic Conditions

- For Existing traffic conditions, six (6) of the twelve (12) signalized study intersections currently operate at unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining signalized study intersections operate at acceptable level of service during the AM and PM peak hours. The intersections operating adversely are as follows:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU	LOS	ICU	LOS
1. Crenshaw Boulevard at W. 182nd Street	--	--	1.049	F
2. I-405 NB ramps at W. 182nd Street	--	--	0.937	E
3. Crenshaw Boulevard at I-405 SB Ramps	1.028	F	1.000	E
5. Crenshaw Boulevard at Crenshaw Place	90.1 s/v	F	--	--
6. Crenshaw Boulevard at W. 190th Street	1.027	F	0.943	E
7. Crenshaw Place at W. 190th Street	64.4 s/v	F	--	--

Existing With Ambient Growth With Project Traffic Conditions

- For Existing with Ambient Growth with Project traffic conditions, the proposed Project will significantly impact five (5) study intersections are significantly impacted by the Project under the Existing with Ambient Growth with Project traffic conditions, which include

Crenshaw Boulevard/W. 182nd Street, I-405 Northbound Ramps/W. 182nd Street, Crenshaw Boulevard/I-405 Southbound Ramps, Van Ness Avenue at W. 190th Street and I-405 Southbound Ramps/W. 190th Street. Review of column (5) indicates that the implementation of planned and/or recommended improvements at the intersections will help offset the Project's impact.

Existing With Ambient Growth With Project With Cumulative Traffic Conditions

- For Existing with Ambient Growth with Project with Cumulative traffic conditions, the proposed Project, in combination with cumulative projects traffic, is forecast to cumulatively impact eight (8) study intersections during the AM and/or PM peak hour under the Existing with Ambient Growth with Project with Cumulative traffic conditions when compared to the LOS criteria defined in this report. The impacted intersections include Crenshaw Boulevard/W. 182nd Street, I-405 NB ramps at W. 182nd Street, Crenshaw Boulevard at I-405 SB Ramps, Western Avenue at I-405 NB Ramps, Crenshaw Boulevard at W. 190th Street, Crenshaw Place at W. 190th Street, Van Ness Avenue at W. 190th Street, and I-405 SB Ramps at W. 190th St.

  Review of column (8) indicates that the implementation of planned and/or recommended improvements at the intersections will help offset the Project's impact. Please note that the recommended improvements for the intersection of Western Avenue at 190th Street would require widening and additional right-of-way due to existing surrounding utilities. For the intersection of Crenshaw Boulevard/W. 190th Street, additional capacity-enhancing improvements at this key study intersection do not appear feasible due to physical and right-of-way restrictions that prohibit any additional widening and/or restriping. Therefore, the impact at this location will remain significant and unavoidable.

Traffic Impact Analysis – Caltrans Requirements (HCM Methodology)

Existing Traffic Conditions (HCM Methodology)

- For Existing traffic conditions, all four (4) state-controlled study intersections currently operate at acceptable level of service D or better during the AM and PM peak hours.

Existing With Ambient Growth With Project Traffic Conditions (HCM Methodology)

- For Existing with Ambient Growth With Project traffic conditions, all four (4) state-controlled study intersections are forecast to operate at acceptable level of service D or better during the AM and PM peak hours.

Existing with Ambient Growth With Cumulative With Project Traffic Conditions (HCM Methodology)

- For Existing with Ambient Growth with Project with Cumulative traffic conditions, all four (4) state-controlled study intersections are forecast to operate at acceptable level of service D or better during the AM and PM peak hours.

Caltrans Off-Ramp Queueing Analysis

Existing Traffic Conditions

- For Existing traffic conditions, the queues are adequate under Existing traffic conditions during both the AM and PM peak hours.

Existing With Ambient Growth With Project Traffic Conditions

- For Existing with Ambient Growth With Project traffic conditions, the queues are adequate under Existing traffic conditions during both the AM and PM peak hours.

Existing with Ambient Growth With Cumulative With Project Traffic Conditions

- For Existing with Ambient Growth with Project with Cumulative traffic conditions, the queues are adequate under Existing traffic conditions during both the AM and PM peak hours.

Site Access

- The driveways are forecast to operate at acceptable levels of service in the AM and PM peak hours. In addition, inbound queues into the project site are projected to be minimal and therefore it is noted that dedicated right-turn pockets at the project driveways are not required. However, modifications to the curb radii at Driveway 2 are recommended to help with ingress and egress to the site.

Project-Specific Improvements

The following improvements are being implemented as part of the proposed Project, which the Project is expected to pay the full construction costs:

- **Intersection 7 – Crenshaw Place at W. 190th Street:** Widen to provide additional right-of-way to construct an exclusive westbound right-turn lane. This improvement, which has been incorporated into the Project site plan as a Project "design feature" is subject to the review and approval of the City of Torrance.

Planned and Recommended Improvements

Existing With Ambient Growth (Year 2020) With Project Traffic Conditions

The proposed Project significantly impacts five (5) study intersections under Existing with Ambient Growth with Project traffic conditions. The planned and/or recommended improvements are as follows:

- **Intersection 1 – Crenshaw Boulevard at W. 182nd Street:** Planned improvements at the intersection include restriping the existing northbound right-turn lane into a shared through/right-turn lane, constructing an exclusive eastbound right-turn lane and westbound right-turn lane. Additional right-of-way will be required to construct these

improvements. Modify the existing traffic signal as necessary and remove the existing northbound right-turn overlap. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 2 – I-405 NB Ramps at W. 182nd Street:** Planned improvements at the intersection include restriping the existing northbound shared left/right-turn lane into an exclusive left-turn lane, constructing an exclusive northbound right-turn lane, and constructing an exclusive eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 3 – Crenshaw Boulevard at I-405 SB Ramps:** Planned improvements at the intersection include the construction of a new two-lane I-405 SB on-ramp from northbound Crenshaw Boulevard. As a result, additional improvements include the removal of the exclusive northbound left-turn lane, the construction of an exclusive northbound right-turn lane, the construction of an exclusive southbound right-turn lane, restriping the existing eastbound shared left/right-turn lane to an exclusive left-turn lane, and the construction of a second eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 10 – Van Ness Avenue at W. 190th Street:** Restripe the westbound approach to include an additional through lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance.

- **Intersection 11 – I-405 Southbound Ramps at W. 190th Street:** Construct an additional southbound left-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

Existing With Ambient Growth With Project With Cumulative Traffic Conditions

The proposed Project significantly impacts eight (8) study intersections under Existing with Ambient Growth with Project with Cumulative traffic conditions. The planned and/or recommended improvements are as follows:

- **Intersection 1 – Crenshaw Boulevard at W. 182nd Street:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include restriping the existing northbound right-turn lane into a shared through/right-turn lane, constructing an exclusive eastbound right-turn lane and westbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary and remove the existing northbound right-turn overlap. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 2 – I-405 NB Ramps at W. 182nd Street:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include restriping the existing northbound shared left/right-turn lane into an exclusive left-turn lane, constructing an exclusive northbound right-turn lane, and constructing an exclusive eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report.*

- **Intersection 3 – Crenshaw Boulevard at I-405 SB Ramps:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include the construction of a new two-lane I-405 SB on-ramp from northbound Crenshaw Boulevard. As a result, additional improvements include the removal of the exclusive northbound left-turn lane, the construction of an exclusive northbound right-turn lane, the construction of an exclusive southbound right-turn lane, restriping the existing eastbound shared left/right-turn lane to an exclusive left-turn lane, and the construction of a second eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 4 – Western Avenue at I-405 NB Ramps:** Restripe the existing westbound shared through/right-turn lane into an exclusive left-turn lane. Construct an exclusive westbound right-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

- **Intersection 6 – Crenshaw Boulevard at W. 190th Street:** No physical mitigation measures are feasible for the near term; any additional lanes will require widening and additional right-of-way. As such, the cumulative impact at this location is unavoidable and will remain unmitigated.

- **Intersection 10 – Van Ness Avenue at W. 190th Street:** *Same as those identified in Section 10.2.1.* Restripe the westbound approach to include an additional through lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance.

- **Intersection 11 – I-405 Southbound Ramps at W. 190th Street:** *Same as those identified in Section 10.2.1.* Construct an additional southbound left-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

- **Intersection 12 – Western Avenue at W. 190th Street:** No physical mitigation measures are feasible; any additional lanes will require widening, signal modification, utility relocation and/or additional right-of-way acquisition. As such, the cumulative impact at the intersection of Western Avenue at W. 190th Street is unavoidable and will remain unmitigated.

  Should additional right-of-way be obtained and existing surrounding utilities be relocated, construct a second southbound right-turn lane and an exclusive westbound right-turn lane. Additional right-of-way will be required to construct the additional turn lanes. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans. Although the proposed improvements are considered to be not feasible the City may still require fair share payment towards potential future improvements at this location.

Development Impact Fee

- On October 31, 2005, the Torrance City Council approved and adopted a Development Impact Fee (DIF) Program. Pursuant to the requirements of the City of Torrance, Development Impact Fees will be required of the Project. The DIF is applied to pay a portion of the costs identified for public facilities, including transportation-related improvements, as well as underground of utilities, sewer, and storm drain improvements, and Police and Fire facilities. The Development Impact Fee is based on the size of all new developments and is a one-time cost other than a tax or special assessment according information published by the City of Torrance Community Development Department. The precise fee required of the Project will be determined by the City of Torrance upon issuance of project building permits.
- Assuming the proposed Project falls under the "Industrial/Light" category, the Project can be expected to pay a total of $411,829.00 (305.550 KSF x $1,347.83) in Development Impact Fees. Although the existing office building is currently vacant, it is presumed that the prior development has paid it's appropriates fees when it was initially constructed, inclusive of participating in the City's DIF program (to be confirmed by the Project Applicant and City staff). Therefore, a potential credit of up to $927,894.40 (160.000 KSF x $5,799.34) could be applied assuming general office falls under the Commercial / General category. Pending review and confirmation by City staff, the Project shouldn't be required to pay into the DIF program since the DIF related to the existing office building exceeds the DIF of the current

Project. The category and precise fee will be determined upon issuance of project building permits by the City of Torrance.

REVISED TRAFFIC IMPACT ANALYSIS REPORT

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT

Torrance, California

August 6, 2020 (Original Date July 29, 2019)

1.0 INTRODUCTION

This traffic impact analysis evaluates the potential traffic impacts and circulation needs associated with the proposed 2555 W. 190th Street Warehouse/Manufacturing Project (hereinafter referred to as Project) in the City of Torrance, California. The subject property is currently developed with an existing vacant 160,000 square-foot (SF) office building which has not been actively marketed pending the redevelopment of the subject property as proposed by the Project, in addition to excess surface parking areas. The proposed Project includes the development of a state-of-the-art warehouse/cross dock industrial warehouse with 305,550 SF of floor area consisting of 86,780 SF of warehouse, 198,400 SF of manufacturing, and 20,370 SF of office, inclusive of 14,550 SF of mezzanine space.

1.1 Scope of Work

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan Engineers (LLG) to determine the potential impacts the Project may have on the local street system in the immediate vicinity of the Project site. The traffic impact analysis evaluates the operating conditions at twelve (12) key study intersections and Project site driveways, estimates the trip generation potential of the Project, estimates the trip generation potential of the cumulative projects, and forecasts future (existing and near-term) operating conditions without and with the Project.

Information concerning cumulative projects (planned and/or approved) in the vicinity of the Project has been researched in the City of Torrance. Based on our research, there are seven (7) planned and/or approved projects within the study area. These seven (7) related projects were considered in the cumulative traffic analysis for this Project.

This traffic impact analysis has been prepared according to the traffic impact requirements of the City of Torrance and is consistent with the most current *Congestion Management Program (CMP) for Los Angeles County*. The approved Scope of Work for this traffic study, which was developed in collaboration with City staff, is included in ***Appendix A***. The City of Torrance Traffic Impact Analysis Guidelines https://www.torranceca.gov/our-city/public-works/civil-and-traffic-engineering/traffic-engineering/traffic-impact-analysis-guidelines was used to assess the potential traffic impacts of development projects within the City jurisdiction, inclusive of the significant impact thresholds.

The Project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic count information has been compiled and is utilized in this report in support of a detailed intersection capacity analysis.

1.2 Study Area

The twelve (12) key study intersections selected for evaluation in this report provide local and regional access to the study area. They consist of the following:

1. Crenshaw Boulevard at W. 182nd Street (Torrance)
2. I-405 Northbound Ramps at W. 182nd Street (Torrance/Caltrans)
3. Crenshaw Boulevard at I-405 Southbound Ramps (Torrance/Caltrans)
4. Western Avenue at I-405 Northbound Ramps (Torrance/Caltrans)
5. Crenshaw Boulevard at Crenshaw Place (Torrance)
6. Crenshaw Boulevard at W. 190th Street (Torrance)
7. Crenshaw Place at W. 190th Street (Torrance)
8. Project Driveway 1 at W. 190th Street (Torrance)
9. Project Driveway 2 at W. 190th Street (Torrance)
10. Van Ness Avenue at W. 190th Street (Torrance)
11. I-405 Southbound Ramps at W. 190th Street (Torrance/Caltrans)
12. Western Avenue at W. 190th Street (Torrance)

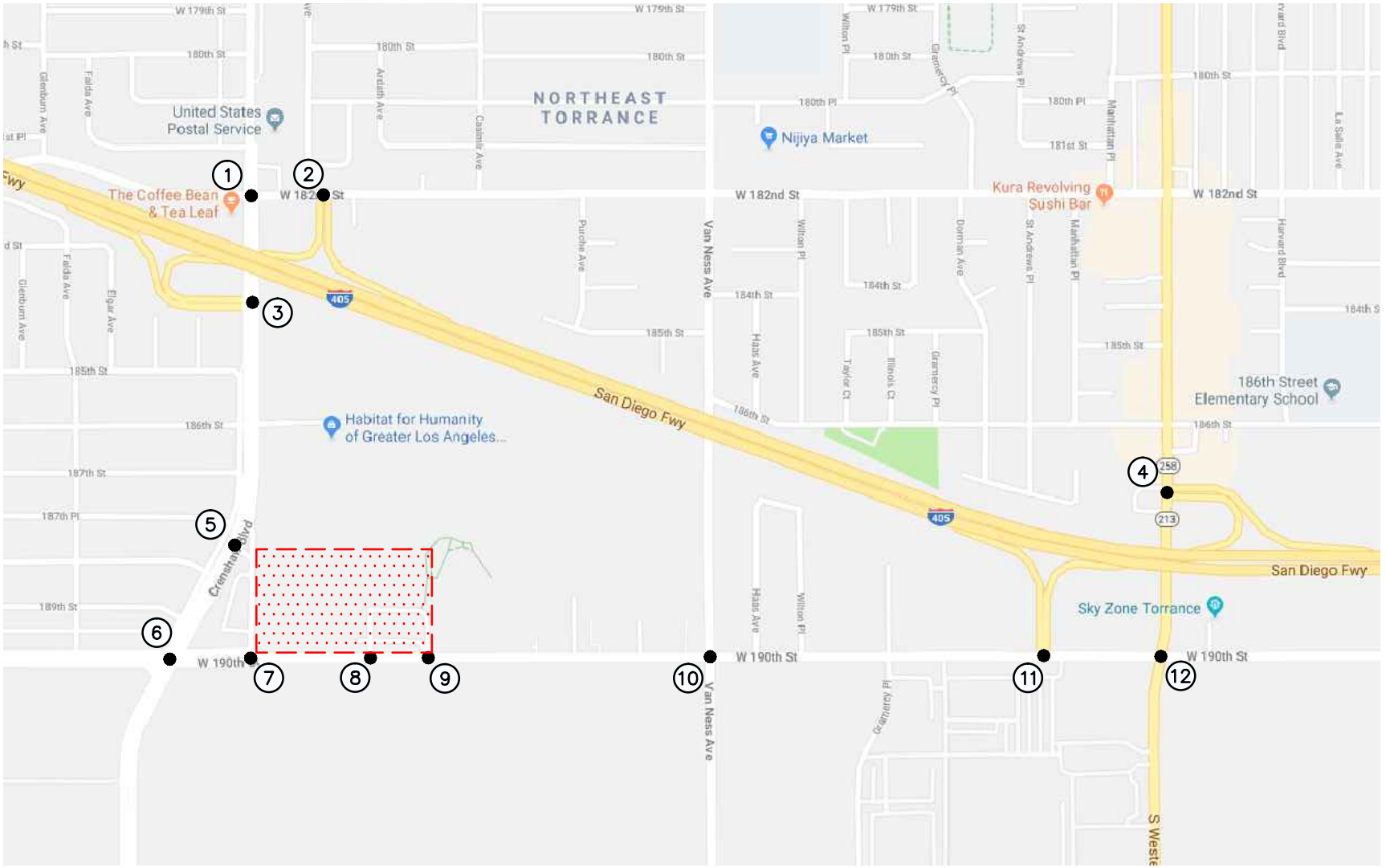
Figure 1-1 presents a Vicinity Map, which illustrates the general location of the Project and depicts the study intersections and surrounding street system.

1.3 Traffic Impact Analysis Components

The Volume-Capacity (V/C) and corresponding Level of Service (LOS) calculations at the key study intersections were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or addresses the impact of the Project.

Included in this Traffic Impact Analysis are:

- Existing Traffic Counts,
- Estimated Project traffic generation/distribution/assignment,
- Estimated Cumulative Projects traffic generation/distribution/assignment,
- AM and PM peak hour LOS analyses for Existing Conditions,
- AM and PM peak hour LOS analyses for Existing with Ambient Growth to the Year 2022 (Near-term) conditions without and with Project traffic,
- AM and PM peak hour LOS analyses for Existing with Ambient Growth to the Year 2022 (near-term) Conditions with Project and with cumulative projects traffic (i.e. cumulative traffic conditions),
- State of California (Caltrans) LOS and off-ramp queueing analysis,
- Recommended Improvements to off-set Project-Related impacts and/or Cumulative Project impacts,
- Site Access and Internal Circulation Evaluation, and
- Congestion Management Program (CMP) assessment.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 1-1

VICINITY MAP

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

1.4 Traffic Impact Analysis Scenarios

The following scenarios, per the approved scope of work, are those for which volume-capacity (V/C) and corresponding LOS calculations have been performed at the key intersections for Existing and Year 2022 traffic conditions:

A. Existing Traffic Conditions,
B. Existing With Ambient Growth (Year 2022) Traffic Conditions,
C. Existing With Ambient Growth (Year 2022) With Project Traffic Conditions,
D. Scenario (C) With Recommended Improvements, if any, to off-set Project impacts
E. Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions,
F. Scenario (E) With Recommended Improvements, if any, to off-set cumulative traffic impacts.

2.0 PROJECT DESCRIPTION AND LOCATION

The Project site is located at 2555 W. 190th Street in the City of Torrance, California. It is bounded by Crenshaw Boulevard/Crenshaw Place to the west and by W. 190th Street to the south. The Project site currently developed with an existing 160,000 SF office building that is currently vacant and has not been actively marketed pending the redevelopment of the subject property as proposed by the Project, in addition to excess surface parking areas. ***Figure 2-1*** displays the existing site aerial of current site layout and access locations.

Table 2-1 presents the development summary for the existing and proposed uses of the Project. Review of *Table 2-1* indicates that the proposed Project includes development of a state-of-the-art warehouse/cross dock industrial warehouse with 305,550 square-feet (SF) of floor area consisting of 86,780 SF of warehouse, 198,400 SF of manufacturing, and 20,370 SF of office, inclusive of 14,550 SF of mezzanine space. The Project would require demolition of the existing 160,000 SF office building. Parking for the Project, calculated at 1 space per 1500 SF for warehouse/storage space, 1 space per 400 SF of manufacturing, and 1 space per 250 SF of office space per Section 93.2.33 of the City's Municipal Code, will be provided via surface parking. ***Figure 2-2*** illustrates the conceptual site plan for the Project prepared by Ware Malcomb.

The Project is expected to be constructed by Year 2022 which has been utilized to assess the Project's potential opening year (full buildout/occupancy) traffic impacts within a near-term cumulative traffic setting.

2.1 Site Access

Vehicular access to the Project site will be provided via the existing unsignalized full access driveway (Project Driveway 1) and signalized full access driveway (Project Driveway 2) located along W. 190th Street, a third unsignalized full access "gated access" driveway on Crenshaw Place (Project Driveway 3), and a fourth unsignalized driveway located on Crenshaw Place (Project Driveway 4) in close proximity to Crenshaw Boulevard. As part of the proposed Project's design features, an exclusive westbound right-turn lane will be constructed at the intersection of Crenshaw Place at 190th Street in order to help facilitate truck access to/from the site.

2.2 Pedestrian Circulation

Pedestrian circulation will be provided via existing public sidewalks along W. 190th Street and Crenshaw Place within the vicinity of the project frontage. The proposed Project will protect the existing sidewalk along project frontage and if necessary, repair or reconstruct sidewalks along the project frontage per the City's request. The existing sidewalk system within the project vicinity provides direct connectivity to the surrounding commercial properties and major thoroughfares.

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N NO SCALE

SOURCE: GOOGLE

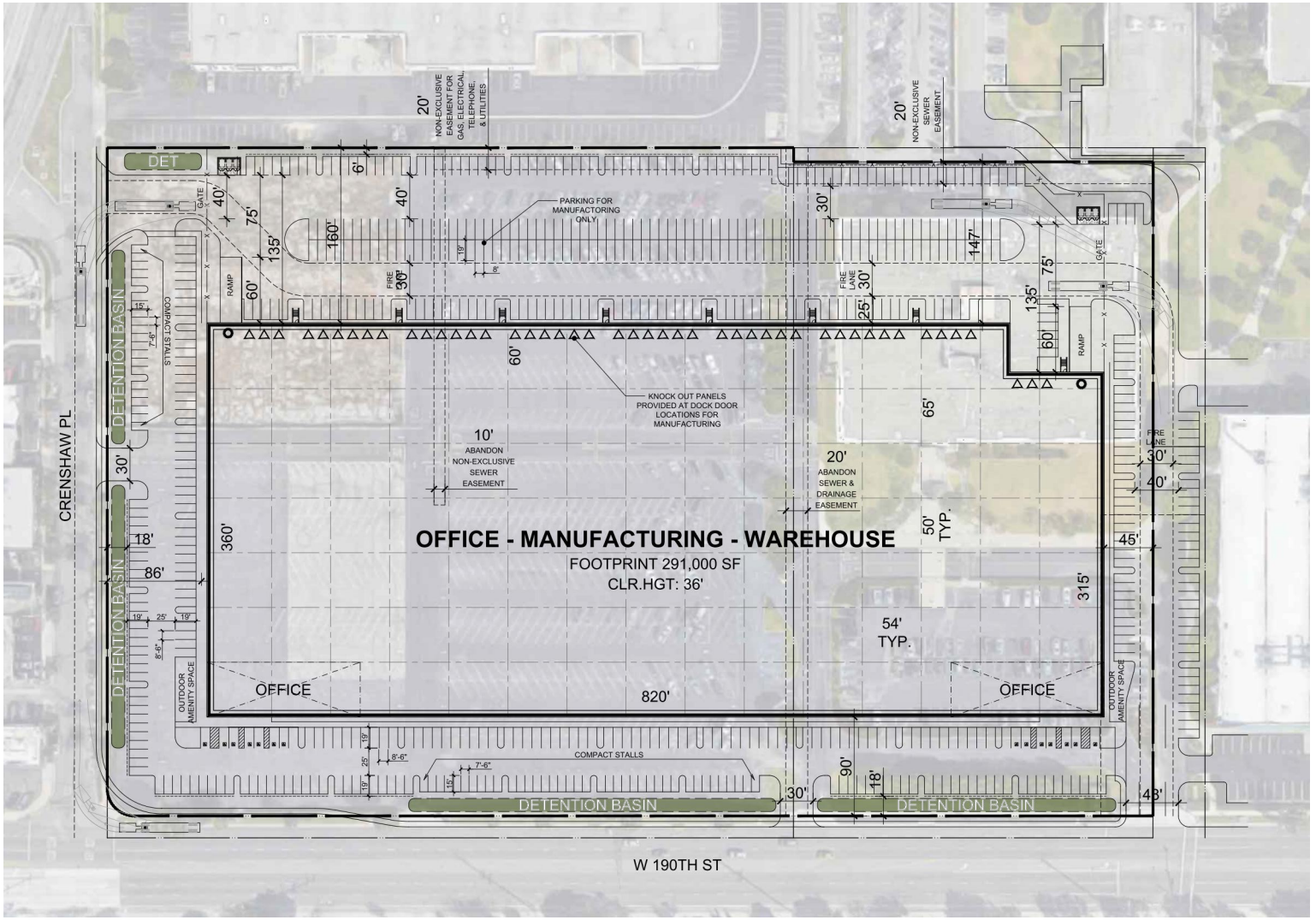
KEY

= PROJECT SITE

FIGURE 2-1

EXISTING SITE PLAN

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING, TORRANCE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: WARE MALCOMB

FIGURE 2-2

PROPOSED SITE PLAN

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

TABLE 2-1

PROJECT DEVELOPMENT SUMMARY[1]

Land Use / Project Description	Existing Development – Square-Footage (SF)	Proposed Project Development – Square-Footage (SF)
Office / Warehouse / Manufacturing Floor Area Allocation		
❑ Office	160,000 SF	20,370 SF
❑ Warehouse	--	86,780 SF
❑ Manufacturing	---	198,400 SF
Total Building Floor Area	**160,000 SF**	**305,550 SF**

Notes:
- SF = square foot of development

[1] Source: Comstock Crosser & Associates/ware Malcomb, *Conceptual Site Plan – Scheme 12b.*

3.0 ANALYSIS CONDITIONS AND METHODOLOGY

3.1 Existing Street System

The principal local network of streets serving the proposed Project is Crenshaw Boulevard, Crenshaw Place, Van Ness Avenue, Western Avenue, W. 182nd Street and W. 190th Street. The following discussion provides a brief synopsis of these key area roadways. The descriptions are based on an inventory of existing roadway conditions.

Crenshaw Boulevard is a north-south, six-lane, divided roadway that borders the Project site. The posted speed limit on Crenshaw Boulevard is 40 mph north of W. 190th street and 45 mph south of W. 190th street. On-street parking is generally not permitted along either side of the roadway within the vicinity of the Project. The City of Torrance Circulation Element designates Crenshaw Boulevard as a Major Arterial. The study intersections of Crenshaw Boulevard at W. 182nd Street, I-405 Southbound Ramps, and W. 190th Street are controlled by a traffic signal. The study intersection of Crenshaw Boulevard at Crenshaw Place is controlled by a one-way stop sign.

Crenshaw Place is a north-south, two-lane, undivided roadway that borders the Project site. The posted speed limit on Crenshaw Place is 25 mph. On-street parking is generally permitted along both sides of the roadway within the vicinity of the Project. The City of Torrance Circulation Element designates Crenshaw Place as a Local Street. The study intersection of Crenshaw Place at W. 190th Street is controlled by a one-way stop sign.

Van Ness Avenue is a north-south, four-lane, divided roadway located east of the Project site. The posted speed limit on Van Ness Avenue is 35 mph. On street parking is permitted along the northbound side north of W. 190th street. The city of Torrance Circulation Element designates Van Ness Avenue as a Minor Arterial. The study intersection of Van Ness Avenue at W. 190th Street is controlled by a traffic signal.

Western Avenue is a north-south, four-lane, divided roadway located east of the Project site. The posted speed limit on Western Avenue is 45 mph. On-street parking is permitted along the northbound side north of W. 190th street. The City of Torrance Circulation Element designates Western Avenue as a Major Arterial. The study intersections of Western Avenue at I-405 Northbound Ramps and W. 190th street are controlled by a traffic signal.

W. 182nd Street is an east-west, four lane, divided roadway located to the north of the Project site. The posted speed limit on W. 182nd Street is 35 mph. On street parking is permitted along the westbound side. The City of Torrance Circulation Element designates W. 182nd Street as a Minor Arterial. The study intersection of I-405 Northbound Ramps at W. 182nd Street is controlled by a traffic signal.

W. 190th Street is an east-west, six-lane, divided roadway located south of the Project site. The posted speed limit of W. 190th Street is 45 mph. On street parking is generally not permitted along both sides of the roadway within the vicinity of the Project. The City of Torrance Circulation Element designates W. 190th Street as a Major Arterial. The study intersections of Project Driveway

2 and I-405 Southbound Ramps at W. 190th Street are controlled by a traffic signal. The study intersection of Project Driveway 1 at W. 190th Street is controlled by a one-way stop sign.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area intersections neighboring the Project site.

3.2 Existing Traffic Volumes

Manual vehicular turning movement counts were conducted at the twelve (12) key study locations during the weekday morning and evening peak commuter periods to determine the existing AM and PM peak hour traffic volumes. AM and PM peak hour traffic counts at the key study intersections were collected by National Data and Surveying Services in May 2019.

Figures 3-2 and ***3-3*** depict the existing AM and PM peak hour traffic volumes at the twelve (12) key study intersections, respectively. The existing AM and PM peak hour traffic volumes illustrated in *Figures 3-2* and *3-3* are comprised of passenger vehicles, large 2-axle trucks, 3-axle trucks, 4+ axle trucks, recreational vehicles and buses. The large trucks, recreational vehicles and buses turning movements were converted to passenger car equivalents (P.C.E.'s) factors of 1.5, 2.0 and 3.0 were utilized for large 2-axle trucks, 3-axle trucks and 4+-axle trucks, respectively. ***Appendix B*** contains the detailed manual turning movement count sheets for the twelve (12) key study intersections evaluated in this report.

3.3 Existing Public Transit

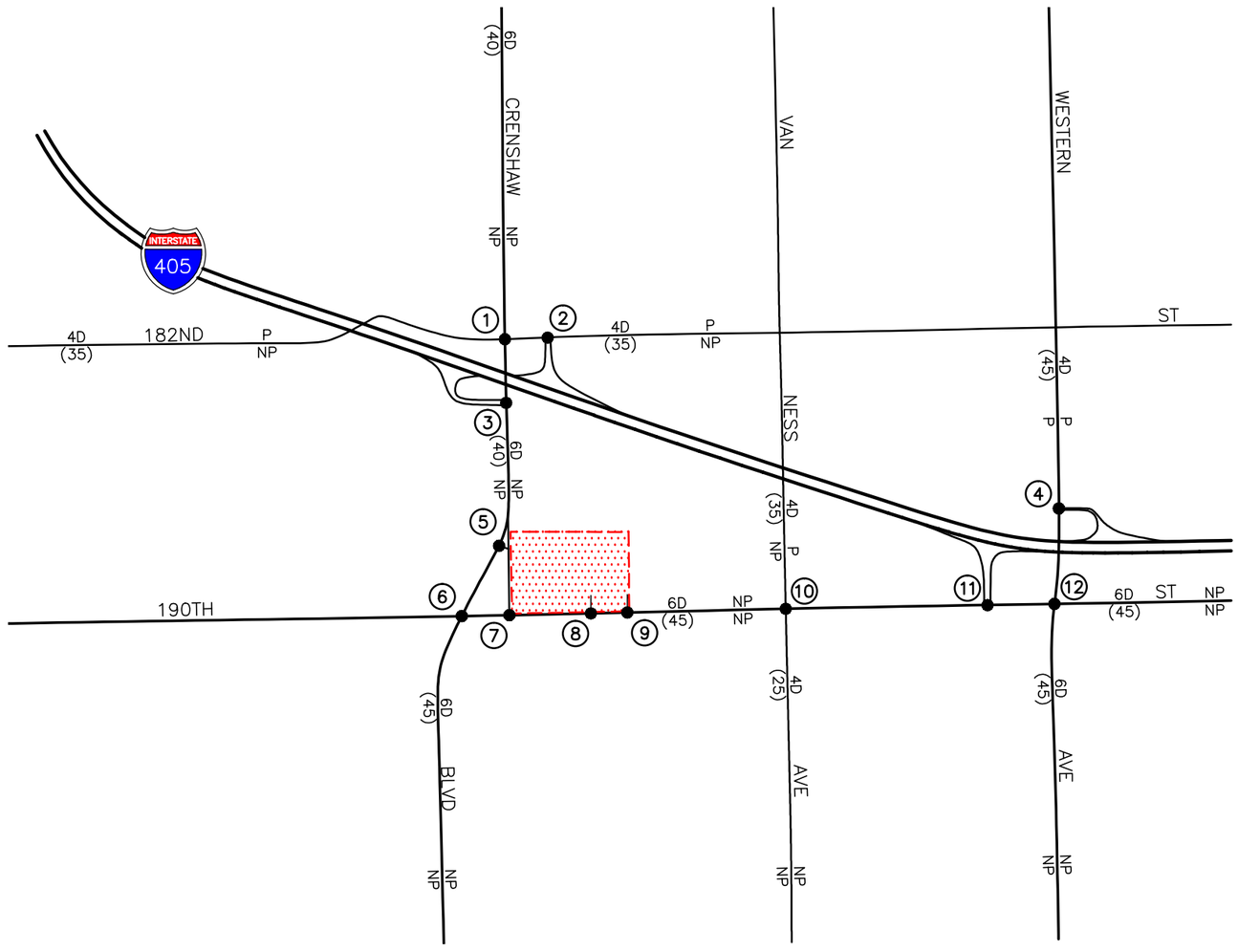
Torrance Transit operates Lines 5, 6, and 10 within the study area. Gardena Transit operates Line 2 within the study area Bus stops are generally provided along Crenshaw Boulevard, Van Ness Avenue, Western Avenue, and W. 190th Street.

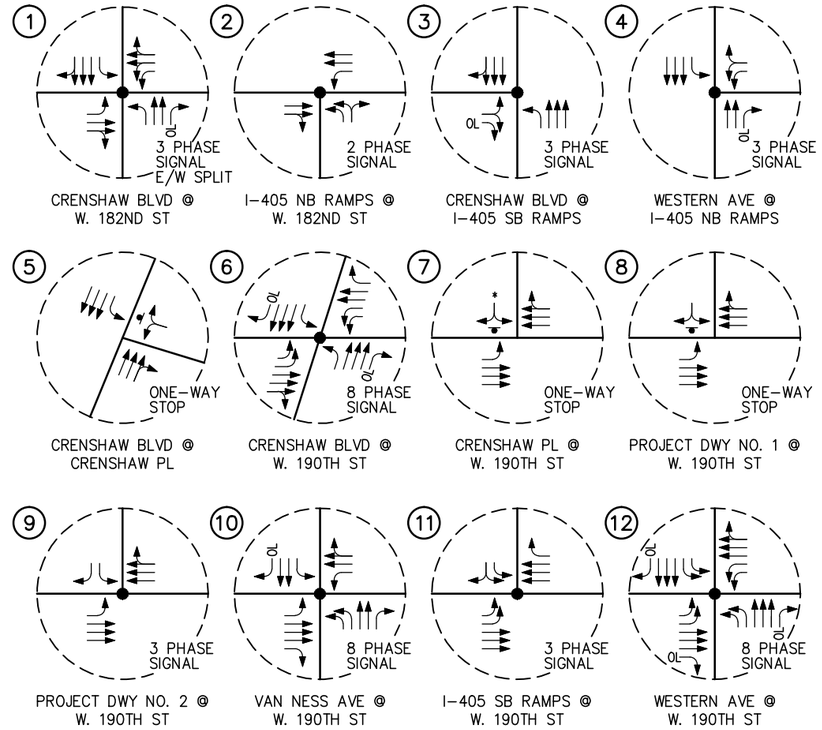
Torrance Transit Line 5:

- The route extends from Pacific Coast Highway/Crenshaw Boulevard to Crenshaw Station.
- The route traverses the study area on Van Ness Avenue, with the closest bus stop located in the northwest corner of Van Ness Avenue/W. 190th Street.
- During the AM and PM peak hours, headways are approximately one bus in each direction every hour.

Torrance Transit Line 6:

- The route extends from Carson Street/Hawthorne Boulevard to Artesia Station
- The route traverses the study area on W. 190th Street, with the closest bus stop located in the northeast corner of Honeywell/W. 190th Street.
- During the AM and PM peak hours, headways are approximately one bus in each direction every 45 minutes.





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N NO SCALE

KEY

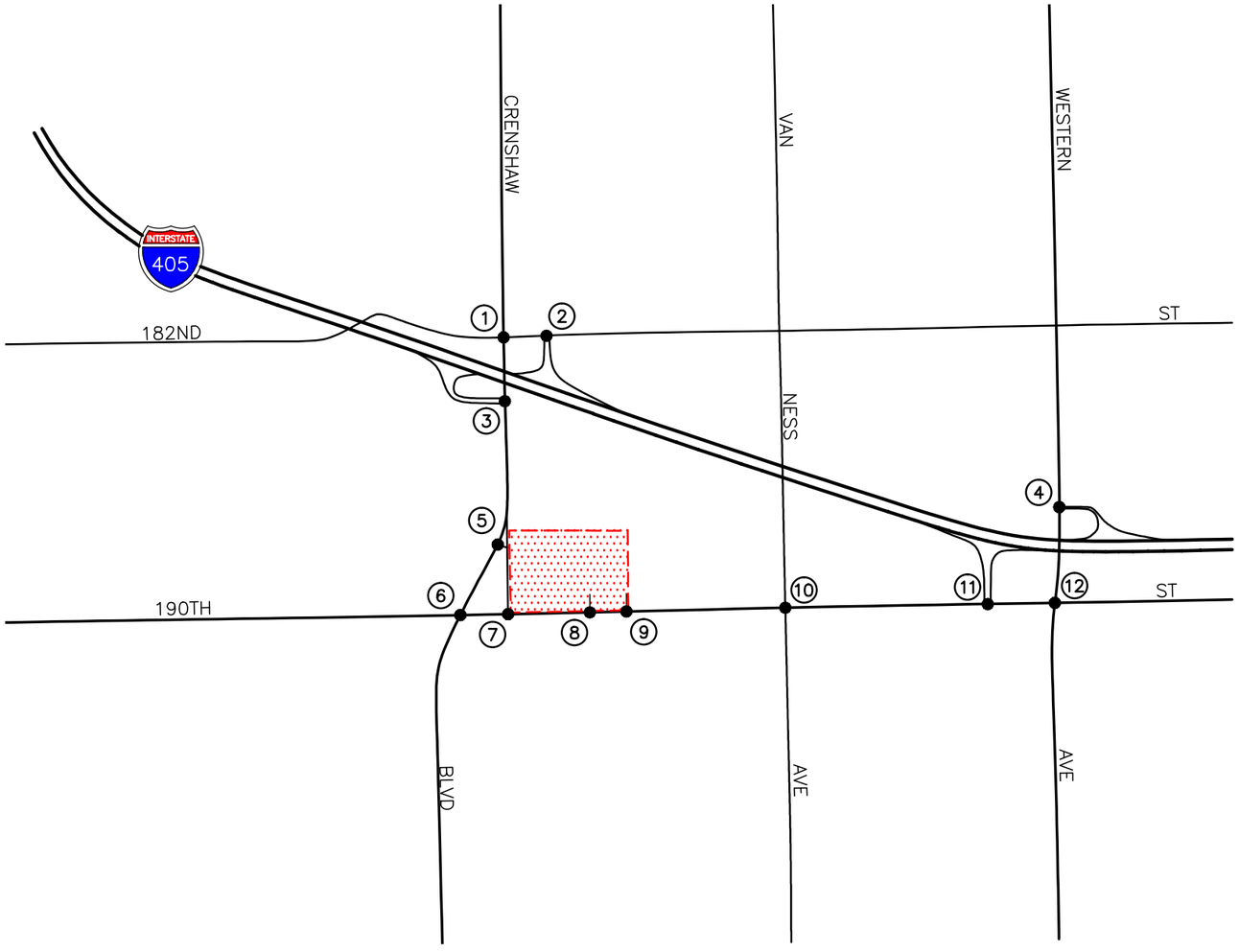
(#) = STUDY INTERSECTION
= APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ▾ = STOP SIGN
P = PARKING, NP = NO PARKING
* = NO LEFT-TURN BETWEEN 4:00PM TO 6:00PM

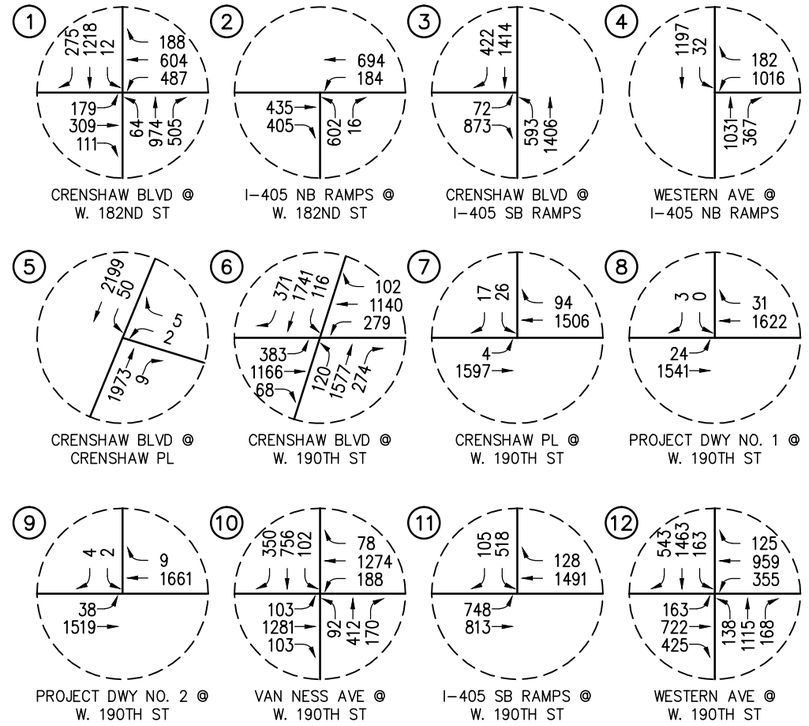
U = UNDIVIDED, D = DIVIDED
2 = NUMBER OF TRAVEL LANES
(XX) = POSTED SPEED LIMIT (MPH)
OL = OVERLAP
= PROJECT SITE

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





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N NO SCALE

KEY

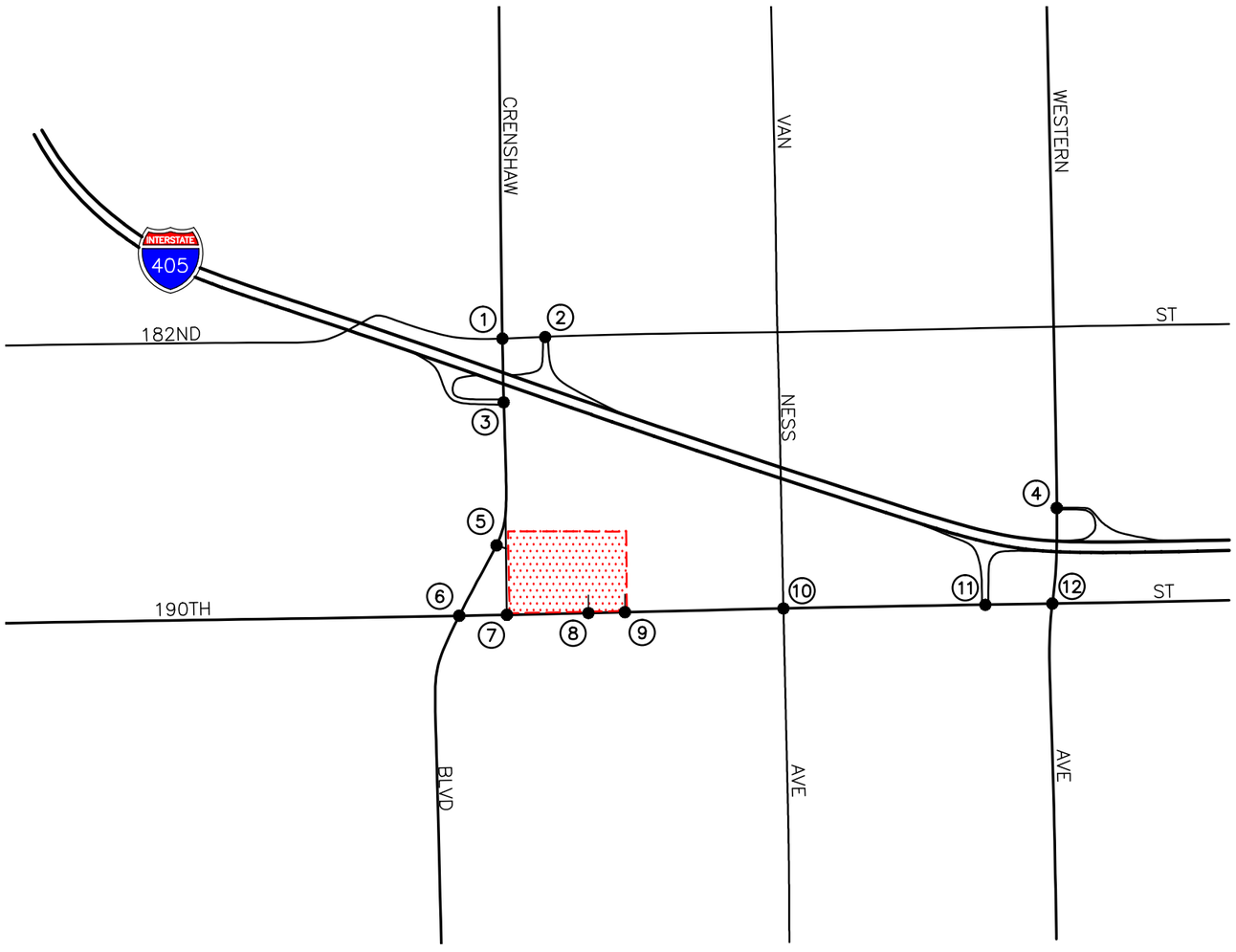
(#) = STUDY INTERSECTION

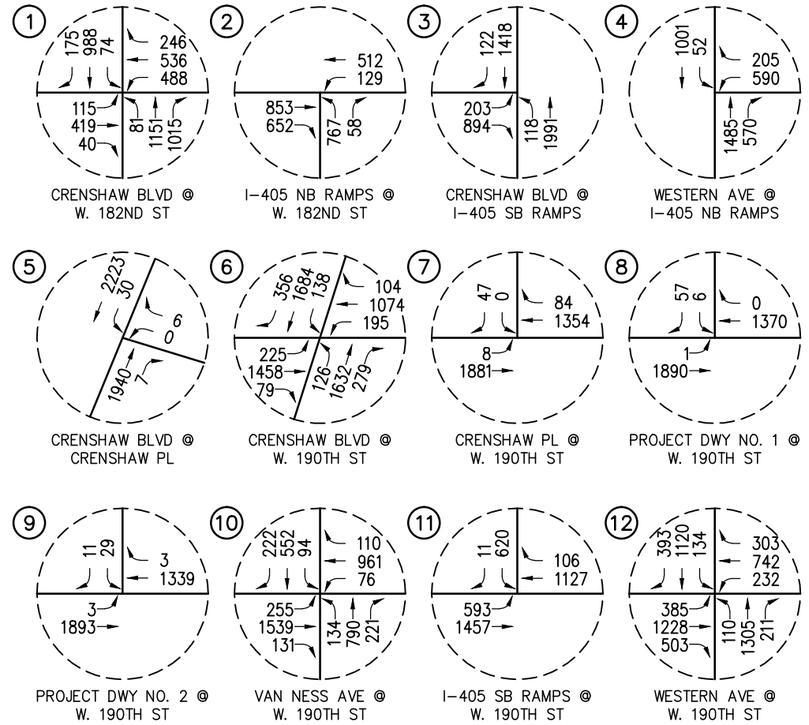
= PROJECT SITE

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 3-3

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

Torrance Transit Line 10:

- The route extends Pacific Coast Highway/Crenshaw Boulevard to Crenshaw Station.
- The route traverses the study area on Crenshaw Boulevard with the closest bus stops located on the northeast corner of Crenshaw Boulevard/W. 190th Street.
- During the AM and PM peak hours, headways are approximately one bus in each direction every 30 minutes.

Gardena Transit Line 2:

- The route circles Western Avenue, Imperial Highway, Vermont Avenue, Normandie Avenue, and Pacific Coast Highway.
- The route traverses the study area on Western Avenue with the closest bus stops located on the southwest corner of Western Avenue/W. 190th Street.
- During the AM and PM peak hours, headways are approximately one bus in each direction every 15 minutes.

3.4 Level of Service (LOS) Analysis Methodologies

AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Intersection Capacity Utilization (ICU) Methodology* for signalized intersections. Any unsignalized key study intersections were evaluated using the methodology outlined in the *Highway Capacity Manual (HCM)*.

3.4.1 *Intersection Capacity Utilization (ICU) Method of Analysis (Signalized Intersections)*

In conformance with City of Torrance requirements, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Intersection Capacity Utilization (ICU)* method of analysis. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

The ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through and right-turn lanes and dual left-turn capacity of 2,880 vph. A clearance adjustment factor of 0.10 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***. The ICU value is the sum of the critical volume-to-capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements.

3.4.2 *Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)*

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. For all-way stop controlled intersections, the overall average control delay measured in seconds per vehicle, and level of service is then calculated for the entire intersection. For one-way and two-way stop-controlled (minor street stop-controlled) intersections, this methodology estimates the worst side street delay, measured in seconds per vehicle and determines the level of service for that approach. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in ***Table 3-2.***

3.5 Impact Criteria and Thresholds

The relative impact of the added Project traffic volumes generated by the proposed Project during the AM and PM peak hours was evaluated based on analysis of future operating conditions at the key study intersections, without, then with, the proposed Project using the *Intersection Capacity Utilization (ICU) Methodology* and the *Highway Capacity Manual (HCM) Methodology*. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships, delay and service level characteristics at each key study intersection. The significance of the potential impacts of the Project at each key study intersection was then evaluated using the following LOS standards and traffic impact criteria. It is noted that according to the City of Torrance, LOS D or better is the City's target for intersection operation. The LOS D objective for the roadway network reflects the City's desire to maintain a minimum acceptable condition during the morning and evening peak commute hours on all intersections within the City.

3.5.1 *Signalized Intersections Criteria*

- For signalized intersections an impact is considered significant if the project related increase in the volume to capacity (V/C) ratio equals or exceeds the threshold shown below:

Level of Service (LOS)	Project-Related V/C Increase
C	0.04 or more
D	0.02 or more
E/F	0.01 or more

Source: *Los Angeles County Department of Public Works (LACDPW) Los Angeles County Traffic Impact Analysis Report Guidelines (January 1, 1997).*

As indicated above, the Project-related increase in ICU value that defines a significant impact varies with LOS. At LOS C or LOS D, the threshold of significance is an increase of 0.04 or greater or 0.02 or greater, respectively, in the ICU value. This is reduced to 0.01 or greater under LOS E and F.

3.5.2 *Unsignalized Intersections Criteria*

- For unsignalized intersections an impact is considered significant if the project causes an intersection at LOS D or better to degrade to LOS E or F.

However, unsignalized intersection LOS is based on the control delay, but delay is only assessed for those traffic movements that are stopped or must yield to through traffic. Some movements, including cross traffic on the minor street or left turns onto the major street are acceptable with long delays, provided through traffic and right turns from a major street do not experience any delays at stopped intersections. When delay for cross traffic is severe (LOS F), the intersection should be further evaluated for possible improvement with traffic signals. In some cases, this analysis determines that the delay is being experienced by a very low number of vehicles and traffic signals are not warranted. For this condition, the intersection does not need to be considered impacted, but measures to reduce delay may be considered, if appropriate. In other cases, the number of stopped vehicles is substantial and traffic signals may be justified as a mitigation measure. Therefore, the following significance criteria for unsignalized intersections are used:

An unsignalized intersection impact is considered to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a signal is justified.

TABLE 3-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU METHODOLOGY)[2]

Level of Service (LOS)	Intersection Capacity Utilization Value (ICU)	Level of Service Description
A	≤ 0.600	**EXCELLENT**. No vehicle waits longer than one red light and no approach phase is fully used.
B	0.601 – 0.700	**VERY GOOD**. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	**GOOD**. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	**FAIR**. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	**POOR**. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	**FAILURE**. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

[2] Source: *Transportation Research Board Circular 212 - Interim Materials on Highway Capacity.*

TABLE 3-2

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[3]

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

[3] Source: *Highway Capacity Manual*, (Unsignalized Intersections).

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations and/or rates to the Project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound Project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway segments and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the impact of the Project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast Project traffic. If necessary, the need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Trip Generation Forecast

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project. As shown, ITE Land Use 140: Manufacturing, ITE Land Use 150: Warehousing, and ITE Land Use 710: General Office Building average trip rates were used.

Table 5-2 presents the trip generation forecast for the Existing Land Use and the proposed Project. A review of the upper portion of *Table 5-2* indicates that the existing office building has a trip generating potential of 1,558 daily trips, with 186 trips (160 inbound, 26 outbound) produced in the AM peak hour and 184 trips (29 inbound, 155 outbound) produced in the PM peak hour on an average weekday.

A review of the middle portion of *Table 5-2* indicates that the proposed Project, after applying passenger car equivalent (PCE) factors to the warehousing/manufacturing components, is forecast to generate approximately 1,417 weekday daily PCE trips, with 222 PCE trips (176 inbound, 46 outbound) produced in the AM peak hour and 253 PCE trips (75 inbound, 178 outbound) produced in the PM peak hour. Of the total trips generated by Project, truck trips related to the warehousing/manufacturing components are forecast total 478 weekday daily PCE trips, with 101 PCE trips produced in the AM peak hour and 135 PCE trips produced in the PM peak hour.

A comparison of trips generated by the Project to the Existing Land Use indicates that the net trip generation for the proposed Project would result in 141 less daily trips, 36 more AM peak hour trips, and 69 more PM peak hour trips. However, since the existing office building is currently vacant, the existing trip credit will not be applied to the analysis to provide a conservative assessment.

5.2 Project Trip Distribution and Assignment

The directional traffic distribution pattern for passenger car traffic and truck traffic of the proposed Project is graphically presented in ***Figures 5-1*** and ***5-2***, respectively. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the Project site,
- Torrance Truck Route Map and
- input from City staff.

The anticipated AM and PM peak hour Project volumes associated with the proposed Project are presented in ***Figures 5-3*** and ***5-4,*** respectively. The traffic volume assignments presented in *Figures 5-3* and *5-4* reflect the traffic distribution characteristics shown in *Figures 5-1* and *5-2* and the traffic generation forecast presented in *Table 5-2.*

TABLE 5-1

PROJECT TRIP GENERATION RATES WITH PCE CONVERSION FACTORS[4]

ITE Land Use Code	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Rates:							
▪ ***140: Manufacturing – Total (TE/1000 SF)***	***3.93***	***0.48***	***0.14***	***0.62***	***0.21***	***0.46***	***0.67***
❑ Passenger Cars – 79.57% Daily (TE/1000 SF)	3.13	0.34	0.10	0.44	0.14	0.29	0.43
❑ 2 Axle Trucks – 3.46% Daily/16.95% Peak Hour (TE/1000 SF)	0.14	0.02	0.01	0.03	0.01	0.03	0.04
❑ 3 Axle Trucks – 4.64% Daily/22.71% Peak Hour (TE/1000 SF)	0.18	0.03	0.01	0.04	0.02	0.03	0.05
❑ 4+ Axle Trucks – 12.33% Daily/60.34% Peak Hour (TE/1000 SF)	0.48	0.09	0.02	0.11	0.04	0.11	0.15
▪ ***150: Warehousing – Total (TE/1000 SF)***	***1.74***	***0.13***	***0.04***	***0.17***	***0.05***	***0.14***	***0.19***
❑ Passenger Cars – 79.57% Daily (TE/1000 SF)	1.38	0.09	0.03	0.12	0.03	0.09	0.12
❑ 2 Axle Trucks – 3.46% Daily/16.95% Peak Hour (TE/1000 SF)	0.06	0.01	0.00	0.01	0.00	0.01	0.01
❑ 3 Axle Trucks – 4.64% Daily/22.71% Peak Hour (TE/1000 SF)	0.08	0.01	0.00	0.01	0.00	0.02	0.02
❑ 4+ Axle Trucks – 12.33% Daily/60.34% Peak Hour (TE/1000 SF)	0.22	0.02	0.01	0.03	0.02	0.02	0.04
▪ **710: General Office Building (TE/1000 SF)**	**9.74**	**86%**	**14%**	**1.16**	**16%**	**84%**	**1.15**

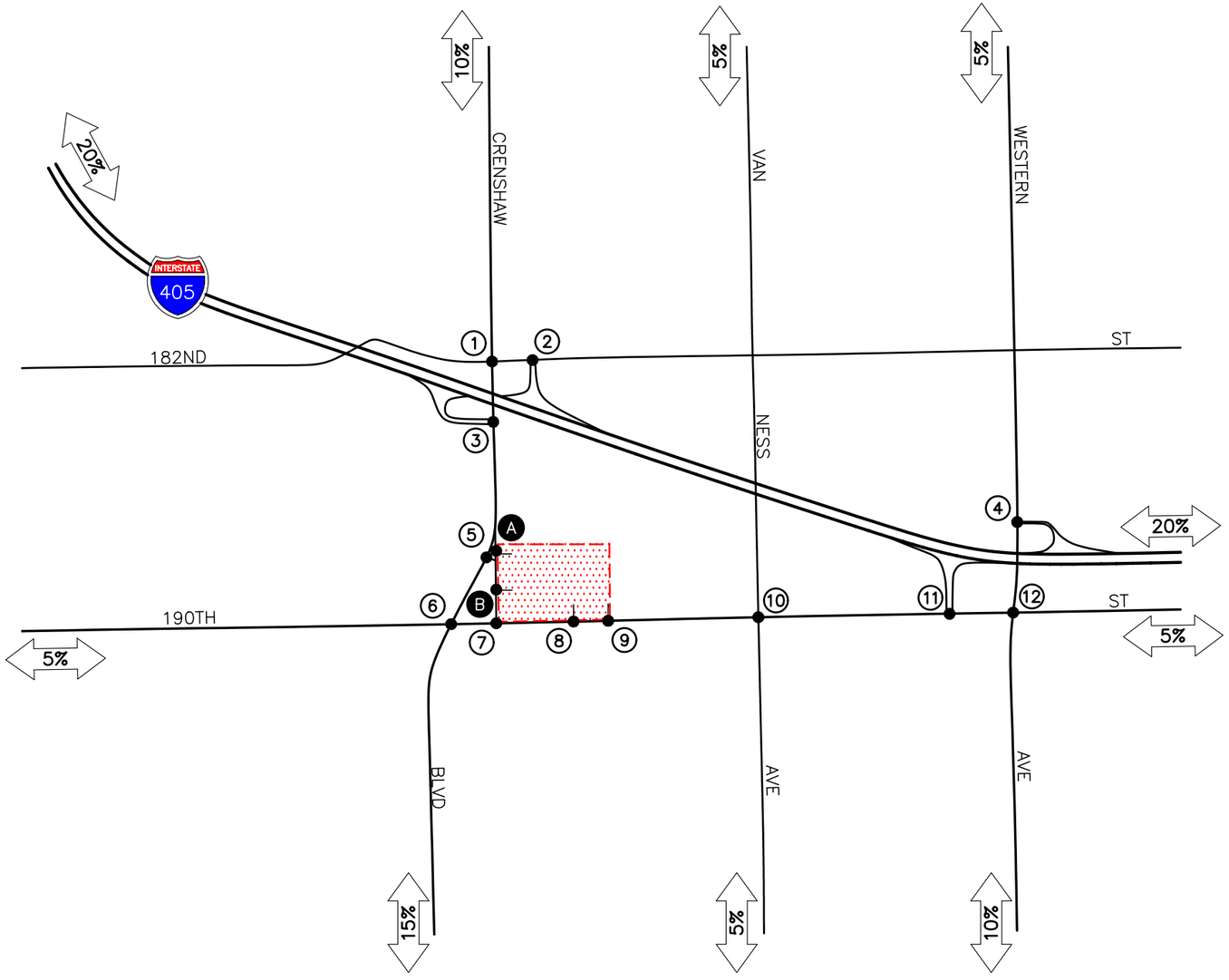
Notes:
- TE/1000 SF = Trip ends per 1,000 SF of development
- SF = Square-feet of gross floor area
- PCE = Passenger Car Equivalent

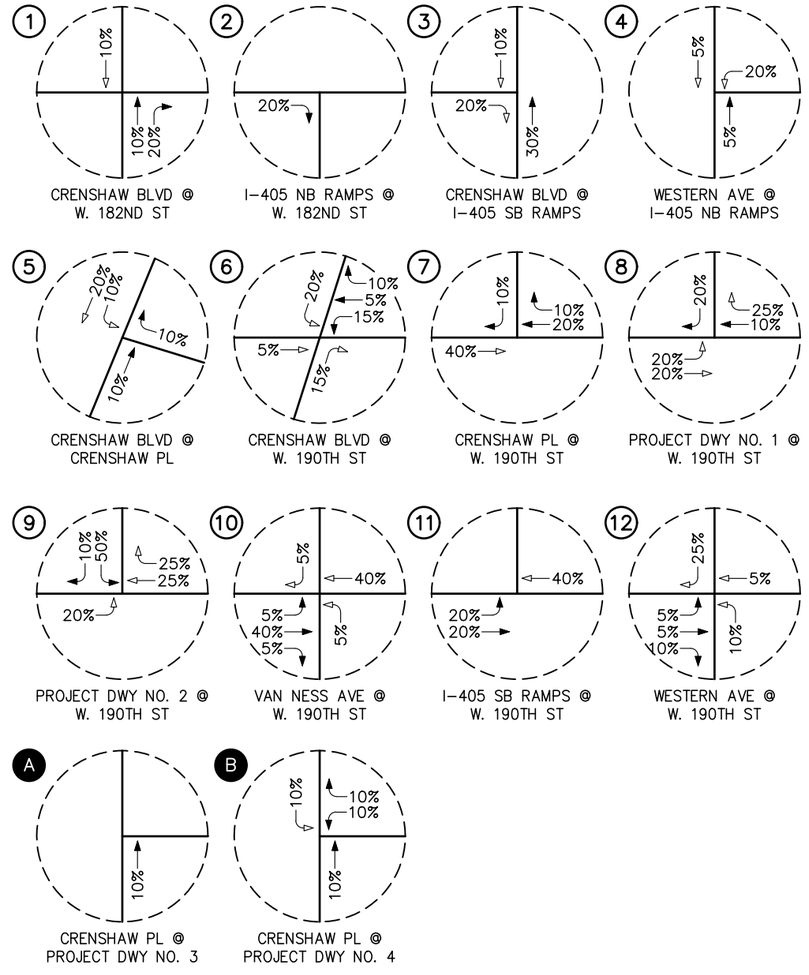
[4] Source: *Trip Generation, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017)*. Recommended mix of traffic, including mix of 2-axle, 3-axle, and 4+-axle trucks are based on the *Truck Trip Generation Study – City of Fontana, August 2003.* All 2-axle, 3-axle and 4+-axle trucks are converted to passenger car equivalents using a factor of 1.5 vehicles per truck, 2.0 vehicles per truck, and 3.0 vehicles per truck, respectively.

TABLE 5-2
PROJECT TRIP GENERATION FORECAST

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Existing Land Use Trip Generation Forecast [A]:							
▪ 710: Office Building (160,000 SF)	1,558	160	26	186	29	155	184
Project Trip Generation Forecast [B][5]:							
▪ 150: Warehousing (86,780 SF)							
❑ Passenger Cars	120	8	2	10	3	7	10
❑ 2 Axle Trucks	8	1	0	1	0	1	1
❑ 3 Axle Trucks	14	2	0	2	0	3	3
❑ 4+ Axle Trucks	57	5	3	8	5	5	10
Warehousing Total	199	16	5	21	8	16	24
▪ 140: Manufacturing (198,400 SF)							
❑ Passenger Cars	621	67	20	87	28	57	85
❑ 2 Axle Trucks	42	6	3	9	3	9	12
❑ 3 Axle Trucks	71	12	4	16	8	12	20
❑ 4+ Axle Trucks	286	54	11	65	24	65	89
Manufacturing Total	1,020	139	38	177	63	143	206
▪ 710: Office Space (20,370 SF)	198	21	3	24	4	19	23
Total Passenger Car Traffic	**939**	**96**	**25**	**121**	**35**	**83**	**118**
Total Truck PCE Traffic	**478**	**80**	**21**	**101**	**40**	**95**	**135**
Total Project Trip Generation	**1,417**	**176**	**46**	**222**	**75**	**178**	**253**
Total Net Project Trip Generation ([B] – [A])	**-141**	**16**	**20**	**36**	**46**	**23**	**69**

[5] Source: *Trip Generation, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017)*. Recommended mix of traffic, including mix of 2-axle, 3-axle, and 4+-axle trucks are based on the *Truck Trip Generation Study – City of Fontana, August 2003.* All 2-axle, 3-axle and 4+-axle trucks are converted to passenger car equivalents using a factor of 1.5 vehicles per truck, 2.0 vehicles per truck, and 3.0 vehicles per truck, respectively.





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N NO SCALE

KEY

= INBOUND PERCENTAGE

= OUTBOUND PERCENTAGE

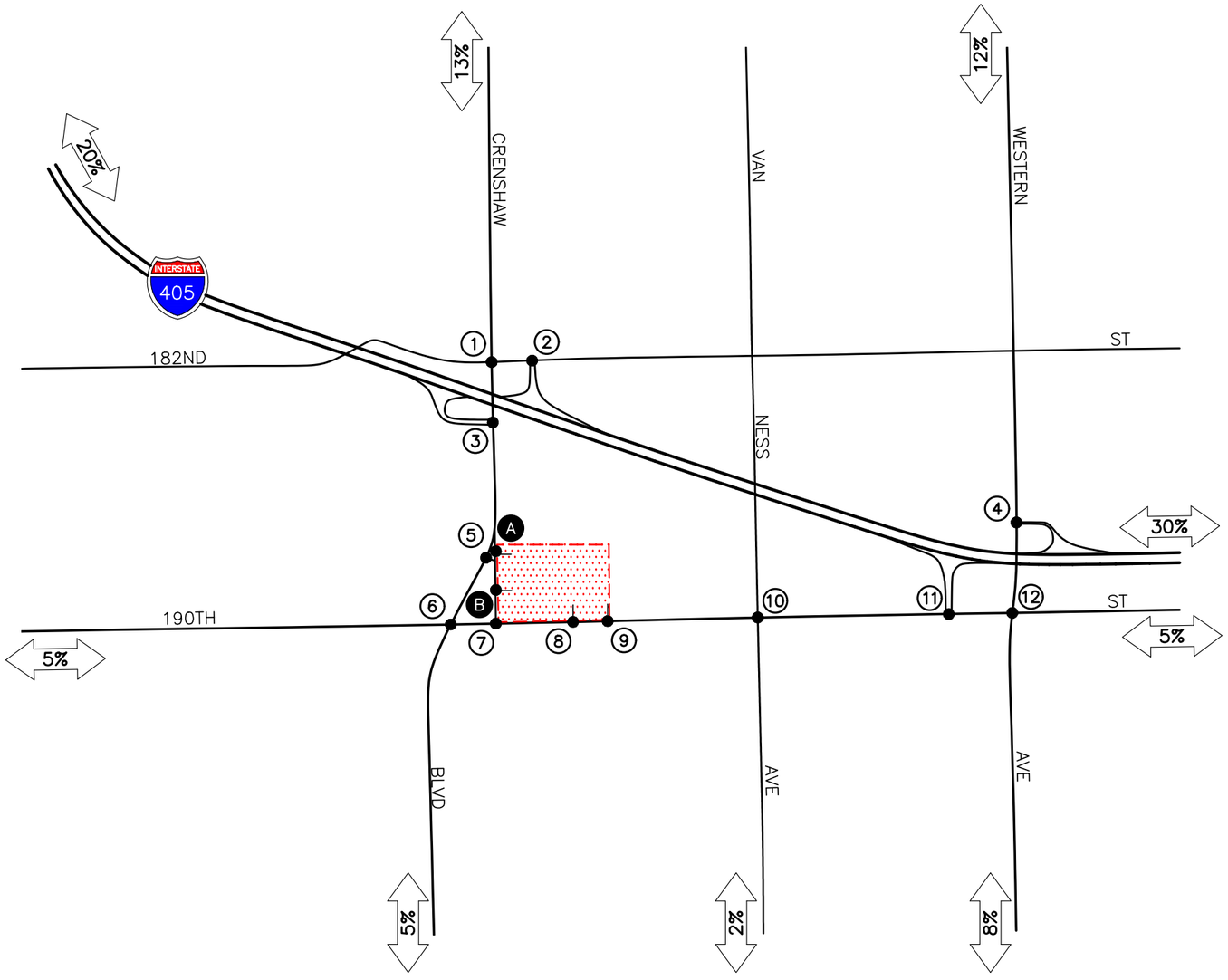
(#) = STUDY INTERSECTION

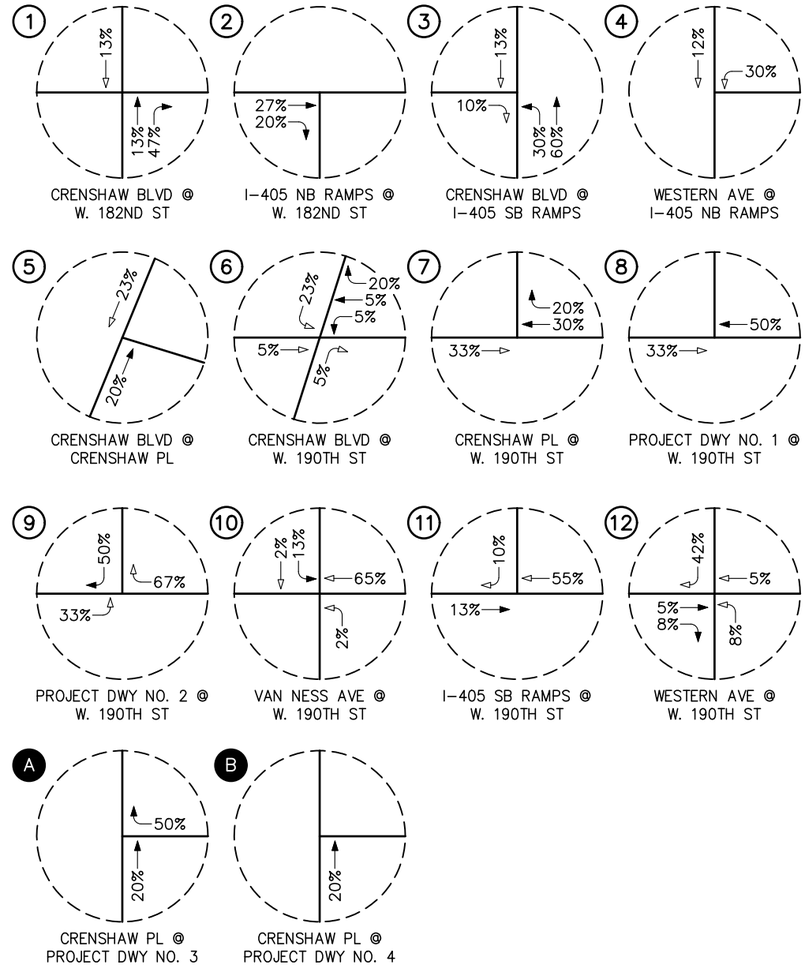
= PROJECT SITE

FIGURE 5-1

PROJECT TRAFFIC DISTRIBUTION PATTERN (PASSENGER CARS)

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





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N NO SCALE

KEY

= INBOUND PERCENTAGE

= OUTBOUND PERCENTAGE

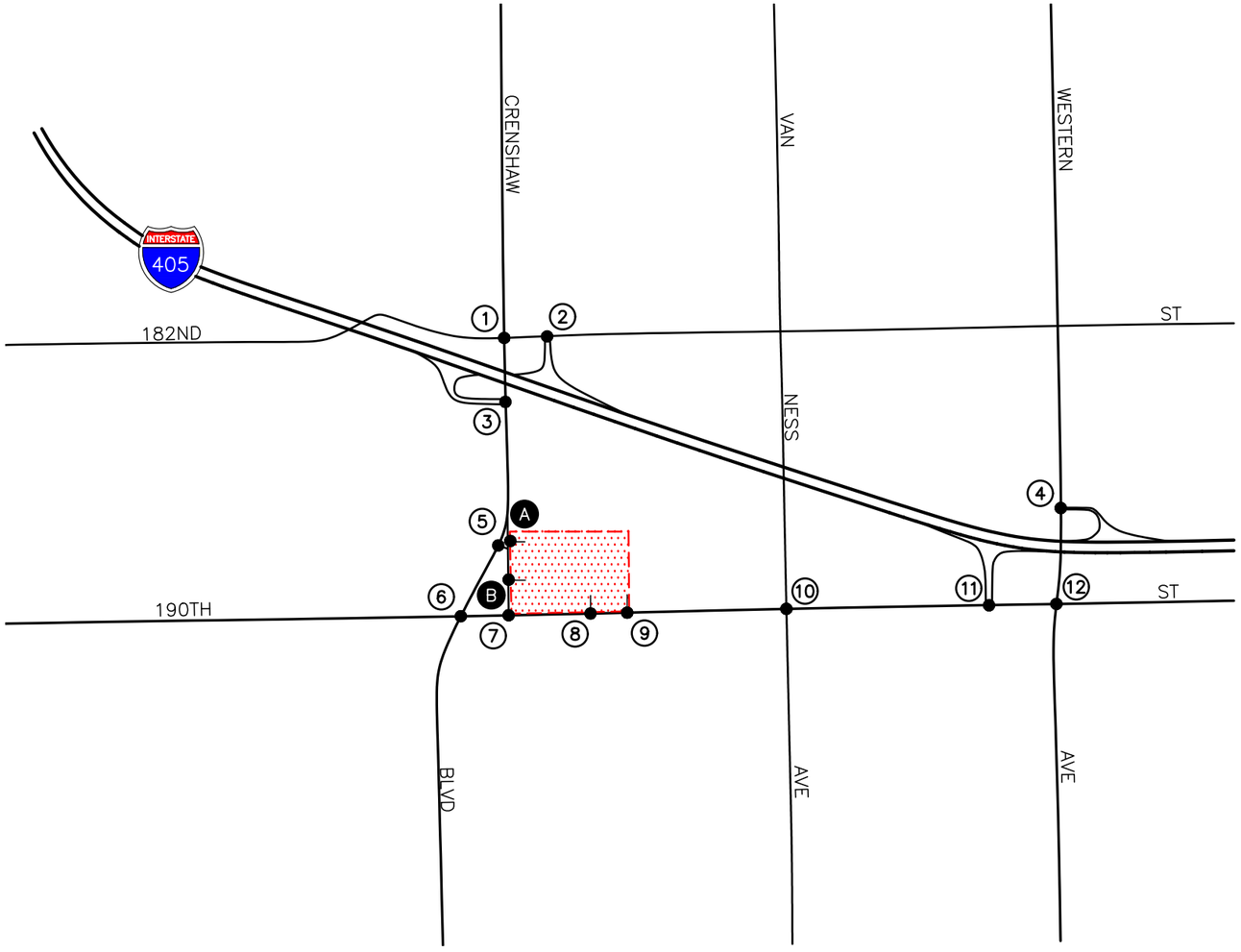
(#) = STUDY INTERSECTION

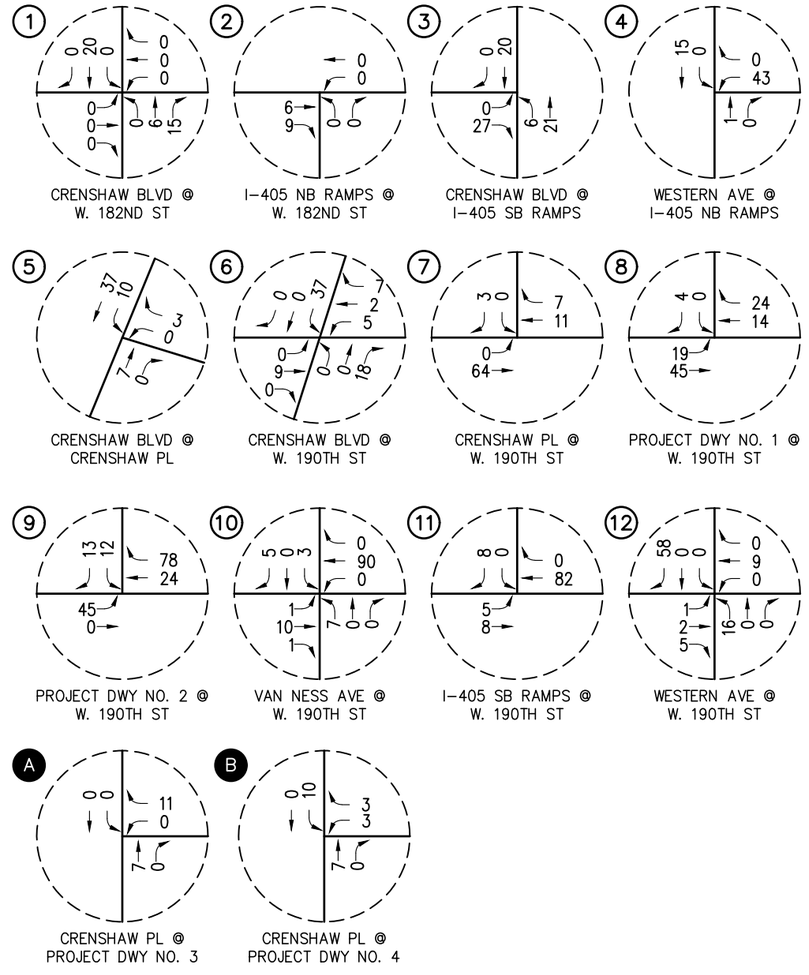
= PROJECT SITE

FIGURE 5-2

PROJECT TRAFFIC DISTRIBUTION PATTERN (TRUCKS)

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

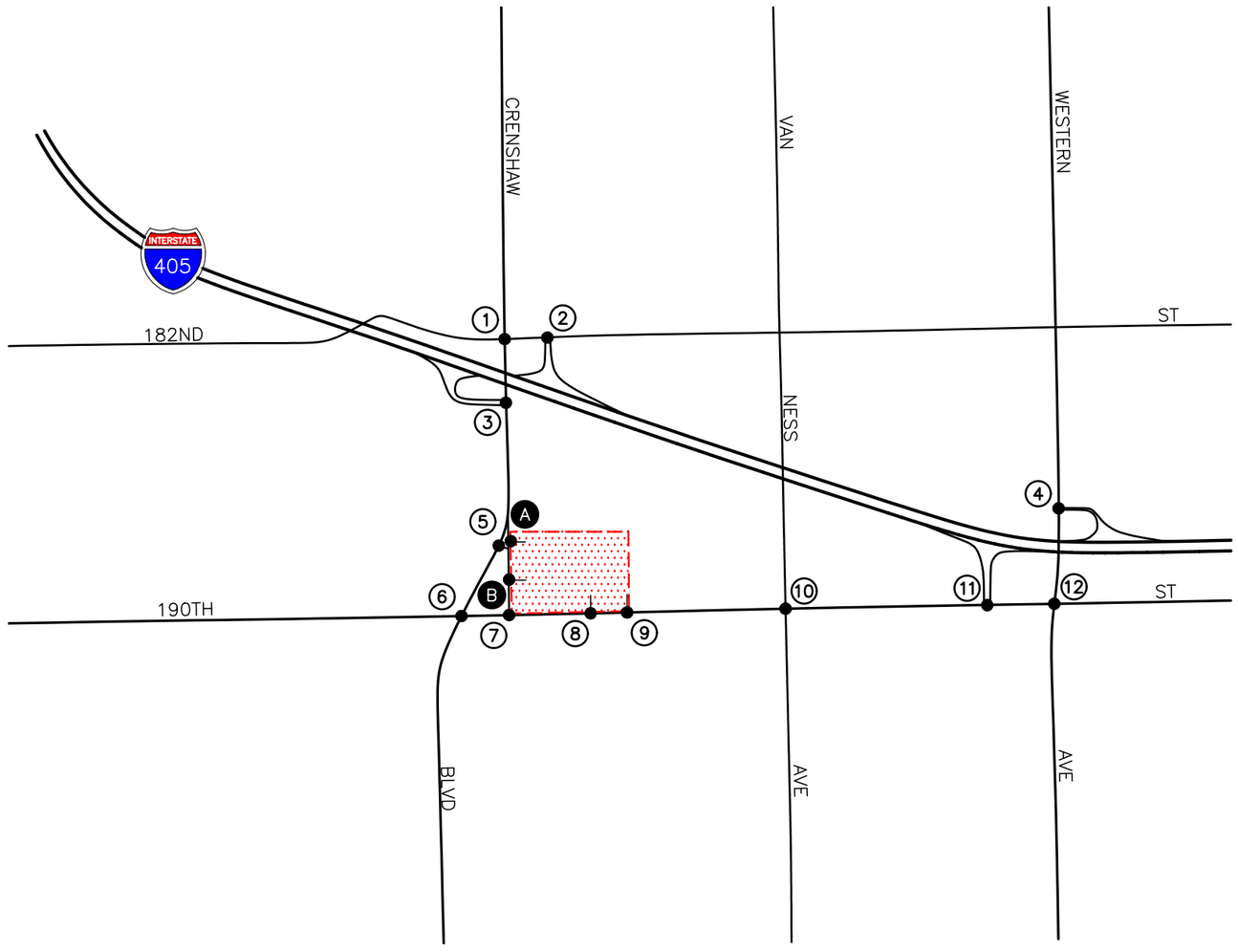
(#) = STUDY INTERSECTION

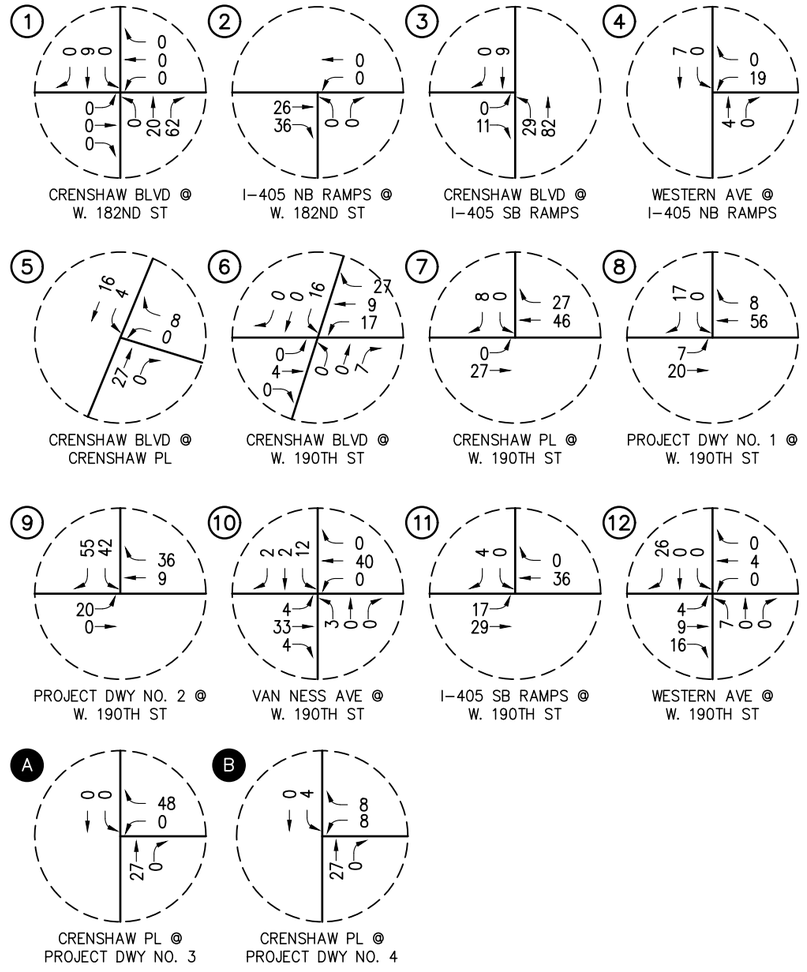
= PROJECT SITE

FIGURE 5-3

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 5-4

PM PEAK HOUR PROJECT TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

For future traffic conditions, background traffic growth estimates have been calculated using an ambient growth factor. The ambient growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The application of the one percent (1%) annual growth rate to baseline Year 2019 traffic volumes results in a two percent (3%) growth in existing baseline volumes at the twelve (12) key study intersections to horizon Year 2022.

6.2 Cumulative Projects Traffic

Cumulative project research was completed for the City of Torrance for a total of seven (7) cumulative projects within the Project study area. Cumulative projects, as defined by Section 15355 of the CEQA Guidelines, are "closely related past, present and reasonably foreseeable probable future projects". The Traffic Impact Analysis assumes that all of these cumulative projects will be developed and operational when the proposed Project is operational. This is the most conservative, worst-case approach, since the exact timing of each cumulative project is uncertain. In addition, impacts for these cumulative projects would likely be, or have been, subject to mitigation measures, which could reduce potential impacts. Under this analysis, however, those mitigation measures are not considered. The locations of the seven (7) cumulative projects are presented in ***Figure 6-1***.

Table 6-1 presents the address and description/size of the seven (7) cumulative projects. ***Table 6-2*** presents the resultant trip generation for the seven (7) cumulative projects. As shown in *Table 6-2*, the seven (7) cumulative projects are expected to generate a combined total of 5,021 weekday daily trips (one half arriving, one half departing), with 735 trips (576 inbound and 159 outbound) forecast during the AM peak hour and 628 trips (138 inbound and 490 outbound) forecast during the PM peak hour.

The anticipated AM and PM peak hour cumulative projects traffic volumes at the twelve (12) key study intersections are presented in ***Figures 6-2*** and ***6-3***, respectively.

6.3 Year 2022 Traffic Volumes

Figures 6-4 and ***6-5*** present the AM and PM peak hour Existing with Ambient Growth to the Year 2022 traffic volumes at the twelve (12) key study intersections, respectively. ***Figures 6-6*** and ***6-7*** present the AM and PM peak hour Existing with Ambient Growth to the Year 2022 with Project traffic volumes at the twelve (12) key study intersections, respectively.

Figures 6-8 and ***6-9*** present the AM and PM peak hour Existing with Ambient Growth to Year 2022 with Project with Cumulative Projects traffic volumes at the twelve (12) key study intersections, respectively.

TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[6]

No.	Location/Address	Location/Address	Description
City of Torrance			
1.	CUP04-00004	1918 Artesia Boulevard	55,000 SF religious facility expansion with a full day school of 150 students
2.	CUP13-00031	305 Crenshaw Boulevard	90,000 SF industrial building
3.	CUP13-00032	465 Crenshaw Boulevard	17,800 SF regional transit center with 3,100 SF restaurant
4.	CUP14-00032	570 Alaska Avenue	31,015 SF manufacturing/warehouse expansion
5.	CUP15-00014	17500 Block of Prairie	62 DU senior living and 3,000 SF commercial
6.	CUP18-00005	2200 195th Street	410,000 SF industrial buildings
7.	CUP18-00011	1991 Del Amo Boulevard	17,375 SF industrial buildings

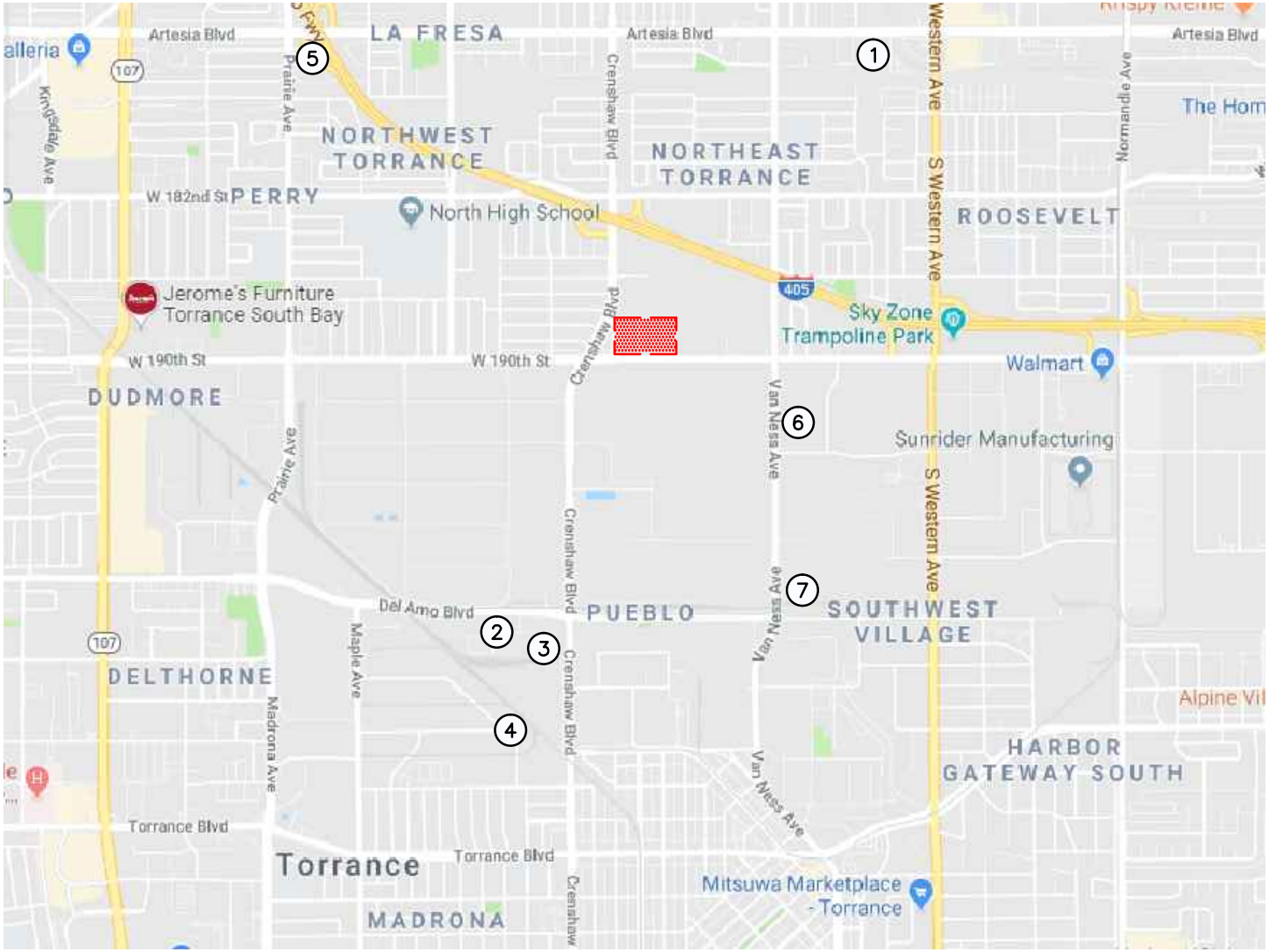
Notes:
- SF = Square-feet
- DU = Dwelling units

[6] Source: *Cities of Torrance and Lomita Planning Departments.*

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[7]

Cumulative Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1. CUP04-00004	284	55	46	101	12	14	26
2. CUP13-00031	446	55	8	63	7	50	57
3. CUP13-00032	1,718	181	57	238	65	167	232
4. CUP14-00032	122	15	4	19	7	14	21
5. CUP15-00014	331	6	9	15	12	11	23
6. CUP18-00005	2,034	253	34	287	34	224	258
7. CUP18-00011	86	11	1	12	1	10	11
Cumulative Projects Trip Generation Forecast	**5,021**	**576**	**159**	**735**	**138**	**490**	**628**

[7] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017). Average rates used.



KEY

1. CUP04–00004
2. CUP13–00031
3. CUP13–00032
4. CUP14–00032
5. CUP15–00014
6. CUP18–00005
7. CUP18–00011

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N NO SCALE

SOURCE: GOOGLE

KEY

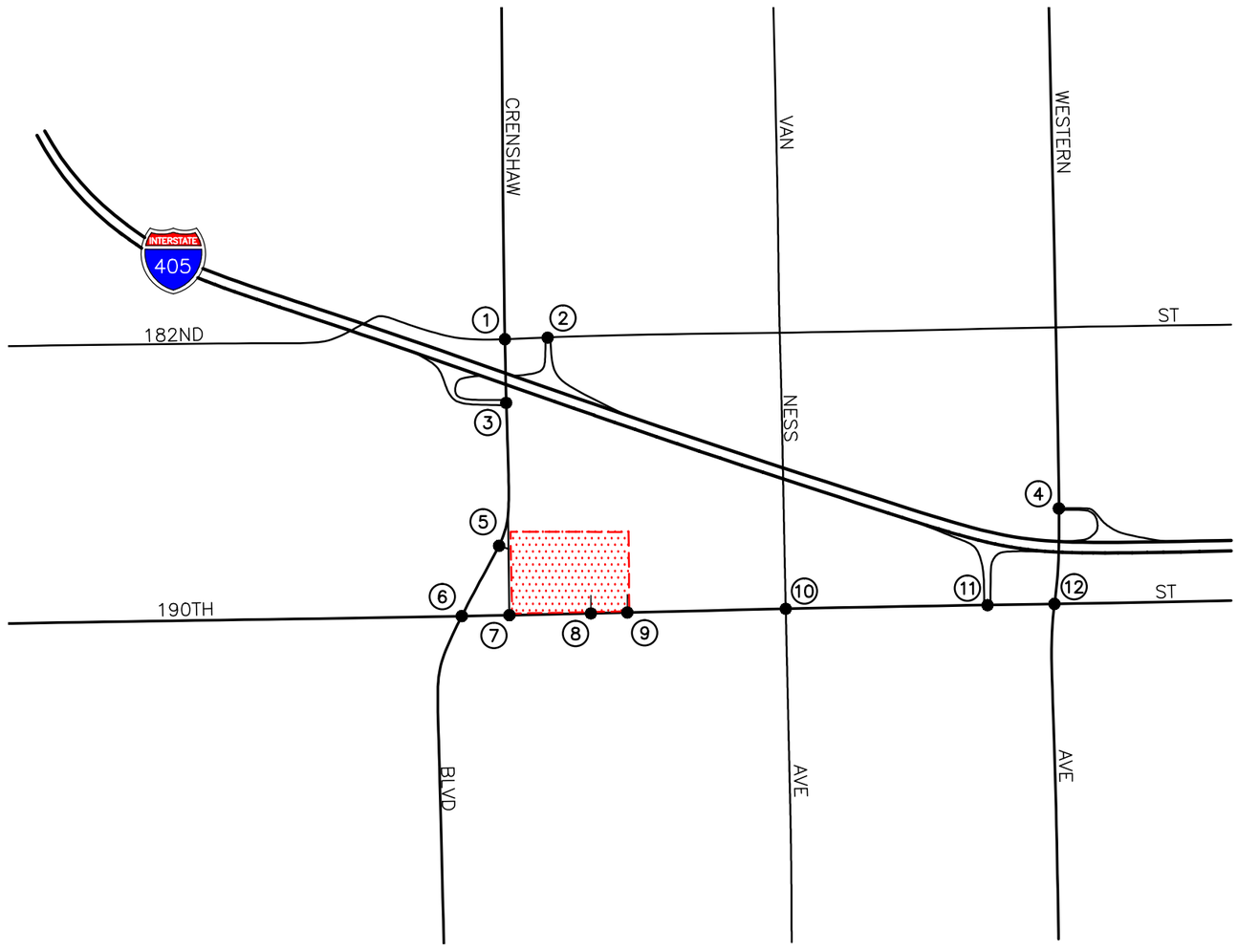
(#) = CUMULATIVE PROJECT LOCATIONS

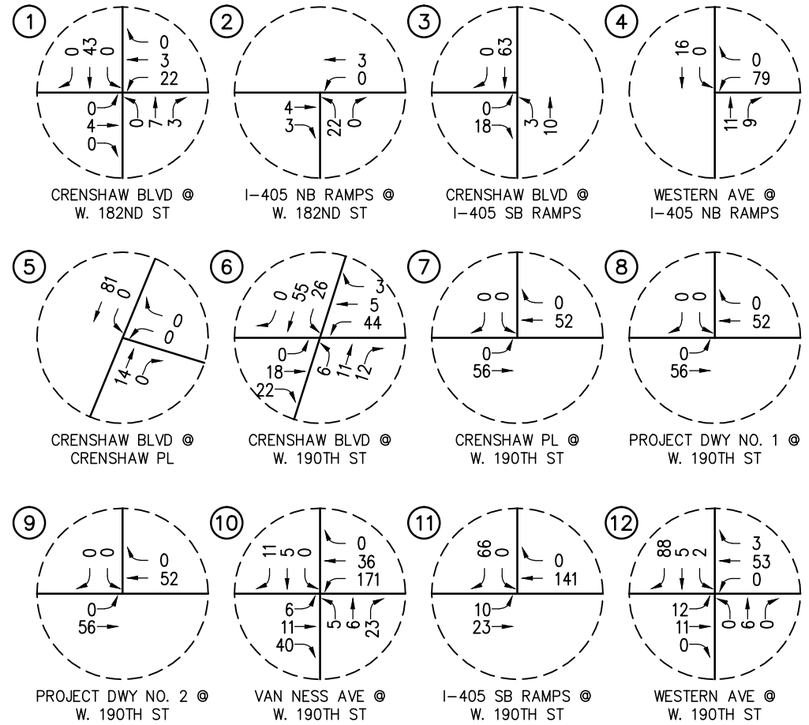
= PROJECT SITE

FIGURE 6–1

CUMULATIVE PROJECTS LOCATION MAP

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

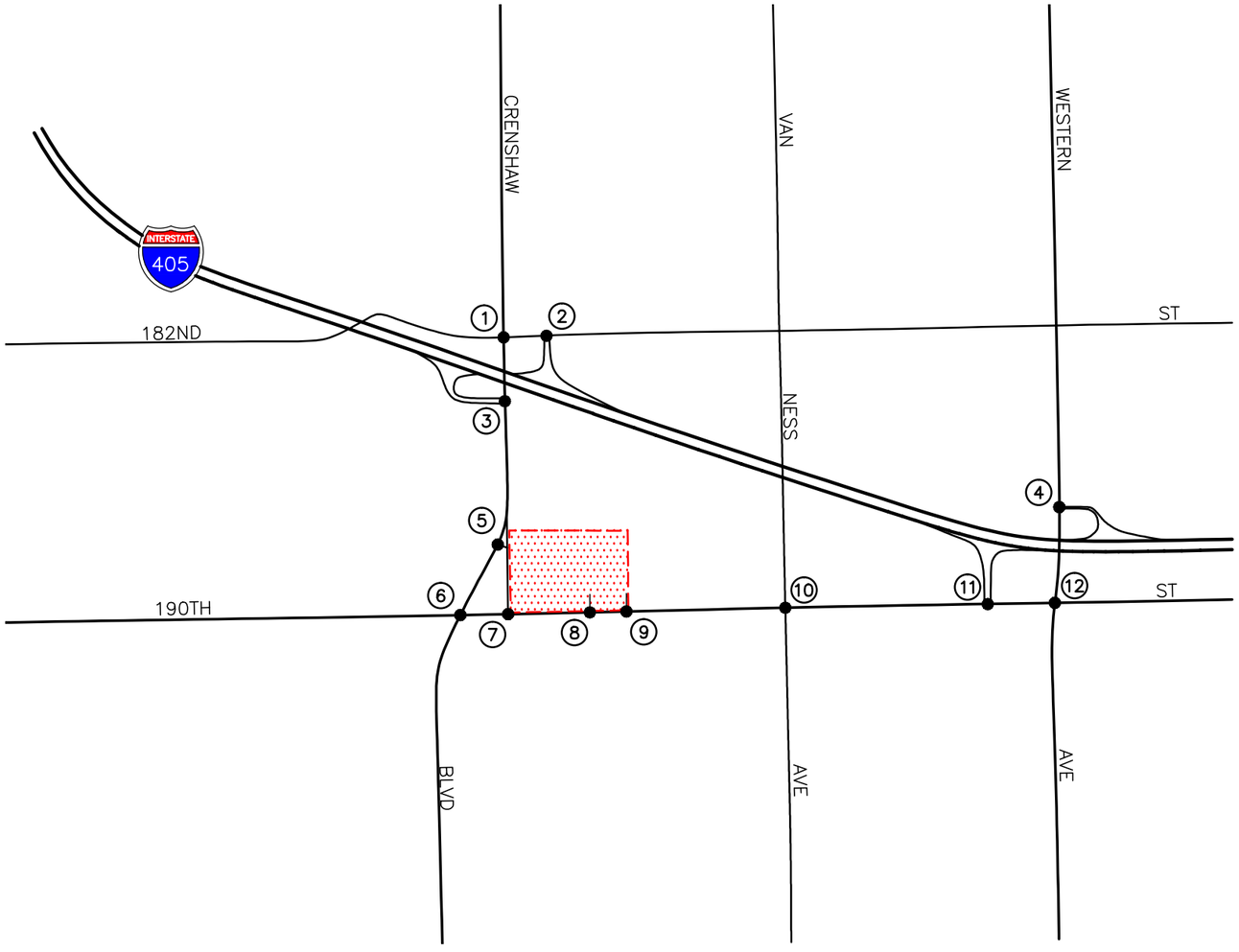
(#) = STUDY INTERSECTION

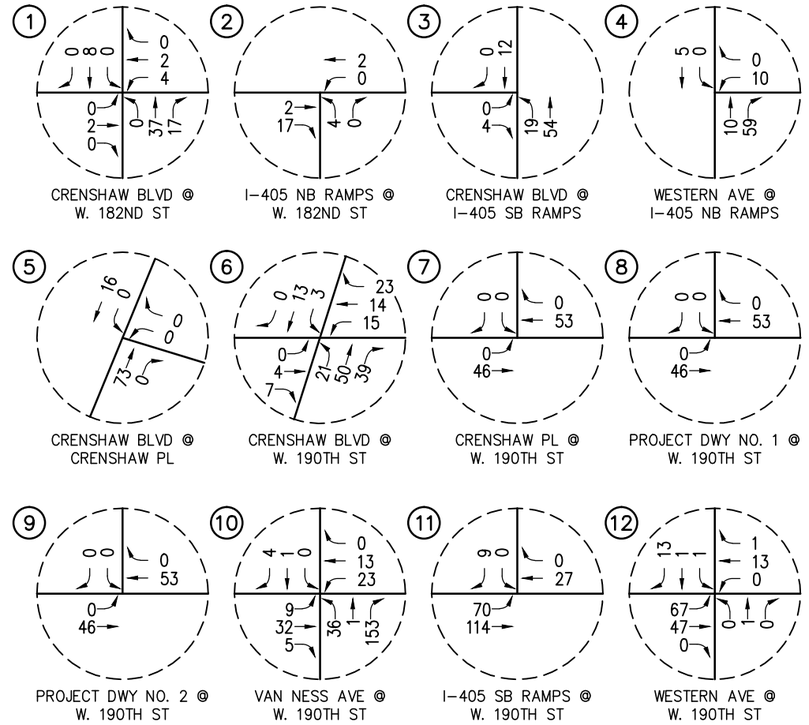
= PROJECT SITE

FIGURE 6-2

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

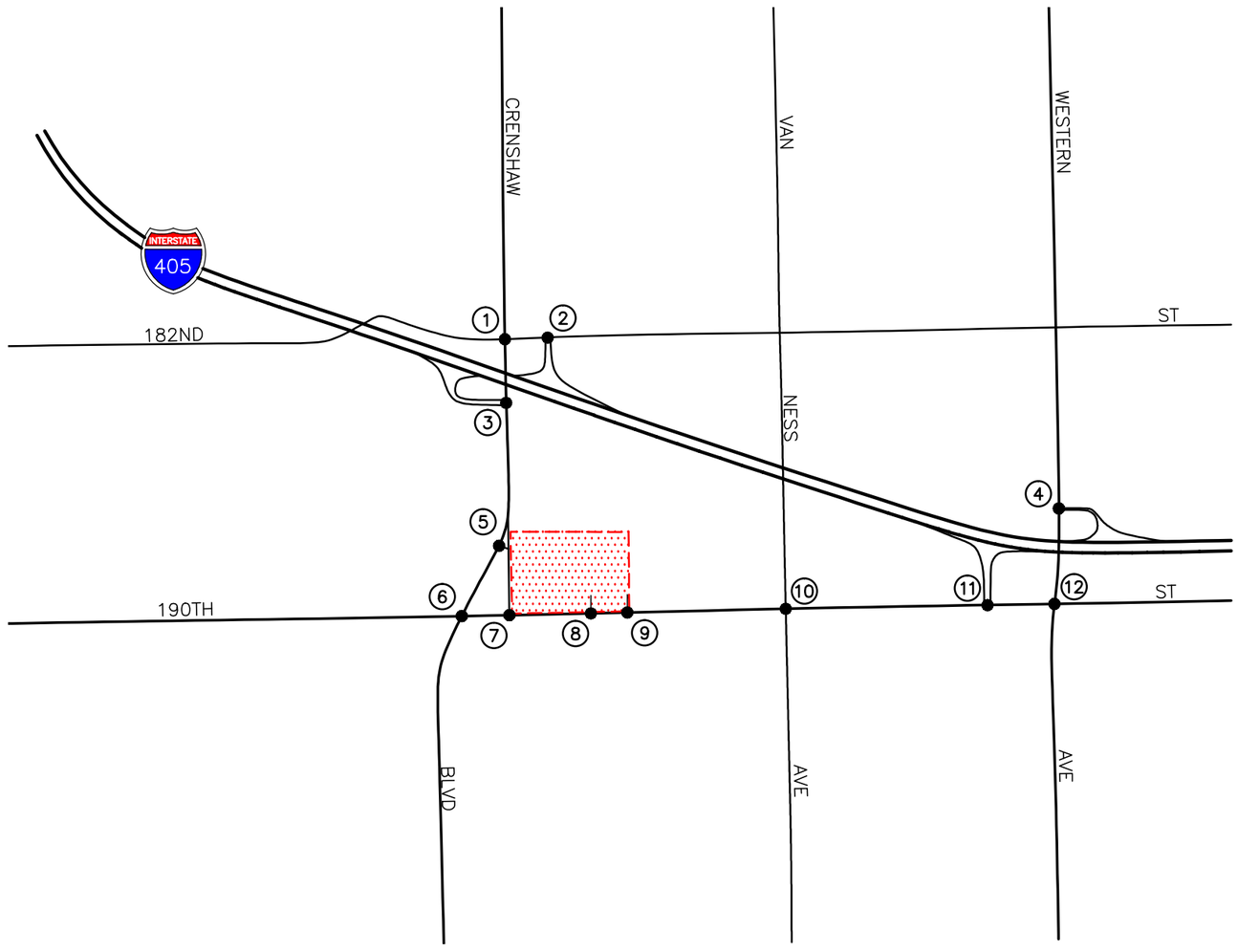
(#) = STUDY INTERSECTION

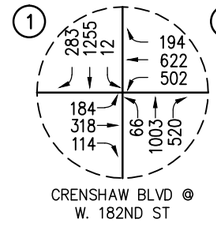
= PROJECT SITE

FIGURE 6-3

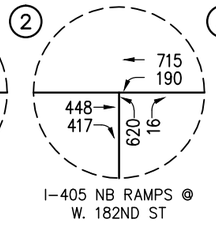
PM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

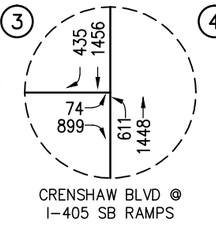




CRENSHAW BLVD @
W. 182ND ST



I-405 NB RAMPS @
W. 182ND ST



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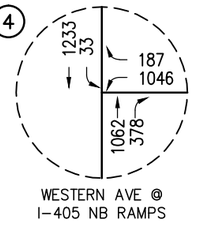
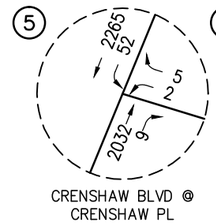
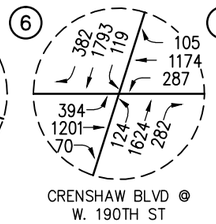
I-405 SB RAMPS



WESTERN AVE @
I-405 NB RAMPS



CRENSHAW BLVD @
CRENSHAW PL



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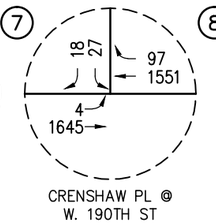
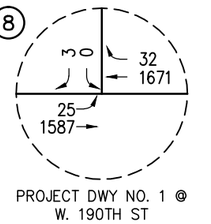
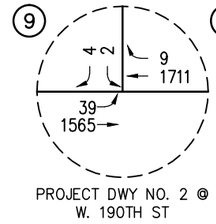
W. 190TH ST



CRENSHAW PL @
W. 190TH ST



PROJECT DWY NO. 1 @
W. 190TH ST



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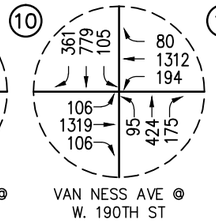
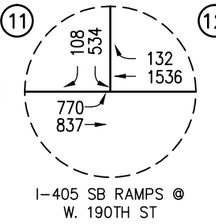
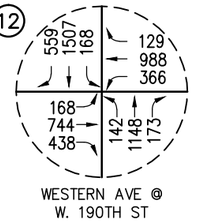


VAN NESS AVE @
W. 190TH ST



I-405 SB RAMPS @
W. 190TH ST



WESTERN AVE @
W. 190TH ST

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

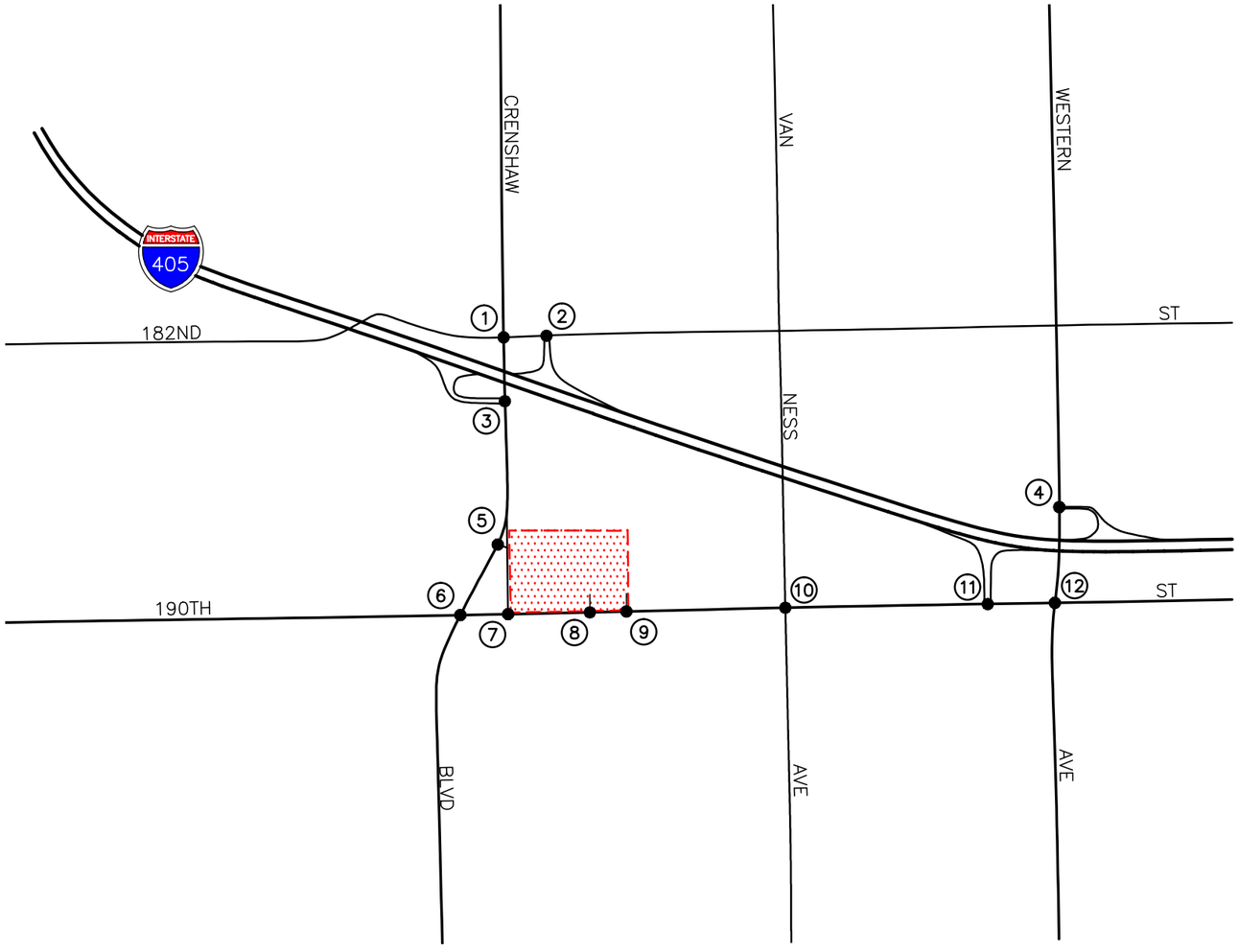
(#) = STUDY INTERSECTION

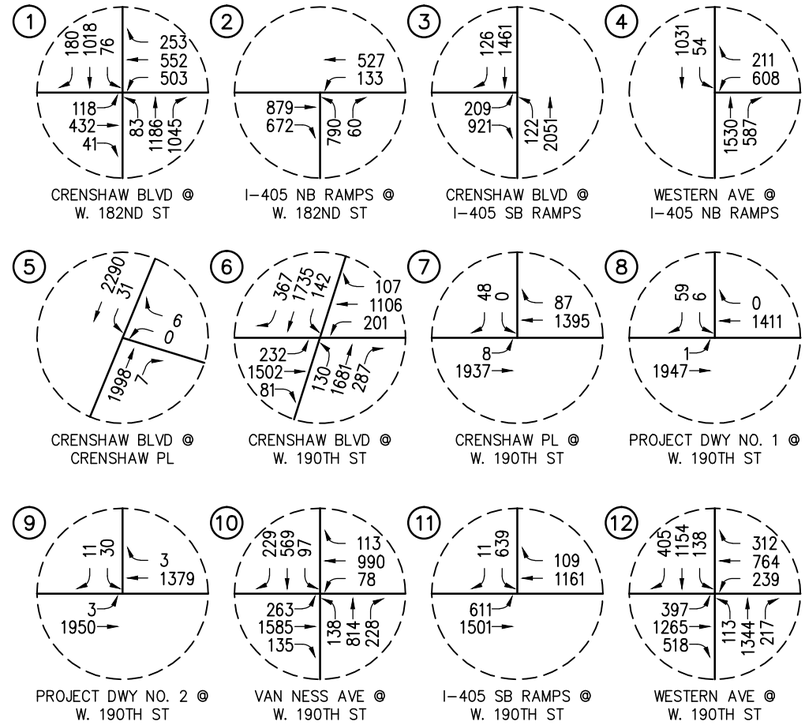
= PROJECT SITE

FIGURE 6-4

EXISTING WITH AMBIENT GROWTH (YEAR 2022) AM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

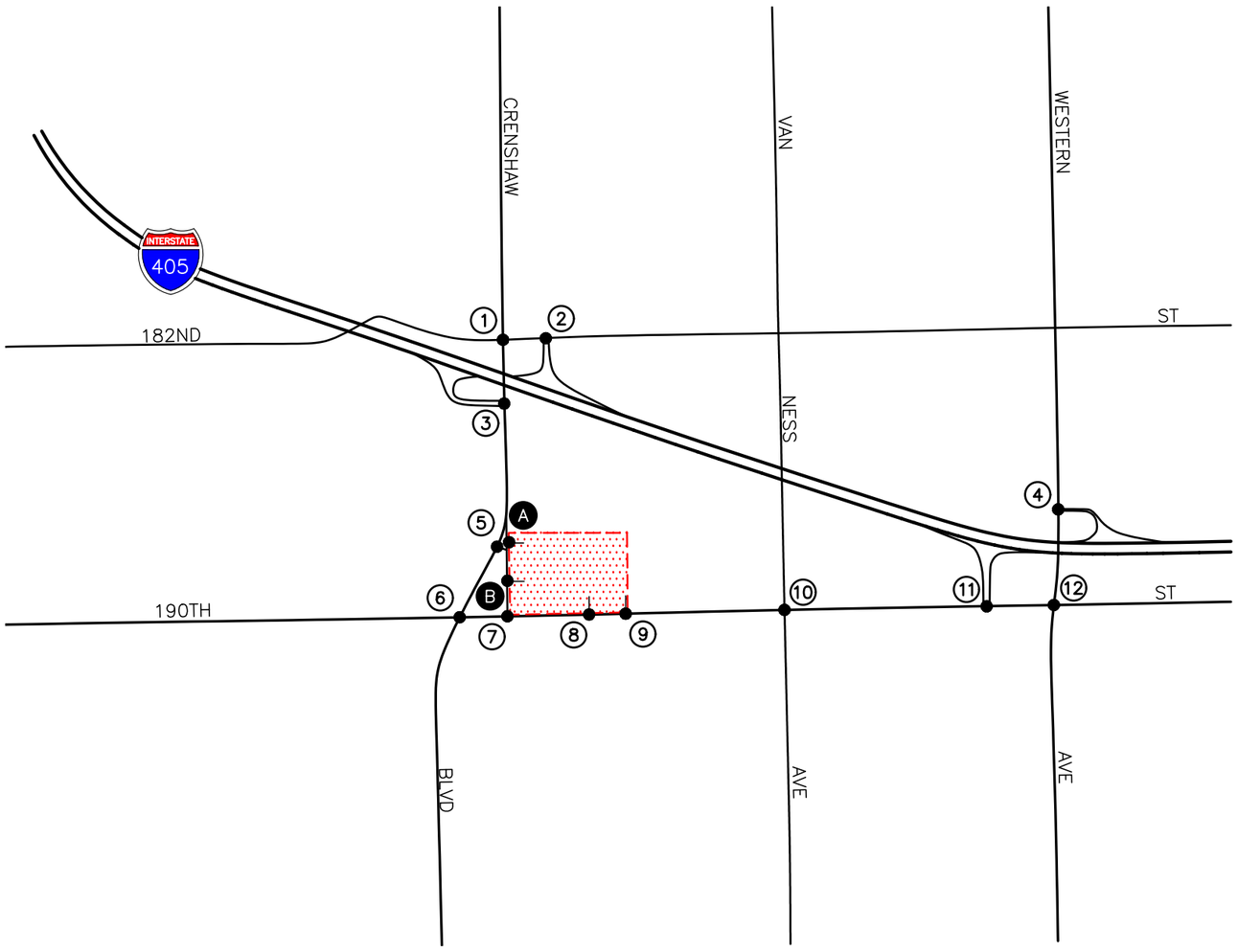
(#) = STUDY INTERSECTION

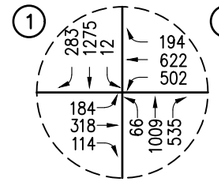
= PROJECT SITE

FIGURE 6-5

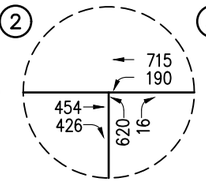
EXISTING WITH AMBIENT GROWTH (YEAR 2022) PM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

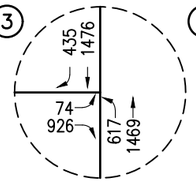




1 CRENSHAW BLVD @ W. 182ND ST



2 I-405 NB RAMPS @ W. 182ND ST



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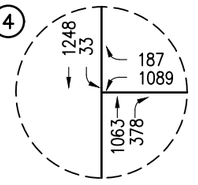
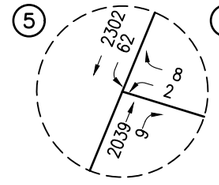
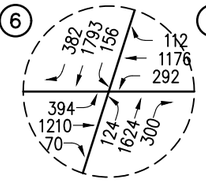


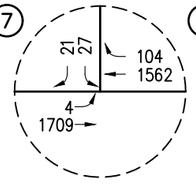
4 WESTERN AVE @ I-405 NB RAMPS



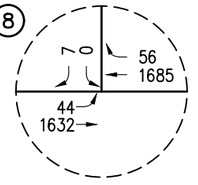
5 CRENSHAW BLVD @ CRENSHAW PL



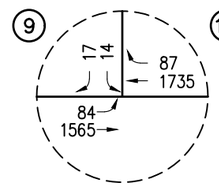
6 CRENSHAW BLVD @ W. 190TH ST



7 CRENSHAW PL @ W. 190TH ST



8 PROJECT DWY NO. 1 @ W. 190TH ST



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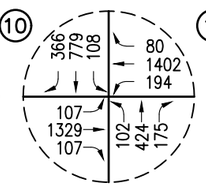
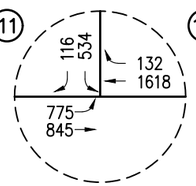
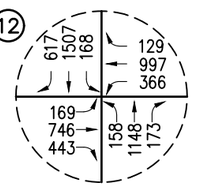


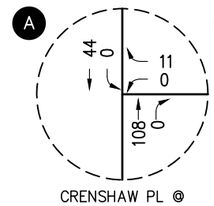
10 VAN NESS AVE @ W. 190TH ST



11 I-405 SB RAMPS @ W. 190TH ST



12 WESTERN AVE @ W. 190TH ST



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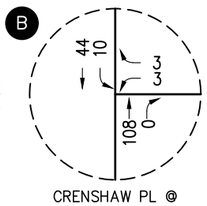


B CRENSHAW PL @ PROJECT DWY NO. 4

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

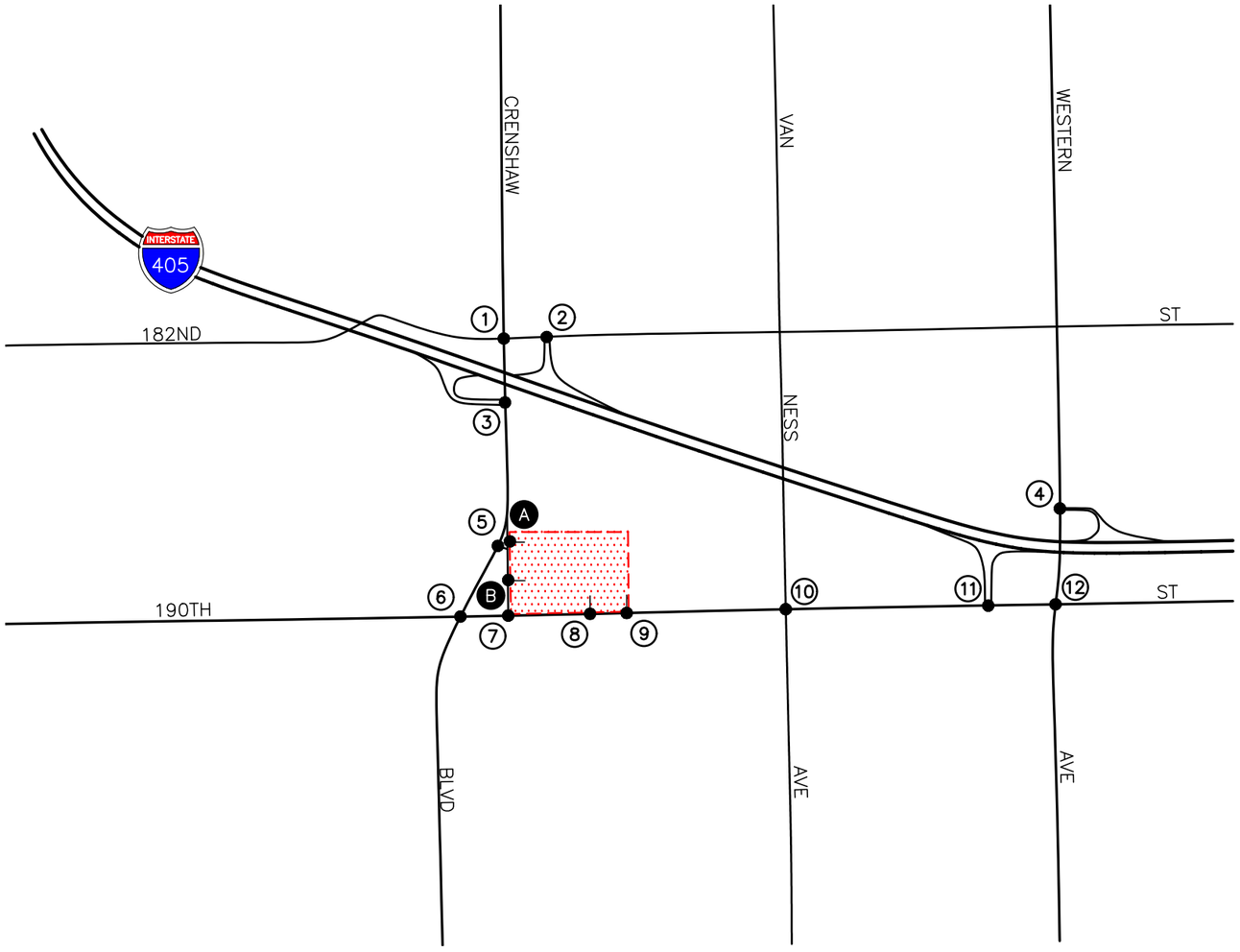
(#) = STUDY INTERSECTION

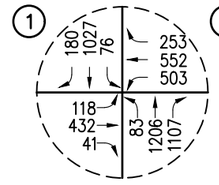
= PROJECT SITE

FIGURE 6-6

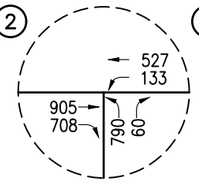
EXISTING WITH AMBIENT GROWTH (YEAR 2022) WITH PROJECT AM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

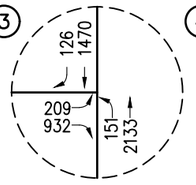




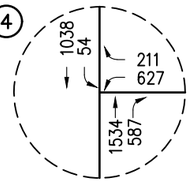
CRENSHAW BLVD @
W. 182ND ST



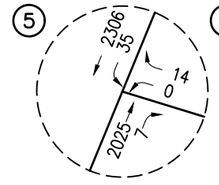
I-405 NB RAMPS @
W. 182ND ST



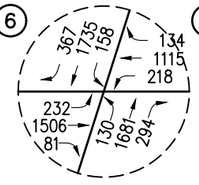
CRENSHAW BLVD @
I-405 SB RAMPS



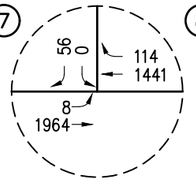
WESTERN AVE @
I-405 NB RAMPS



CRENSHAW BLVD @
CRENSHAW PL



CRENSHAW BLVD @
W. 190TH ST



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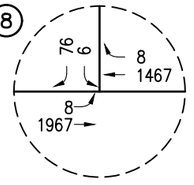
W. 190TH ST



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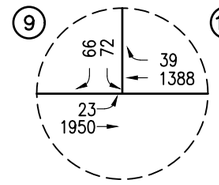
W. 190TH ST



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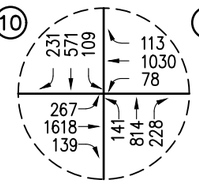
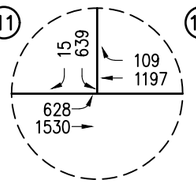
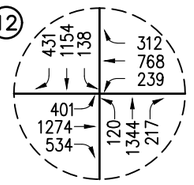


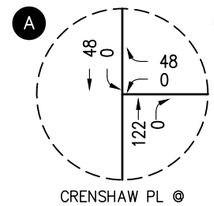
VAN NESS AVE @
W. 190TH ST



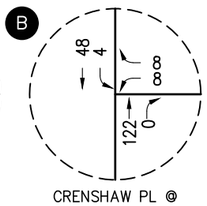
I-405 SB RAMPS @
W. 190TH ST



WESTERN AVE @
W. 190TH ST



CRENSHAW PL @
PROJECT DWY NO. 3



CRENSHAW PL @
PROJECT DWY NO. 4

n:\4100\2194123 - 2555 w. 190th warehouse development, torrance\dwg\4123 f6-7.dwg LDP 11:19:23 06-26-2019 lam

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

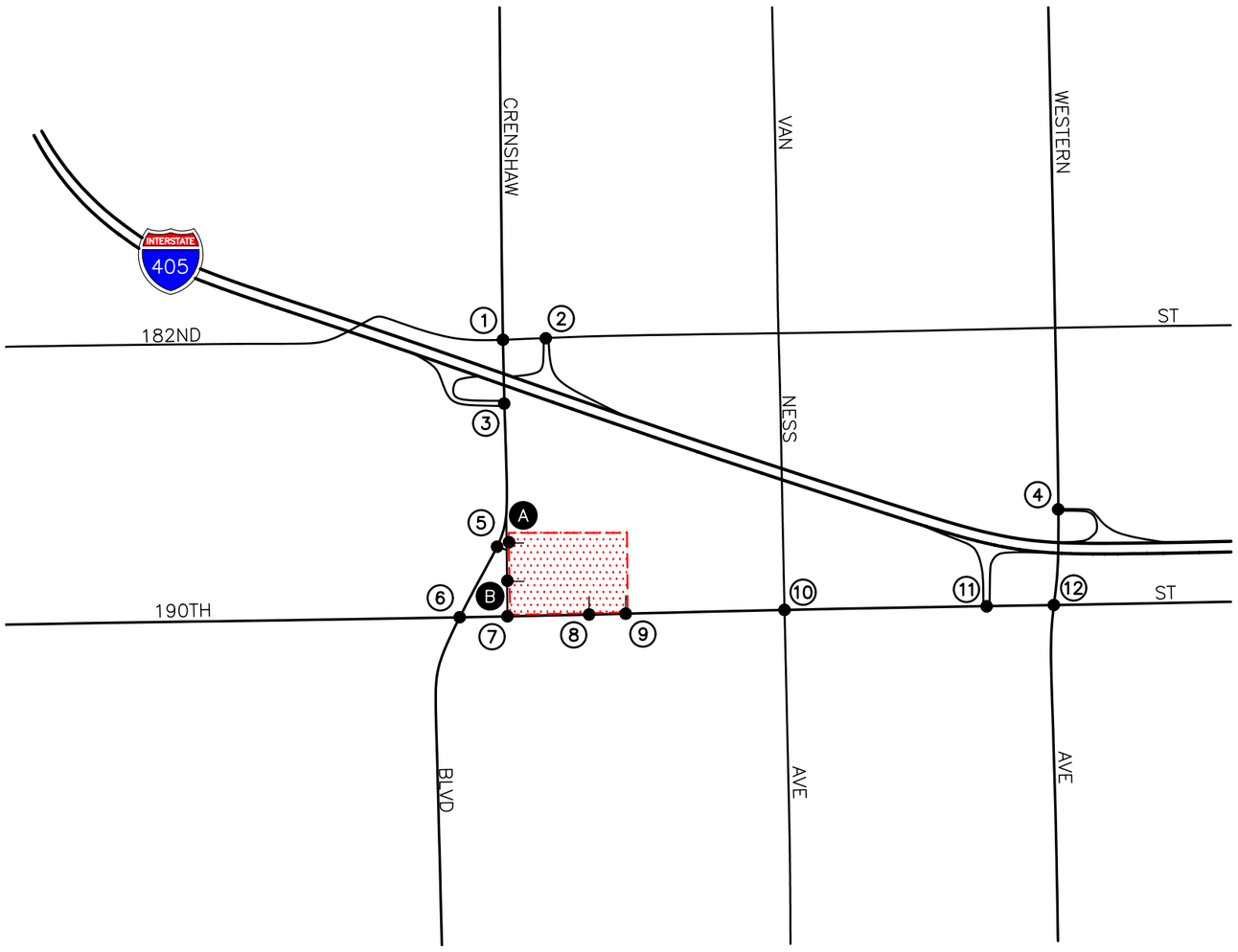
(#) = STUDY INTERSECTION

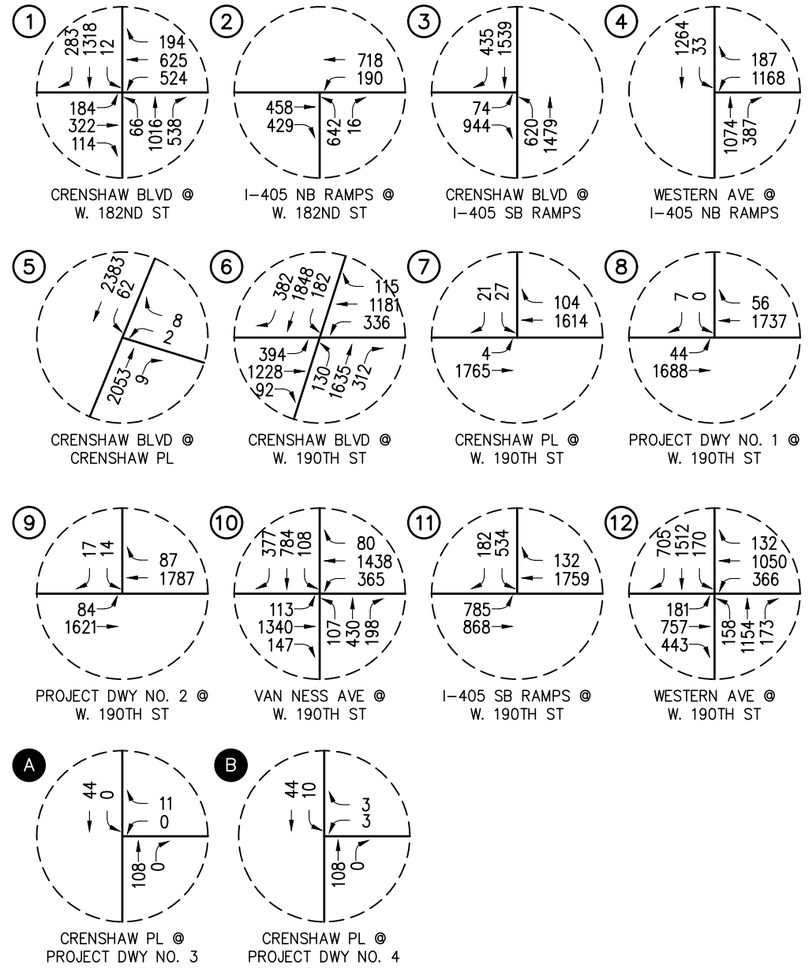
= PROJECT SITE

FIGURE 6-7

EXISTING WITH AMBIENT GROWTH (YEAR 2022) WITH PROJECT PM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

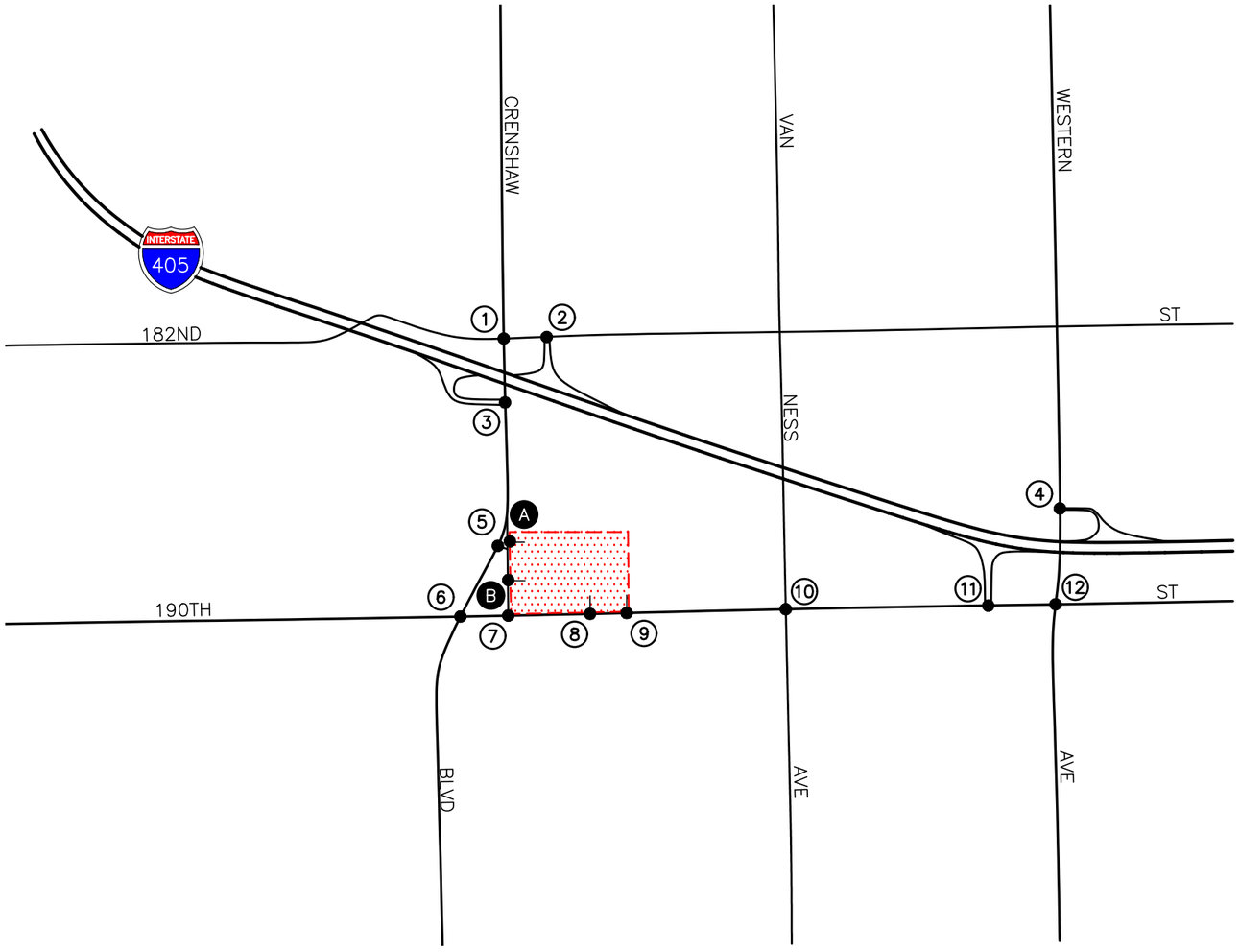
(#) = STUDY INTERSECTION

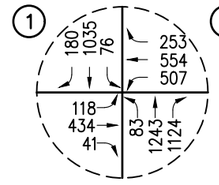
= PROJECT SITE

FIGURE 6-8

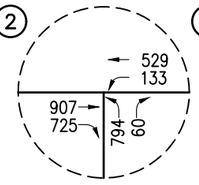
EXISTING WITH AMBIENT GROWTH (YEAR 2022) WITH PROJECT WITH CUMULATIVE PROJECTS AM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

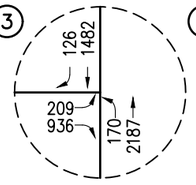




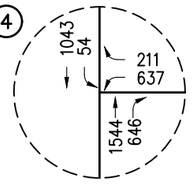
CRENSHAW BLVD @
W. 182ND ST



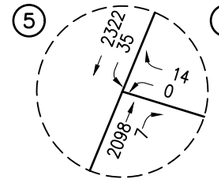
I-405 NB RAMPS @
W. 182ND ST



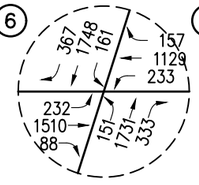
CRENSHAW BLVD @
I-405 SB RAMPS



WESTERN AVE @
I-405 NB RAMPS



CRENSHAW BLVD @
CRENSHAW PL



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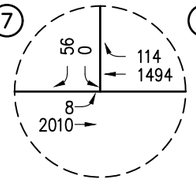
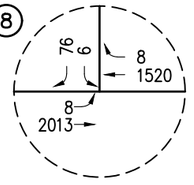
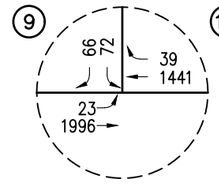
W. 190TH ST



CRENSHAW PL @
W. 190TH ST



PROJECT DWY NO. 1 @
W. 190TH ST



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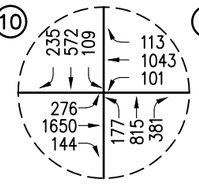
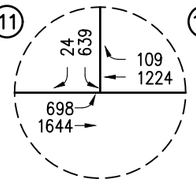
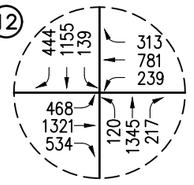
W. 190TH ST



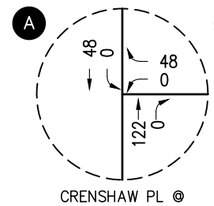
VAN NESS AVE @
W. 190TH ST



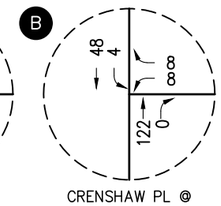
I-405 SB RAMPS @
W. 190TH ST



WESTERN AVE @
W. 190TH ST



CRENSHAW PL @
PROJECT DWY NO. 3



CRENSHAW PL @
PROJECT DWY NO. 4

n:\4100\2194123 - 2555 w. 190th warehouse development, torrance\dwg\4123 f6-9.dwg LDP 11:20:39 06-26-2019 lam

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 6-9

EXISTING WITH AMBIENT GROWTH (YEAR 2022) WITH PROJECT WITH CUMULATIVE PROJECTS PM PEAK HOUR TRAFFIC VOLUMES

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

7.0 YEAR 2022 CONDITIONS TRAFFIC IMPACT ANALYSIS

The relative impacts of the added Project traffic volumes generated by proposed Project during the AM and PM peak hour traffic conditions were evaluated based on analysis of future Year 2022 operating conditions at the twelve (12) key study intersections. The previously discussed capacity analysis procedures were utilized to investigate the future ICU/HCM relationships and service level characteristics at each study intersection. The significance of the potential impacts of the Project at each key intersection was then evaluated using the traffic impact criteria summarized in Section 3.5 of this report.

7.1 Traffic Impact Analysis Scenarios

The following scenarios are those for which AM and PM peak hour volume/capacity and delay calculations have been performed at the key study intersections:

A. Existing Traffic Conditions;
B. Existing Traffic Conditions Plus Ambient Growth Traffic to the Year 2022;
C. Scenario (B) plus Project Traffic Conditions;
D. Scenario (C) with Improvements, if necessary, to off-set Project impacts;
E. Scenario (C) plus Cumulative Projects Traffic Conditions; and
F. Scenario (E) with Improvements, if necessary, to off-set cumulative impacts.

7.2 Year 2022 Conditions Intersection Capacity Analysis

Table 7-1 summarizes the AM and PM peak hour Level of Service results at the key study intersections for Year 2022 traffic conditions, based on the *Intersection Capacity Utilization (ICU)* Method of Analysis for signalized intersections and the *Highway Capacity Manual (HCM)* for unsignalized intersections.

The first column (1) of ICU/HCM/LOS values in *Table 7-1* presents a summary of existing AM and PM peak hour traffic conditions for key study intersections. The second column (2) presents Existing with Ambient Growth traffic conditions based on existing intersection geometry but without any traffic generated from the proposed project. The third column (3) identifies Existing with Ambient Growth traffic conditions with the addition of project traffic. The fourth column (4) shows the increase in ICU/HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria mentioned in this report. The fifth column (5) presents the resultant level of service of Existing With Ambient Growth with Project traffic conditions with the inclusion of planned and/or recommended traffic improvements, if needed.

The sixth column (6) in *Table 7-1* presents Existing With Ambient Growth With Project With Cumulative Project traffic conditions (i.e. the cumulative scenario). The seventh column (7) shows the increase in ICU value due to the added peak hour cumulative traffic, inclusive of Project trips, and indicates whether the cumulative traffic, inclusive of the Project trips, will have a significant cumulative impact based on criteria mentioned in this report. The eighth column (8) presents the

resultant level of service of Existing With Ambient Growth with Project with Cumulative traffic conditions with the inclusion of planned and/or recommended traffic improvements, if needed.

7.2.1 *Existing Traffic Conditions*

Review of column (1) of *Table 7-1* indicates that for existing traffic conditions, six (6) of the twelve (12) signalized study intersections currently operate at unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining signalized study intersections operate at acceptable level of service during the AM and PM peak hours. The intersections operating adversely are as follows:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU	LOS	ICU	LOS
1. Crenshaw Boulevard at W. 182nd Street	--	--	1.049	F
2. I-405 NB ramps at W. 182nd Street	--	--	0.937	E
3. Crenshaw Boulevard at I-405 SB Ramps	1.028	F	1.000	E
5. Crenshaw Boulevard at Crenshaw Place	90.1 s/v	F	--	--
6. Crenshaw Boulevard at W. 190th Street	1.027	F	0.943	E
7. Crenshaw Place at W. 190th Street	64.4 s/v	F	--	--

7.2.2 *Existing With Ambient Growth (Year 2022) Traffic Conditions*

Review of column (2) of *Table 7-1* indicates that for Existing with Ambient Growth traffic conditions, eight (8) of the twelve (12) signalized study intersections are forecast to operate at unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining signalized study intersections operate at acceptable level of service during the AM and PM peak hours. The intersections operating adversely are as follows:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU	LOS	ICU	LOS
1. Crenshaw Boulevard at W. 182nd Street	0.902	E	1.077	F
2. I-405 NB ramps at W. 182nd Street	--	--	0.963	E
3. Crenshaw Boulevard at I-405 SB Ramps	1.056	F	1.027	F
5. Crenshaw Boulevard at Crenshaw Place	108.8 s/v	F	--	--
6. Crenshaw Boulevard at W. 190th Street	1.055	F	0.969	E
7. Crenshaw Place at W. 190th Street	73.9 s/v	F	--	--
10. Van Ness Avenue at W. 190th Street	--	--	0.924	E
11. I-405 SB Ramps at W. 190th St	0.910	E	--	--

7.2.3 *Existing With Ambient Growth (Year 2022) With Project Traffic Conditions*

Review of column (3) of *Table 7-1* indicates that for Existing with Ambient Growth with Project traffic conditions, nine (9) of the twelve (12) signalized study intersections are forecast to continue to operate at unacceptable level of service during the AM and/or PM peak hours, based on the LOS standards and impact criteria specified in this report. The remaining signalized study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely are as follows:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU	LOS	ICU	LOS
1. Crenshaw Boulevard at W. 182nd Street	0.906	E	1.115	F
2. I-405 NB ramps at W. 182nd Street	--	--	0.982	E
3. Crenshaw Boulevard at I-405 SB Ramps	1.077	F	1.033	F
4. Western Avenue at I-405 NB Ramps	--	--	0.904	E
5. Crenshaw Boulevard at Crenshaw Place	105.6 s/v	F	--	--
6. Crenshaw Boulevard at W. 190th Street	1.055	F	0.978	E
7. Crenshaw Place at W. 190th Street	69.8 s/v	F	--	--
10. Van Ness Avenue at W. 190th Street	0.909	E	0.947	E
11. I-405 SB Ramps at W. 190th St	0.932	E	--	--

Review of column (4) of *Table 7-1* indicates that five (5) study intersections are significantly impacted by the Project under the Existing with Ambient Growth with Project traffic conditions, which include Crenshaw Boulevard/W. 182nd Street, I-405 Northbound Ramps/W. 182nd Street, Crenshaw Boulevard/I-405 Southbound Ramps, Van Ness Avenue at W. 190th Street and I-405 Southbound Ramps/W. 190th Street. Review of column (5) indicates that the implementation of planned and/or recommended improvements at the intersections will help offset the Project's impact. Planned and recommended improvements are discussed in Section 10.0.

7.2.4 *Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions*

Review of column (6) of *Table 7-1* indicates that for Existing with Ambient Growth with Project with Cumulative traffic conditions, nine (9) of the twelve (12) signalized study intersections are forecast to continue to operate at unacceptable level of service during the AM and/or PM peak hours. The remaining signalized study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely are as follows:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU	LOS	ICU	LOS
1. Crenshaw Boulevard at W. 182nd Street	0.922	E	1.127	F
2. I-405 NB ramps at W. 182nd Street	--	--	0.990	E
3. Crenshaw Boulevard at I-405 SB Ramps	1.101	F	1.034	F
4. Western Avenue at I-405 NB Ramps	0.927	E	0.911	E
5. Crenshaw Boulevard at Crenshaw Place	114.5 s/v	F	--	--

6. Crenshaw Boulevard at W. 190th Street	1.072	F	0.995	E
7. Crenshaw Place at W. 190th Street	80.2 s/v	F	--	--
10. Van Ness Avenue at W. 190th Street	0.927	E	0.957	E
11. I-405 SB Ramps at W. 190th St	0.988	E	--	--

Review of column (7) of *Table 7-1*, the proposed Project, in combination with cumulative projects traffic, is forecast to cumulatively impact eight (8) study intersections during the AM and/or PM peak hour under the Existing with Ambient Growth with Project with Cumulative traffic conditions when compared to the LOS criteria defined in this report. The impacted intersections include Crenshaw Boulevard/W. 182nd Street, I-405 NB ramps at W. 182nd Street, Crenshaw Boulevard at I-405 SB Ramps, Western Avenue at I-405 NB Ramps, Crenshaw Boulevard at W. 190th Street, Crenshaw Place at W. 190th Street, Van Ness Avenue at W. 190th Street, and I-405 SB Ramps at W. 190th St.

Review of column (8) indicates that the implementation of planned and/or recommended improvements at the intersections will help offset cumulative traffic impacts. Please note that the recommended improvements for the intersection of Western Avenue at 190th Street and Crenshaw Boulevard at W. 190th Street would require additional capacity-enhancing improvements at these two key study intersections that do not appear feasible due to physical and right-of-way restrictions that prohibit any additional widening and/or restriping. Therefore, the cumulative impact at these locations will remain unmitigated. Planned and recommended improvements are discussed in Section 10.0.

Appendix C contains the ICU/LOS calculation worksheets.

TABLE 7-1

YEAR 2022 CONDITIONS PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection	Time Period	(1) Existing Traffic Conditions		(2) Existing With Ambient Growth (Year 2022) Traffic Conditions		(3) Existing With Ambient Growth (Year 2022) With Project Traffic Conditions		(4) Significant Impact (3) – (2)		(5) Existing With A.G. (Year 2022) With Project With Mitigation		(6) Existing With A.G. (Year 2022) With Project With Cumulative Traffic Conditions		(7) Year 2022 Cumulative Impact (6) – (2)		(8) Existing With A.G. (Year 2022) With Project With Cumulative With Mitigation	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Crenshaw Boulevard at	AM	0.878	D	**0.902**	**E**	**0.906**	**E**	0.004	No	0.841	D[8]	**0.922**	**E**	**0.020**	**Yes**	0.856	D[8]
W. 182nd Street	PM	**1.049**	**F**	**1.077**	**F**	**1.115**	**F**	**0.038**	**Yes**	0.893	D[8]	**1.127**	**F**	**0.050**	**Yes**	**0.905**	**E**[8]
2. I-405 Northbound Ramps at	AM	0.692	B	0.710	C	0.715	C	0.005	No	0.576	A[8]	0.724	C	0.014	No	0.585	A[8]
W. 182nd Street	PM	**0.937**	**E**	**0.963**	**E**	**0.982**	**E**	**0.019**	**Yes**	0.740	C[8]	**0.990**	**E**	**0.027**	**Yes**	0.742	C[8]
3. Crenshaw Boulevard at	AM	**1.028**	**F**	**1.056**	**F**	**1.077**	**F**	**0.021**	**Yes**	0.775	C[8]	**1.101**	**F**	**0.045**	**Yes**	0.783	C[8]
I-405 Southbound Ramps	PM	**1.000**	**E**	**1.027**	**F**	**1.033**	**F**	0.006	No	0.836	D[8]	**1.034**	**F**	0.007	No	0.848	D[8]
4. Western Avenue at	AM	0.858	D	0.881	D	0.896	D	0.015	No	--	--	**0.927**	**E**	**0.046**	**Yes**	0.862	D
I-405 Northbound Ramps	PM	0.873	D	0.896	D	**0.904**	**E**	0.008	No	--	--	**0.911**	**E**	**0.015**	**Yes**	0.837	D
5. Crenshaw Boulevard at	AM	**90.1 s/v**	**F**	**108.8 s/v**	**F**	**105.6 s/v**	**F**	0.0 s/v[9]	No	--	--	**114.5 s/v**	**F**	5.7 s/v	No	--	--
Crenshaw Place	PM	22.1 s/v	C	22.9 s/v	C	24.1 s/v	C	1.2 s/v	No	--	--	25.3 s/v	D	2.4 s/v	No	--	--
6. Crenshaw Boulevard at	AM	**1.027**	**F**	**1.055**	**F**	**1.055**	**F**	0.000	No	--	--	**1.072**	**F**	**0.017**	**Yes**	**N.F.**	**N.F.**[10]
W. 190th Street	PM	**0.943**	**E**	**0.969**	**E**	**0.978**	**E**	0.009	No	--	--	**0.995**	**E**	**0.026**	**Yes**	**N.F.**	**N.F.**Error! Bookmark not defined.
7. Crenshaw Place at	AM	**64.4 s/v**	**F**	**73.9 s/v**	**F**	**69.8 s/v**	**F**	0.0 s/v[9]	No	--	--	**80.2 s/v**	**F**	6.3 s/v	No	--	--
W. 190th Street	PM	18.3 s/v	C	18.9 s/v	C	18.8 s/v	C	0.0 s/v[9]	No	--	--	19.4 s/v	C	0.5 s/v	No	--	--
8. Project Driveway 1 at	AM	18.5 s/v	C	19.0 s/v	C	19.6 s/v	C	0.6 s/v	No	--	--	20.3 s/v	C	1.3 s/v	No	--	--
W. 190th Street	PM	20.6 s/v	C	21.4 s/v	C	23.5 s/v	C	2.1 s/v	No	--	--	24.8 s/v	C	3.4 s/v	No	--	--
9. Project Driveway 2 at	AM	0.474	A	0.485	A	0.543	A	0.058	No	--	--	0.554	A	0.069	No	--	--
W. 190th Street	PM	0.513	A	0.525	A	0.551	A	0.026	No	--	--	0.561	A	0.036	No	--	--
10. Van Ness Avenue at	AM	0.855	D	0.878	D	**0.909**	**E**	**0.031**	**Yes**	0.777	C	**0.927**	**E**	**0.049**	**Yes**	0.889	D
W. 190th Street	PM	0.900	D	**0.924**	**E**	**0.947**	**E**	**0.023**	**Yes**	0.828	D	**0.957**	**E**	**0.033**	**Yes**	0.836	D
11. I-405 Southbound Ramps at	AM	0.887	D	**0.910**	**E**	**0.932**	**E**	**0.022**	**Yes**	0.857	D	**0.988**	**E**	**0.078**	**Yes**	0.878	D
W. 190th Street	PM	0.760	C	0.780	C	0.795	C	0.015	No	0.719	C	0.828	D	**0.048**	**Yes**	0.751	C
12. Western Avenue at	AM	0.794	C	0.815	D	0.831	D	0.016	No	--	--	0.882	D	**0.067**	**Yes**	**N.F.**	**N.F.**[11]
W. 190th Street	PM	0.775	C	0.795	C	0.803	D	0.008	No	--	--	0.819	D	**0.024**	**Yes**	**N.F.**	**N.F.**[11]

Notes:

- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Tables 3-1* and *3-2* for the LOS definitions
- **Bold ICU/HCM/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report
- **N.F. = Not Feasible**

[8] Improvements are based on the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*, which has since been approved and is now funded. As part of the planned improvements, shifts in traffic volumes have been applied to accommodate the new proposed lane geometries.

[9] A theoretical negative increase is due to additional traffic volumes that are added to non-critical movements.

[10] Please note that restriping the existing westbound right-turn lane into a shared through/right-turn lane and restriping the departure lanes to include a third through lane was considered as mitigation improvements, generally consistent with the *Citywide Traffic Analysis* prepared by Albert Grover & Associates, dated March 21, 2019. However, based on discussions with City staff, it was deemed that these improvements are infeasible on a near-term basis.

[11] Please note that constructing a second southbound right-turn lane and exclusive westbound right-turn lane was considered as mitigation improvements. However, based on discussions with City staff, it was deemed these improvements are infeasible on a near-term basis due to needed acquirement of additional right-of-way acquisition.

8.0 STATE OF CALIFORNIA (CALTRANS) ASSESSMENT

In conformance with the current Caltrans *Guide for the Preparation of Traffic Impact Studies, dated December 2002*, existing and projected peak hour operating conditions at the four (4) state-controlled study intersections within the study area have been evaluated using the *Highway Capacity Manual* operations method of analysis. These state-controlled locations include the following study intersections:

2. I-405 Northbound Ramps at 182nd Street (Torrance/Caltrans)
3. Crenshaw Boulevard at I-405 Southbound Ramps (Torrance/Caltrans)
4. Western Avenue at I-405 Northbound Ramps (Torrance/Caltrans)
11. I-405 Southbound Ramps at W. 190th Street (Torrance/Caltrans)

Caltrans "endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities"; it does not require that LOS "D" (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. For this analysis, LOS D is the target level of service standard and will be utilized to assess the project impacts at the state-controlled study intersections.

The Caltrans *Guide for the Preparation of Traffic Impact Studies, dated December 2002* states that if an existing State-owned facility operates at less than the target LOS (i.e. LOS D); the existing service level should be maintained. Based on Caltrans Criteria, a Project's impact is considered significant if the Project causes the LOS to change from an acceptable LOS (i.e., LOS D or better) to a deficient LOS (i.e. LOS E or F).

8.1 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)

Based on the HCM 6th Edition operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents and when there are no other vehicles on the road.

In the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 8-1***.

TABLE 8-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[12]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	$\leq$ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and $\leq$ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and $\leq$ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and $\leq$ 55.0	Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and $\leq$ 80.0	Very long traffic delays. This level is considered by many agencies (i.e. SANBAG) to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	$\geq$ 80.0	Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

[12] Source: *Highway Capacity Manual* (Signalized Intersections).

8.2 Year 2022 Conditions Intersection Capacity Analysis

Table 8-2 summarizes the AM and PM peak hour Level of Service results at the four (4) state-controlled study intersections for Year 2022 traffic conditions, based on the *Highway Capacity Manual (HCM)* Method of Analysis. The first column (1) of Delay/LOS values in *Table 8-2* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) identifies Existing with Ambient Growth traffic conditions with the addition of project traffic. The third column (3) indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria mentioned in this report. The fourth column (4) presents the resultant level of service of Existing With Ambient Growth with Project traffic conditions with the inclusion of planned and/or recommended traffic improvements, if needed. The fifth column (5) presents Existing With Ambient Growth With Cumulative Project traffic conditions (i.e. the cumulative scenario). The sixth column (6) presents Existing With Ambient Growth With Project With Cumulative Project traffic conditions. The seventh column (7) indicates whether the traffic associated with the Project will have a significant impact based on the significant "cumulative" impact criteria mentioned in this report. The eighth column (8) presents the resultant level of service of Existing With Ambient Growth with Project with Cumulative traffic conditions with the inclusion of planned and/or recommended traffic improvements, if needed.

8.2.1 *Existing Traffic Conditions*

Review of column (1) of *Table 8-2* indicates that for existing traffic conditions, all four (4) state-controlled study intersections currently operate at acceptable level of service D or better during the AM and PM peak hours.

8.2.2 *Existing With Ambient Growth (Year 2022) With Project Traffic Conditions*

Review of column (2) of *Table 8-2* indicates that for Existing with Ambient Growth with Project traffic conditions, all four (4) state-controlled study intersections are forecast to operate at acceptable level of service D or better during the AM and PM peak hours. Review of column (3) indicates that the proposed Project is not anticipated to create any significant impacts at any of the state-controlled study intersections. Since there are no significant impacts, no improvements are recommended.

8.2.3 *Existing With Ambient Growth (Year 2022) With Cumulative Traffic Conditions*

Review of column (5) of *Table 8-2* indicates that for Existing with Ambient Growth with Cumulative traffic conditions, all four (4) state-controlled study intersections are forecast to operate at acceptable level of service D or better during the AM and PM peak hours.

8.2.4 *Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions*

Review of column (6) of *Table 8-2* indicates that for Existing with Ambient Growth with Project with Cumulative traffic conditions, all four (4) state-controlled study intersections are forecast to operate at acceptable level of service D or better during the AM and PM peak hours. Review of column (7) indicates that the proposed Project is not anticipated to create any significant impacts at

any of the state-controlled study intersections. Since there are no significant impacts, no improvements are recommended.

Appendix D contains the HCM/LOS calculation worksheets for the Year 2022 Traffic Conditions.

TABLE 8-2

YEAR 2022 CONDITIONS PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY – CALTRANS

Key Intersection	Time Period	(1) Existing Traffic Conditions		(2) Existing With Ambient Growth (Year 2022) With Project Traffic Conditions		(3) Significant Impact	(4) Existing With A.G. (Year 2022) With Project With Mitigation		(5) Existing With A.G. (Year 2022) With Cumulative Traffic Conditions		(6) Existing With A.G. (Year 2022) With Project With Cumulative Traffic Conditions		(7) Significant Impact	(8) Existing With A.G. (Year 2022) With Project With Cumulative With Mitigation	
		HCM	LOS	HCM	LOS	Yes/No	HCM	LOS	HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
2. I-405 Northbound Ramps at W. 182nd Street	AM	15.4 s/v	B	15.5 s/v	B	No	--	--	15.8 s/v	B	15.8 s/v	B	No	--	--
	PM	20.4 s/v	C	22.4 s/v	C	No	--	--	22.5 s/v	C	23.5 s/v	C	No	--	--
3. Crenshaw Boulevard at I-405 Southbound Ramps	AM	40.6 s/v	D	46.2 s/v	D	No	--	--	46.9 s/v	D	49.2 s/v	D	No	--	--
	PM	27.7 s/v	C	39.9 s/v	D	No	--	--	47.4 s/v	D	53.8 s/v	D	No	--	--
4. Western Avenue at I-405 Northbound Ramps	AM	19.9 s/v	B	21.2 s/v	C	No	--	--	21.8 s/v	C	22.5 s/v	C	No	--	--
	PM	16.7 s/v	B	17.8 s/v	B	No	--	--	17.9 s/v	B	18.3 s/v	B	No	--	--
11. I-405 Southbound Ramps at W. 190th Street	AM	24.7 s/v	C	26.3 s/v	C	No	--	--	28.6 s/v	C	32.1 s/v	C	No	--	--
	PM	20.7 s/v	C	21.2 s/v	C	No	--	--	21.7 s/v	C	22.0 s/v	C	No	--	--

Notes:

- HCM = Highway Capacity Manual
- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Table 8-1* for the LOS definitions

8.3 Off-Ramp Queueing Assessment

A queueing analysis was prepared for all the I-405 off-ramps to determine if the off-ramp queues spillover into the freeway mainline. This evaluation utilized the HCM 95th percentile methodology. The 95th percentile vehicle queue value corresponds to a condition that is generally taken as the maximum queue for the indicated movement and is presented with each turn movement at the key intersections.

Table 8-3 presents the queueing analyses results at the freeway off-ramps for the AM and PM peak hours for Year 2022 traffic conditions. Column (1) presents results for Existing traffic conditions, column (2) presents results for Existing with Ambient Growth with Project traffic conditions, column (3) presents results for Existing with Ambient Growth with Cumulative traffic conditions, and column (4) presents results for Existing with Ambient Growth with Project with Cumulative traffic conditions.

8.3.1 *Existing Traffic Conditions*

Review of Column (1) of *Table 8-3* indicates that the queues are adequate under Existing traffic conditions during both the AM and PM peak hours. Therefore, no mitigation is required at the four (4) key study locations.

8.3.2 *Existing With Ambient Growth (Year 2022) With Project Traffic Conditions*

Review of Column (2) of *Table 8-3* indicates that the queues are adequate under Existing with Ambient Growth with Project traffic conditions during both the AM and PM peak hours. Therefore, no mitigation is required at the four (4) key study locations.

8.3.3 *Existing With Ambient Growth (Year 2022) With Cumulative Traffic Conditions*

Review of Column (3) of *Table 8-3* indicates that the queues are adequate under Existing with Ambient Growth with Cumulative traffic conditions during both the AM and PM peak hours. Therefore, no mitigation is required at the four (4) key study locations.

8.3.4 *Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions*

Review of Column (4) of *Table 8-3* indicates that the queues are adequate under Existing with Ambient Growth with Project with Cumulative traffic conditions during both the AM and PM peak hours. Therefore, no mitigation is required at the four (4) key study locations.

Appendix D contains the Year 2022 Traffic Conditions queuing worksheets.

TABLE 8-3
CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[13]

Key Study Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing With Ambient Growth (Year 2022) With Project Traffic Conditions				(3) Existing With A.G. (Year 2022) With Cumulative Traffic Conditions				(4) Existing With A.G. (Year 2022) With Project With Cumulative Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
2. I-405 Northbound Ramps at W. 182nd Street																	
Northbound Left-Turn	435’	281’	Yes	346’	Yes	287’	Yes	353’	Yes	294’	Yes	366’	Yes	294’	Yes	366’	Yes
Northbound Shared Left/Right-Turn	435’	280’	Yes	346’	Yes	286’	Yes	353’	Yes	293’	Yes	368’	Yes	293’	Yes	368’	Yes
3. Crenshaw Boulevard at I-405 Southbound Ramps																	
Eastbound Shared Left/Right-Turn	295’	80’	Yes	174’	Yes	88’	Yes	143’	Yes	84’	Yes	134’	Yes	89’	Yes	134’	Yes
Eastbound Right-Turn	1,270’[14]	933’	Yes	699’	Yes	1,116’	Yes	826’	Yes	1,075’	Yes	810’	Yes	1,217’	Yes	840’	Yes
4. Western Avenue at I-405 Northbound Ramps																	
Westbound Left-Turn	230’	431’	Yes[15]	324’	Yes[15]	453’	Yes[15]	335’	Yes[15]	463’	Yes[15]	349’	Yes[15]	476’	Yes[15]	354’	Yes[15]
Westbound Shared Left/Right-Turn	1,200’[16]	446’	Yes	318’	Yes	470’	Yes	332’	Yes	481’	Yes	345’	Yes	494’	Yes	351’	Yes
11. I-405 Southbound Ramps at W. 190th Street																	
Southbound Left-Turn	290’	288’	Yes	300’	Yes[15]	300’	Yes[15]	309’	Yes[15]	328’	Yes[15]	316’	Yes[15]	377’	Yes[15]	324’	Yes[15]
Southbound Shared Left/Right-Turn	955’[17]	281’	Yes	299’	Yes	293’	Yes	308’	Yes	320’	Yes	315’	Yes	368’	Yes	323’	Yes

[13] Queues are based on HCM 95th Percentile methodology.

[14] The eastbound right-turn pocket is striped for 295-feet; however, the on-ramp has the capacity to accommodate additional 975-feet of queue.

[15] Although the queue exceeds the striped storage, the on-ramp has the capacity to accommodate the additional spillover queue.

[16] The westbound shared left/right-turn pocket is striped for 230-feet; however, the on-ramp has the capacity to accommodate additional 970-feet of queue.

[17] The southbound shared left/right-turn pocket is striped for 290-feet; however, the on-ramp has the capacity to accommodate additional 665-feet of queue.

9.0 SITE ACCESS EVALUATION

9.1 Site Access

Vehicular access to the Project site will be provided via the existing unsignalized full access driveway (Project Driveway 1) and signalized full access driveway (Project Driveway 2) located along W. 190th Street, a third unsignalized full access "gated access" driveway on Crenshaw Place (Project Driveway 3), and a fourth unsignalized located on Crenshaw Place (Project Driveway 4).

Table 9-1 presents the level of service results at the four (4) project driveways for Existing with Ambient Growth with Project with Cumulative traffic conditions. Review of the *Table 9-1* indicates that the driveways are forecast to operate at acceptable levels of service in the AM and PM peak hours. In addition, inbound queues into the project site are projected to be minimal and therefore it is noted that dedicated right-turn pockets at the project driveways are not required.

Appendix C contains the ICU/HCM/LOS calculation worksheets for Year 2022 Traffic Conditions at the Project Driveways.

9.2 Internal Circulation

The Project driveways on W. 190th Street and Crenshaw Place will provide access to the subject property for various types of trucks and passenger vehicles. On-site circulation was evaluated for a fire truck and full-sized trucks (WB-67) and was performed using the *Turning Vehicle Templates*, developed by Jack E. Leisch & Associates and *AutoTURN for AutoCAD* computer software that simulates turning maneuvers for various types of vehicles.

Figures 9-1 and ***9-2*** illustrates the turning movements required of a fire truck and WB-67 as it accesses and circulates through the site, respectively. Review of *Figure 9-1* shows that access to and from the site via a fire truck is generally considered adequate. Review of *Figure 9-2A and 9-2B* shows that access to and from the site via WB-67 is generally considered adequate, however, it is recommended to modify the north-west and north-east curb radii at Project Driveway 2 to a minimum of 35-feet in order to accommodate the truck's turning radius; the truck turning requirements of WB-50 or smaller delivery trucks can be accommodated without issue/conflict.

9.3 Sight Distance Evaluation

At intersections and/or project driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. A sight distance evaluation has been performed for both project driveways.

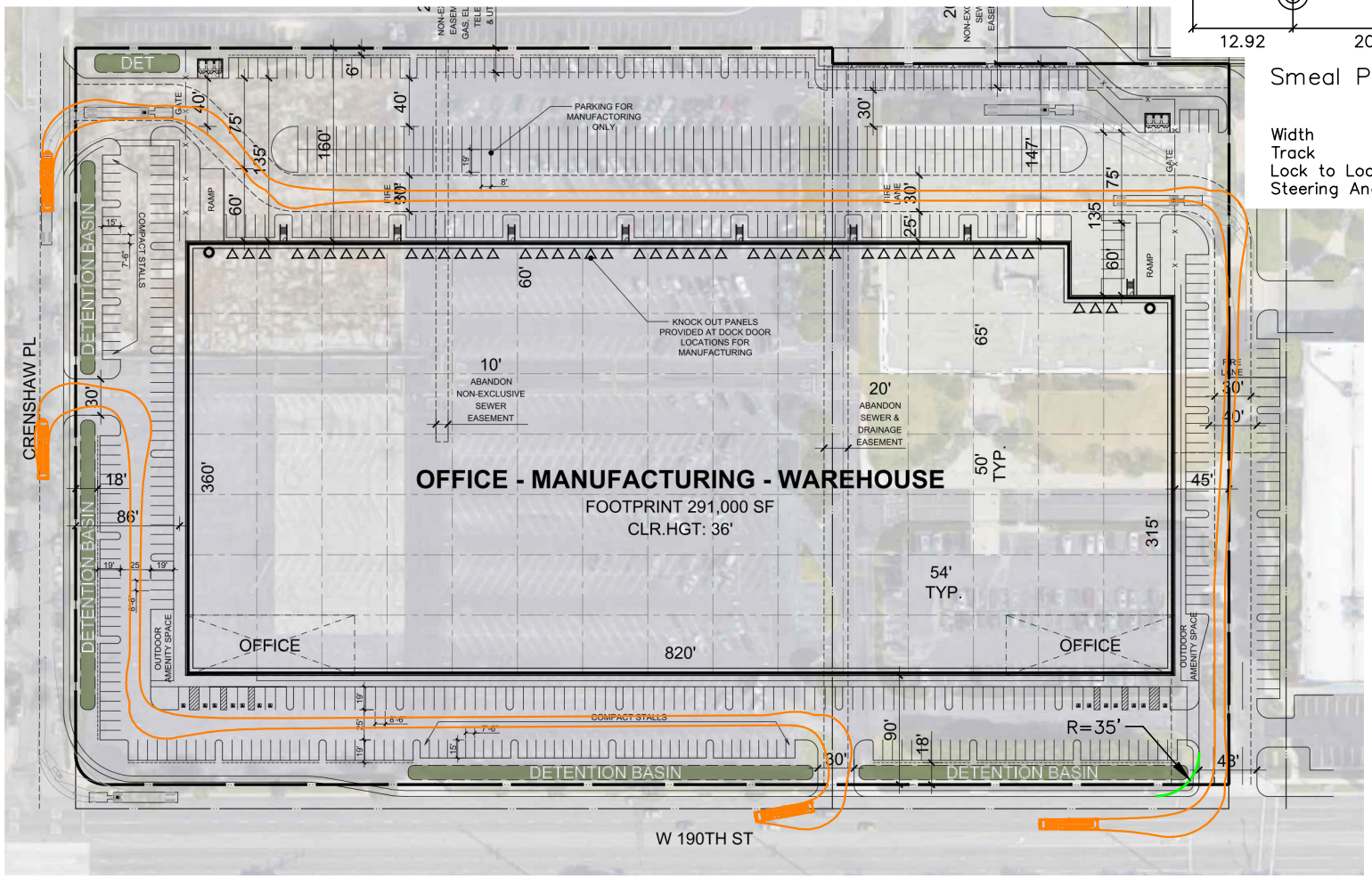
The Sight Distance Evaluation prepared for the project driveways are based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual (HDM)*. Corner sight distance was utilized for the evaluation. Corner sight distance is defined in the Caltrans HDM to be the distance required by the driver of a vehicle,

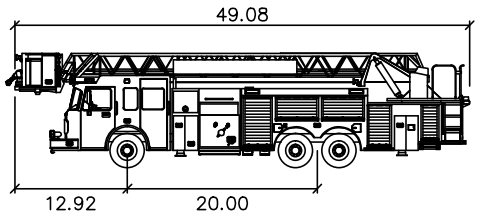
traveling at a given speed, to maneuver their vehicle and avoid an object without radically altering their speed. Line of sight for corner sight distance is to be determined from a 3½ foot height at the location of the driver of a vehicle on a minor road to a 4¼ foot object height in the center of the approaching lane of the major road.

Based on the criteria set forth in Table 405.1A of the Caltrans HDM and a posted speed limit of 45 mph on W. 190th Street, a corner sight distance of 496 feet is required for left-turn at Project Driveway 1, 430 feet for right-turn at Project Driveway 1, and 695 feet for right-turn at Project Driveway 2.

Based on the criteria set forth in Table 405.1A of the Caltrans HDM and a prima facie limit of 25 mph on Crenshaw Place, a corner sight distance of 386 feet is required for right-turn at Project Driveway 3, 276 feet is required for left-turn at Project Driveway 4, and 239 feet for right-turn at Project Driveway 1.

Figures 9-3, 9-4 and ***9-5*** presents the results of the sight distance evaluation for the Project driveways based on the application of the corner sight distance criteria. The figures illustrate the limited use areas. As shown, the sight lines at the proposed Project driveways are expected to be adequate as long as obstructions within the sight triangles are minimized.





Smeal Platform RM 100ft

	feet
Width	: 8.33
Track	: 7.83
Lock to Lock Time	: 6.0
Steering Angle	: 48.0

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LINSCOTT LAW & GREENSPAN engineers

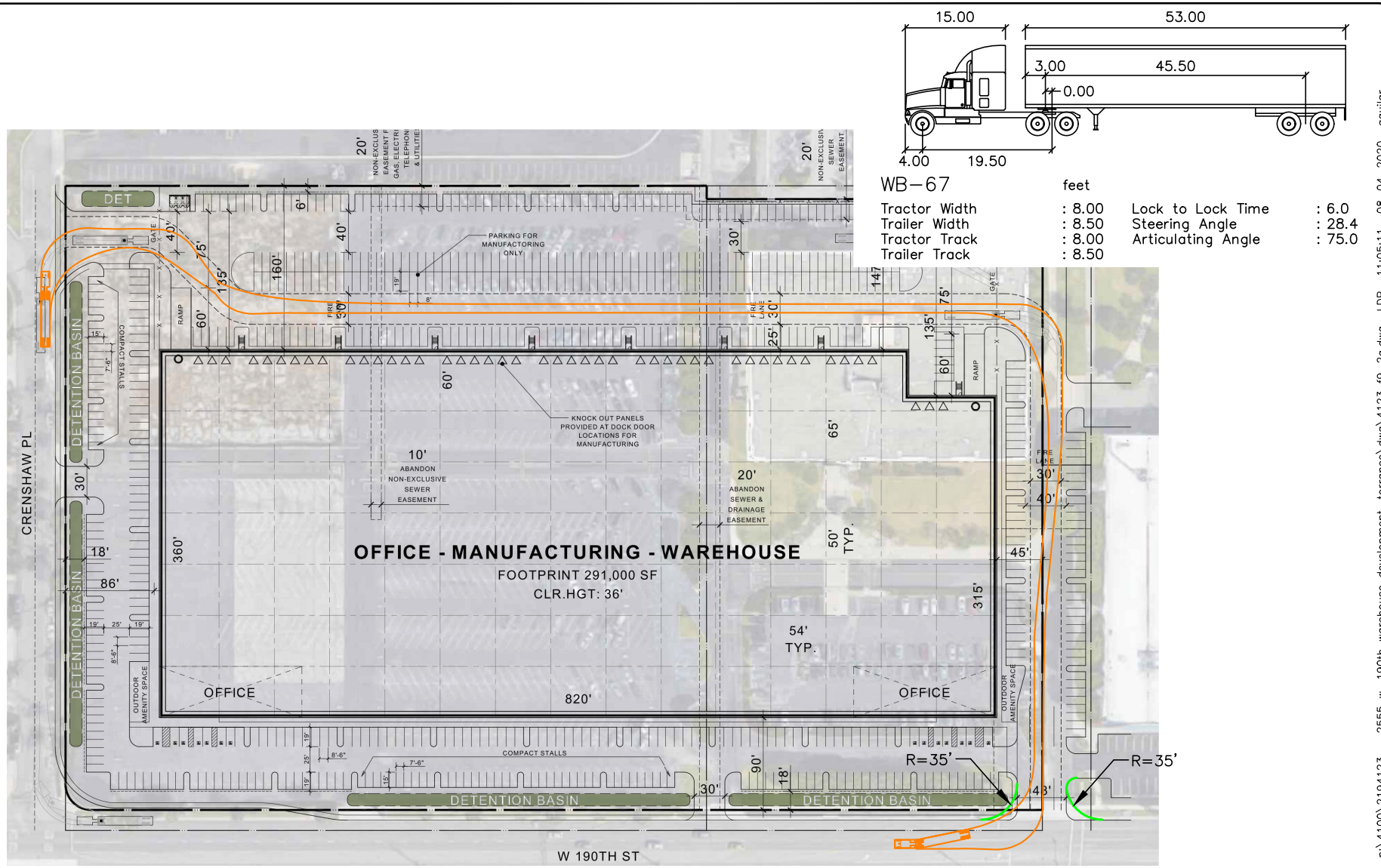
N NO SCALE

SOURCE: WARE MALCOMB

FIGURE 9-1

FIRE TRUCK TURNING ANALYSIS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE



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LINSCOTT LAW & GREENSPAN engineers

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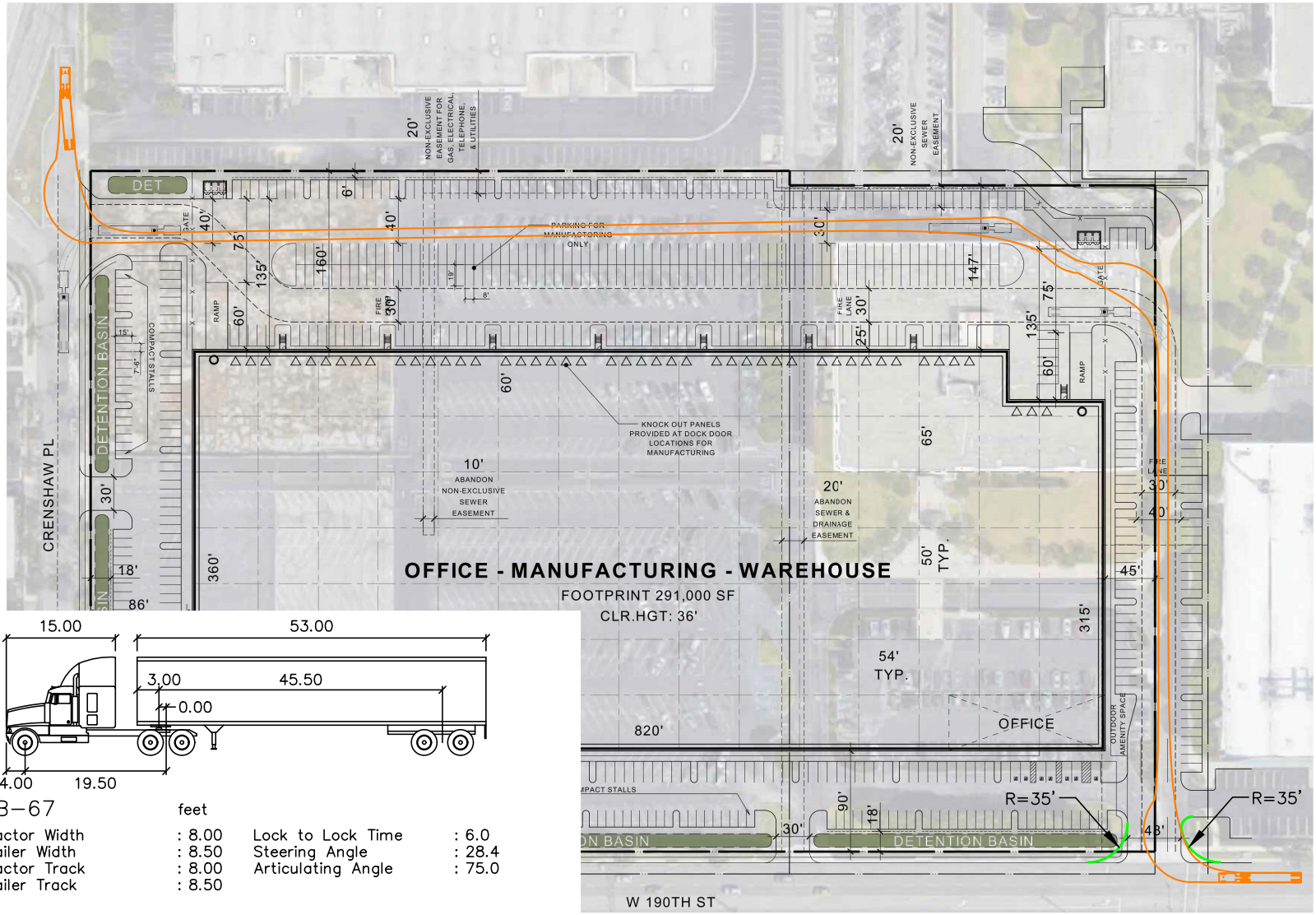
SOURCE: WARE MALCOMB

FIGURE 9-2A

WB-67 TRUCK TURNING ANALYSIS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE



WB–67 feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: WARE MALCOMB

FIGURE 9–2B

WB–67 TRUCK TURNING ANALYSIS

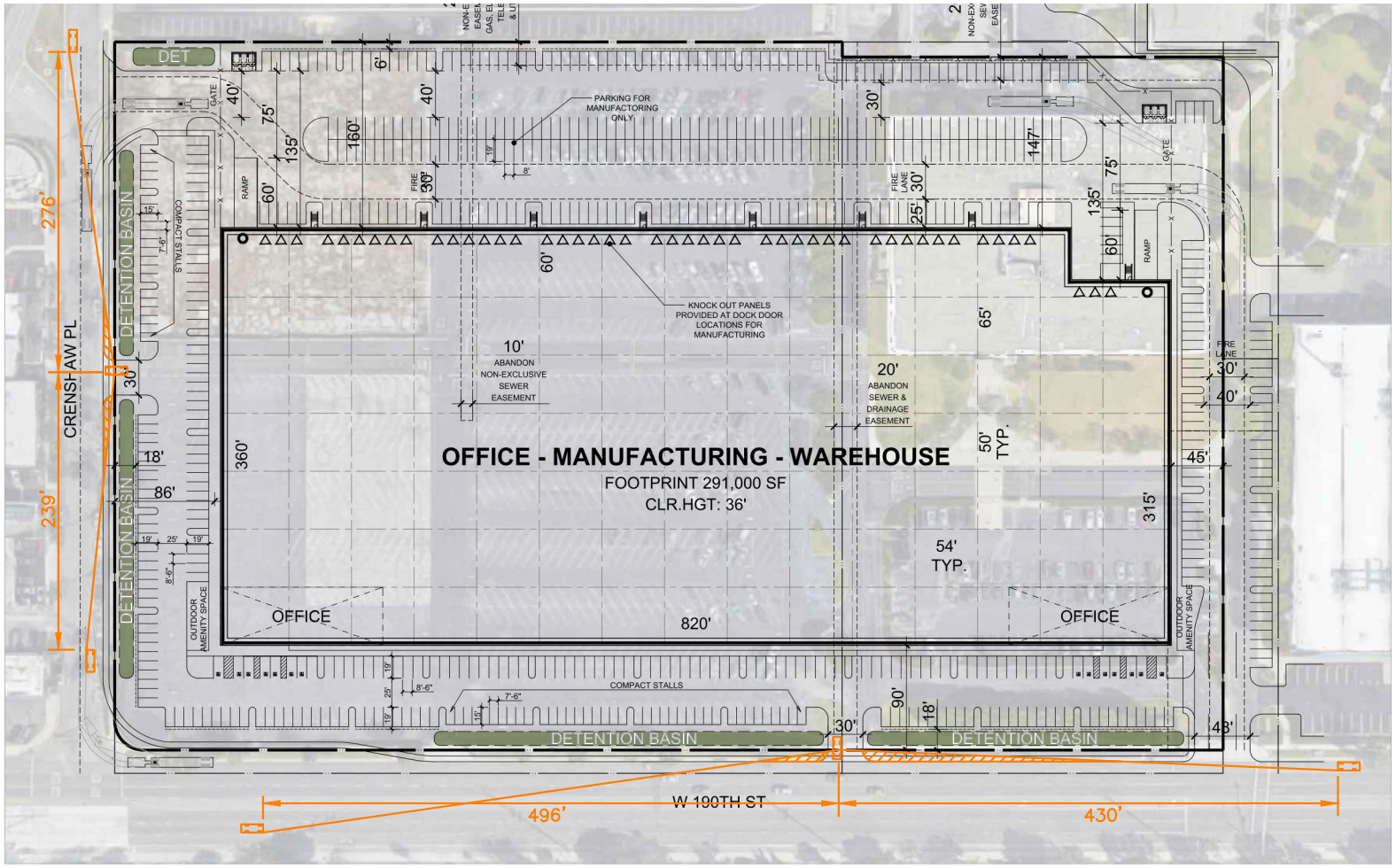
2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

CORNER SIGHT DISTANCE (PASSENGER CARS)

DESIGN SPEED LIMIT:	25 MPH		45 MPH	
REQUIRED STOPPING SIGHT DISTANCE:	LEFT–TURN	RIGHT–TURN	LEFT–TURN	RIGHT–TURN
	276 FEET	239 FEET	496 FEET	430 FEET

LEGEND

PUBLIC RIGHT–OF–WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



SOURCE: WARE MALCOMB

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 9–3

DRIVEWAY 1 AND 4 SIGHT DISTANCE ANALYSIS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

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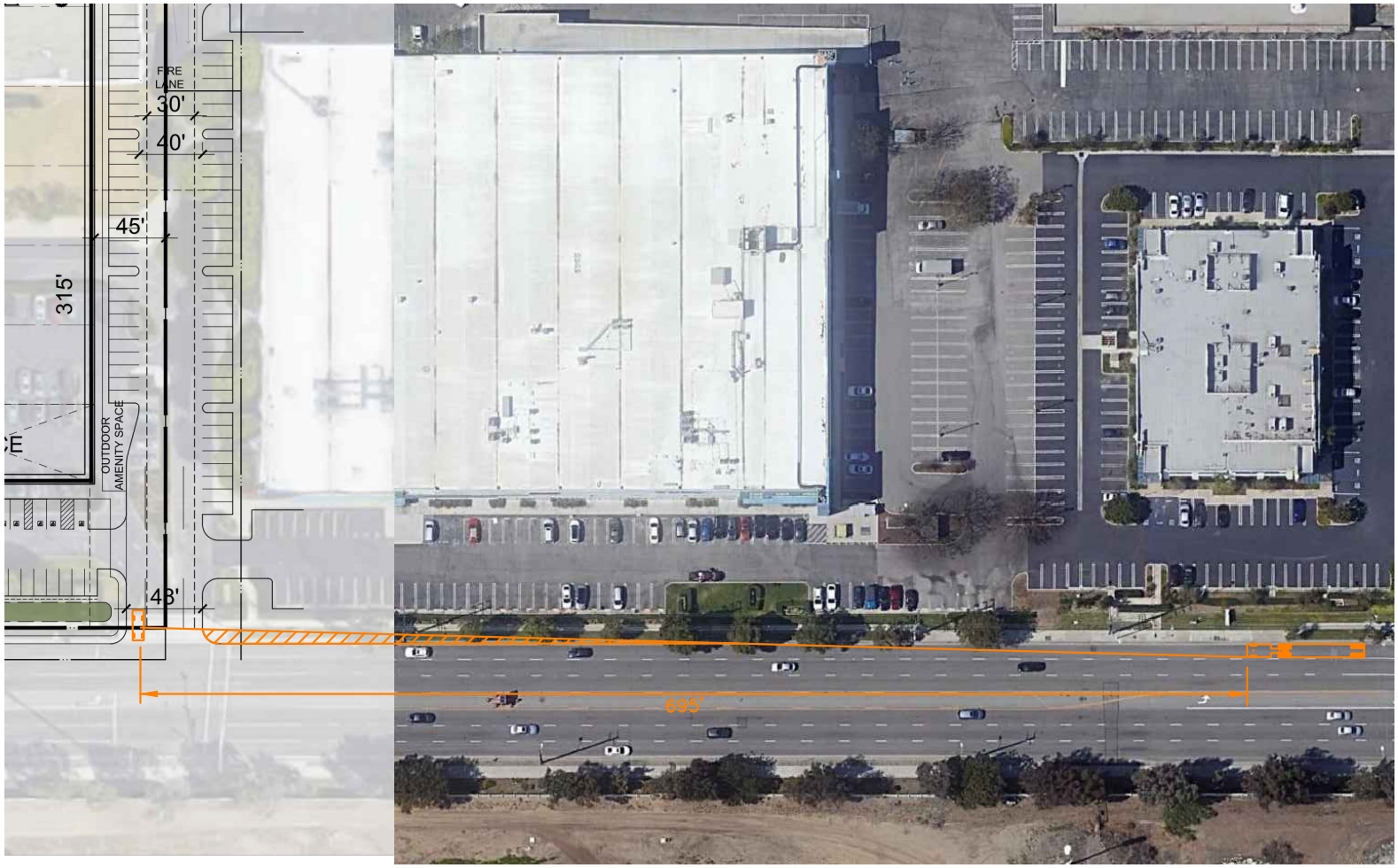
CORNER SIGHT DISTANCE (TRUCKS)

DESIGN SPEED LIMIT:	45 MPH
REQUIRED STOPPING SIGHT DISTANCE:	695 FEET

LEGEND

PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: WARE MALCOMB

FIGURE 9-4

DRIVEWAY 2 SIGHT DISTANCE ANALYSIS

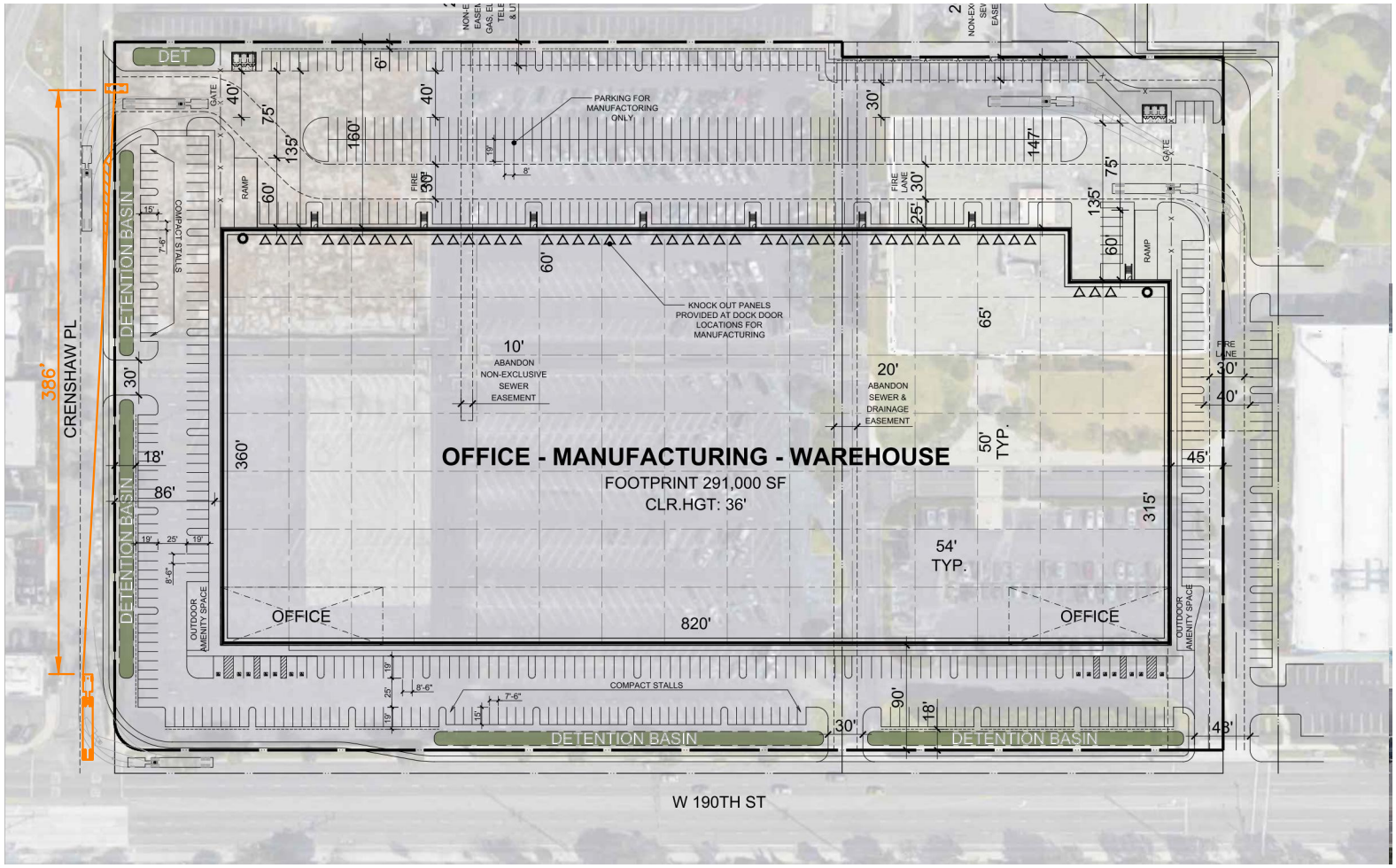
2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

CORNER SIGHT DISTANCE (TRUCKS)

DESIGN SPEED LIMIT:	25 MPH
REQUIRED STOPPING SIGHT DISTANCE:	386 FEET

LEGEND

PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: WARE MALCOMB

FIGURE 9-5

DRIVEWAY 3 SIGHT DISTANCE ANALYSIS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

TABLE 9-1

PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection		Time Period	Control Type	(1) Existing With Ambient Growth (Year 2022) With Project With Cumulative Projects	
				ICU/HCM	LOS
8.	Project Driveway 1 at W. 190th Street	AM	One-Way Stop	20.3 s/v	C
		PM		24.8 s/v	C
9.	Project Driveway 2 at W. 190th Street	AM	3∅ Traffic Signal	0.554	A
		PM		0.561	A
A.	Crenshaw Place at Project Driveway 3	AM	One-Way Stop	8.9 s/v	A
		PM		9.1 s/v	A
B.	Crenshaw Place at Project Driveway 4	AM	One-Way Stop	9.2 s/v	A
		PM		9.2 s/v	A

Notes:

- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Tables 3-1* and *3-2* for the LOS definitions
- **Bold ICU/HCM/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report

10.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where projected traffic volumes are expected to result in significant impacts, this report recommends traffic improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure roadways to specific approaches of a key intersection. The identified improvements are expected to:

- Address the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative projects) traffic, and
- Improve Levels of Service as to mitigate the impact.

10.1 Project-Specific Improvements

The following improvements are being implemented as part of the proposed Project, which the Project is expected to pay the full construction costs:

- **Intersection 7 – Crenshaw Place at W. 190th Street:** Widen to provide additional right-of-way to construct an exclusive westbound right-turn lane. This improvement, which has been incorporated in the Project site plan as a Project "design feature" is subject to the review and approval of the City of Torrance.

10.2 Planned and Recommended Improvements

10.2.1 *Existing With Ambient Growth (Year 2022) With Project Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 7-1* indicates that the proposed Project significantly impacts five (5) study intersections under Existing with Ambient Growth with Project traffic conditions. The planned and/or recommended improvements are as follows:

- **Intersection 1 – Crenshaw Boulevard at W. 182nd Street:** Planned improvements at the intersection include restriping the existing northbound right-turn lane into a shared through/right-turn lane, constructing an exclusive eastbound right-turn lane and westbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary and remove the existing northbound right-turn overlap. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 2 – I-405 NB Ramps at W. 182nd Street:** Planned improvements at the intersection include restriping the existing northbound shared left/right-turn lane into an exclusive left-turn lane, constructing an exclusive northbound right-turn lane, and constructing an exclusive eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with

the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 3 – Crenshaw Boulevard at I-405 SB Ramps:** Planned improvements at the intersection include the construction of a new two-lane I-405 SB on-ramp from northbound Crenshaw Boulevard. As a result, additional improvements include the removal of the exclusive northbound left-turn lane, the construction of an exclusive northbound right-turn lane, the construction of an exclusive southbound right-turn lane, restriping the existing eastbound shared left/right-turn lane to an exclusive left-turn lane, and the construction of a second eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 10 – Van Ness Avenue at W. 190th Street:** Restripe the westbound approach to include an additional through lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance.

- **Intersection 11 – I-405 Southbound Ramps at W. 190th Street:** Construct an additional southbound left-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

10.2.2 *Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 7-1* indicates that the eight (8) study intersections will be cumulatively impacted under Existing with Ambient Growth with Project with Cumulative traffic conditions. To off-set cumulative traffic impacts, the planned and/or recommended improvements are as follows:

- **Intersection 1 – Crenshaw Boulevard at W. 182nd Street:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include restriping the existing northbound right-turn lane into a shared through/right-turn lane, constructing an exclusive eastbound right-turn lane and westbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary and remove the existing northbound right-turn overlap. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report*.

- **Intersection 2 – I-405 NB Ramps at W. 182nd Street:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include restriping the existing

northbound shared left/right-turn lane into an exclusive left-turn lane, constructing an exclusive northbound right-turn lane, and constructing an exclusive eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report.*

- **Intersection 3 – Crenshaw Boulevard at I-405 SB Ramps:** *Same as those identified in Section 10.2.1.* Planned improvements at the intersection include the construction of a new two-lane I-405 SB on-ramp from northbound Crenshaw Boulevard. As a result, additional improvements include the removal of the exclusive northbound left-turn lane, the construction of an exclusive northbound right-turn lane, the construction of an exclusive southbound right-turn lane, restriping the existing eastbound shared left/right-turn lane to an exclusive left-turn lane, and the construction of a second eastbound right-turn lane. Additional right-of-way will be required to construct these improvements. Modify the existing traffic signal as necessary. These planned improvements, which have been approved and funded, are consistent with the improvements identified in the *I-405 at Crenshaw Boulevard/182nd Street Interchange Improvement Project Final Initial Study/Environmental Assessment Report.*

- **Intersection 4 – Western Avenue at I-405 NB Ramps:** Restripe the existing westbound shared through/right-turn lane into an exclusive left-turn lane. Construct an exclusive westbound right-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

- **Intersection 6 – Crenshaw Boulevard at W. 190th Street:** No physical mitigation measures are feasible for the near term; any additional lanes will require widening and additional right-of-way. As such, the cumulative impact at this location is unavoidable and will remain unmitigated.

- **Intersection 10 – Van Ness Avenue at W. 190th Street:** *Same as those identified in Section 10.2.1.* Restripe the westbound approach to include an additional through lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance.

- **Intersection 11 – I-405 Southbound Ramps at W. 190th Street:** *Same as those identified in Section 10.2.1.* Construct an additional southbound left-turn lane. Additional right-of-way will be required to construct the additional turn lane. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans.

- **Intersection 12 – Western Avenue at W. 190th Street:** No physical mitigation measures are feasible; any additional lanes will require widening, signal modification, utility relocation and/or additional right-of-way acquisition. As such, the cumulative impact at the intersection of Western Avenue at W. 190th Street is unavoidable and will remain unmitigated.

  Should additional right-of-way be obtained and existing surrounding utilities be relocated, construct a second southbound right-turn lane and an exclusive westbound right-turn lane. Additional right-of-way will be required to construct the additional turn lanes. Modify the existing traffic signal as necessary. These improvements are subject to the approval of the City of Torrance and Caltrans. Although the proposed improvements are considered to be not feasible the City may still require fair share payment towards potential future improvements at this location.

10.3 Caltrans Recommended Improvements

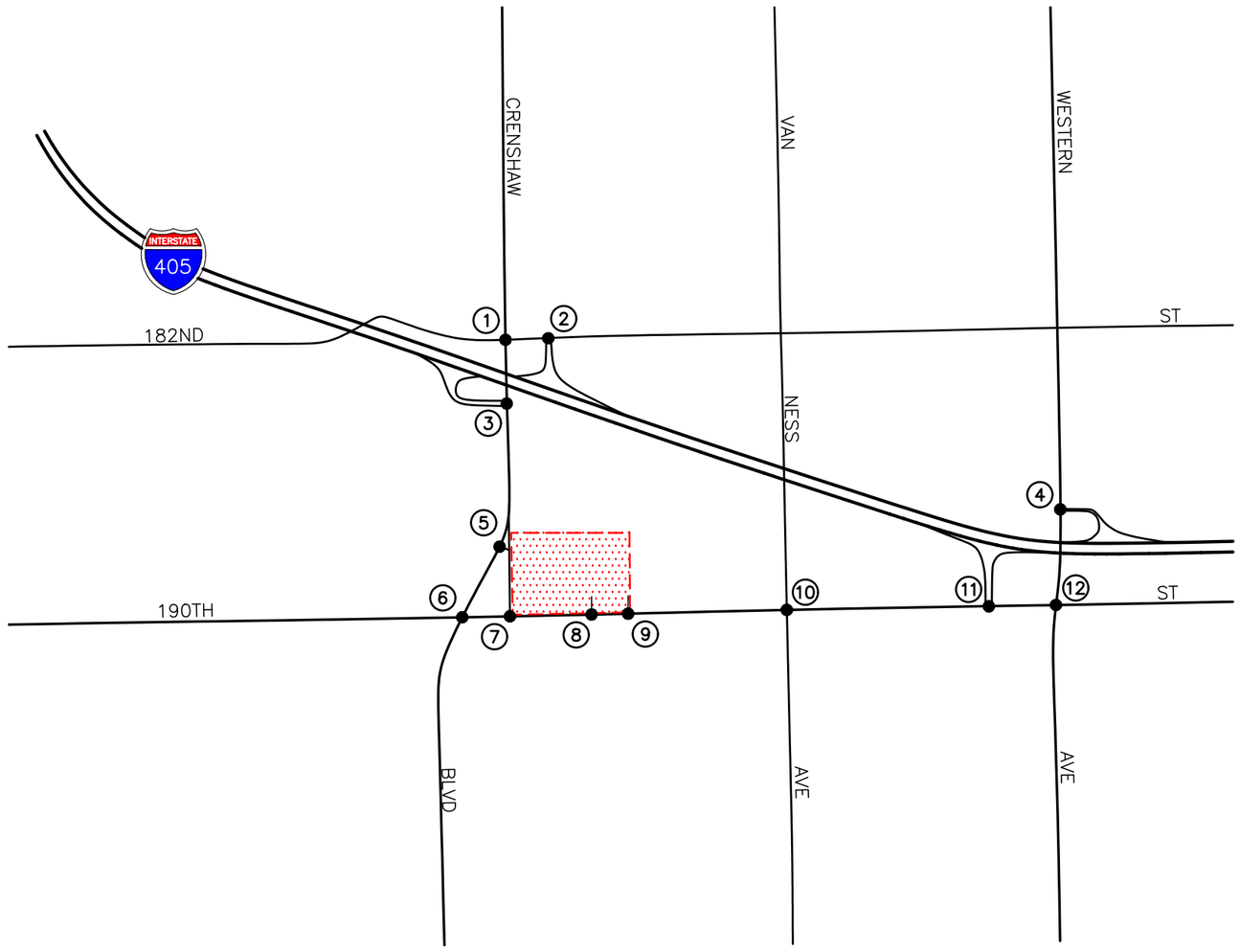
10.3.1 *Existing With Ambient Growth (Year 2022) With Project Traffic Conditions*

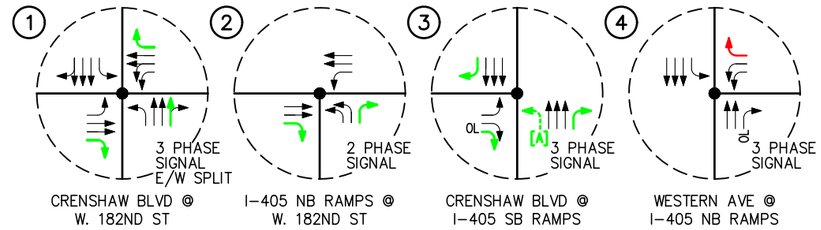
The results of the intersection capacity analyses summarized in *Table 8-2* indicates that the proposed Project will not significantly impact any of the four (4) state-controlled study intersections under Existing With Ambient Growth (Year 2022) With Project traffic conditions. Given there are no significant project impacts, no improvements are required under this traffic scenario.

10.3.2 *Existing With Ambient Growth (Year 2022) With Project With Cumulative Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-2* indicates that the proposed Project will not significantly impact any of the four (4) state-controlled study intersections under Existing With Ambient Growth (Year 2022) With Project With Cumulative Projects traffic conditions. Given there are no significant project impacts, no improvements are required under this traffic scenario.

Figure 10-1 presents the planned and recommended improvements for the key study intersections.





NOTES:

[A] IMPROVEMENTS IDENTIFIED ARE CONSIDERED NOT FEASIBLE.

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KEY

(#) = STUDY INTERSECTION
= APPROACH LANE ASSIGNMENT
= PROJECT SPECIFIC IMPROVEMENT
= RECOMMENDED IMPROVEMENT
= PLANNED IMPROVEMENT
● = TRAFFIC SIGNAL, ☛ = STOP SIGN
* = NO LEFT-TURN BETWEEN 4:00PM TO 6:00PM
OL = OVERLAP
[A] = REMOVE LANE
= PROJECT SITE

FIGURE 10-1

PLANNED AND RECOMMENDED IMPROVEMENTS

2555 W. 190TH STREET WAREHOUSE/MANUFACTURING PROJECT, TORRANCE

10.4 Project-Related Fair share Contribution

The transportation impacts associated with the development of the Project were determined based on the Existing with Project, Existing with Ambient Growth with Project, and Existing with Ambient Growth with Project with Cumulative Projects.

The project is anticipated to significantly impact five (5) study intersections under Existing with Ambient Growth (Year 2022) with Project traffic conditions and cumulatively impact eight (8) study intersections under Existing with Ambient Growth (Year 2022) with Project with Cumulative traffic conditions. The improvements identified would offset the impact of the Project and cumulative traffic. Subject to the City's requirements, the proposed Project can be expected to pay a fair-share of the construction costs to implement the mitigation measures, or construct the improvements.

10.4.1 *Year 2022 Project-Related Fair Share Contribution*

Table 10-1 presents the peak hour percentage of net traffic impact at the study intersections cumulatively impacted by the proposed Project for Year 2022 traffic conditions. As presented in this table, the first column (1) presents a total of all intersection project traffic volumes. The second column (2) presents a total of all intersection related project traffic volumes. The third column (3) represents what percentage of new traffic is project-related and the fourth column (4) represents the average project percentage share.

Review of *Table 10-1* shows that the proposed Project's percentage of net traffic impact ranges between **27.1%** and **33.9%**. These percentages represent the Project's "fair-share" cost responsibility associated with the implementation of the recommended mitigation measures.

Please note that fair-share percentage for Crenshaw Boulevard/W. 182nd Street, I-405 Northbound Ramps/W. 182nd Street and Crenshaw Boulevard at I-405 Southbound Ramps are planned and funded improvements, therefore the project is not expected to contribute to the costs. It should also be noted that a fair-share percentage has not been identified for the intersection of Crenshaw Boulevard/W. 190th Street, since no physical mitigation measures are feasible at this location.

TABLE 10-1
YEAR 2022 PROJECT FAIR SHARE CONTRIBUTION

	Key Intersections	Impacted Time Period	(1) Project Only Traffic	(2) Related Projects Only Traffic	(3) Project Percentage Share	(4) Average Project Percentage Share
1.	Crenshaw Boulevard at W. 182nd Street	AM PM	*Planned and funded improvement*			
2.	I-405 Northbound Ramps at W. 182nd Street	AM PM	*Planned and funded improvement*			
3.	Crenshaw Boulevard at I-405 Southbound Ramps	AM PM	*Planned and funded improvement*			
4.	Western Avenue at I-405 Northbound Ramps	AM PM	59 30	115 84	**33.9%** 26.3%	**33.9%**
6.	Crenshaw Boulevard at W. 190th Street	AM PM	*Not Feasible*			
10.	Van Ness Avenue at W. 190th Street	AM PM	117 100	314 277	**27.1%** 26.5%	**27.1%**
11.	I-405 Southbound Ramps at W. 190th Street	AM PM	103 86	240 220	**30.0%** 28.1%	**30.0%**
12.	Western Avenue at W. 190th Street	AM PM	91 66	180 144	**33.6%** 31.4%	**33.6%**

Notes:
Net Project Percent Increase (3) = [Column (1)] / [Column (1) + Column (2)]

10.5 City of Torrance Development Impact Fee (DIF) Program

On October 31, 2005, the Torrance City Council approved and adopted a Development Impact Fee (DIF) Program. Pursuant to the requirements of the City of Torrance, Development Impact Fees will be required of the Project. The DIF is applied to pay a portion of the costs identified for public facilities, including transportation-related improvements, as well as underground of utilities, sewer, and storm drain improvements, and Police and Fire facilities. The Development Impact Fee is based on the size of all new developments and is a one-time cost other than a tax or special assessment according information published by the City of Torrance Community Development Department.

Review of ***Table 10-2*** indicates that effective July 7, 2018, the City's DIF rate for industrial uses ranges from a low of $1,347.83 per 1,000 SF for Industrial/Light uses to a high of $1,954.31 per 1,000 SF for Industrial/Business Park. For Commercial Center and Commercial / General land uses, the City's DIF rate totals $1,891.20 per 1,000 SF and $5,799.34 per 1,000 SF, respectively. For Multi-Family/Others, the City's DIF is $2,427.13 per unit; Single-Family Detached is exempt.

Assuming the proposed Project falls under the "Industrial/Light" category, the Project can be expected to pay a total of $411,829.00 (305.550 KSF x $1,347.83) in Development Impact Fees. Although the existing office building is currently vacant, it is presumed that the prior development has paid it's appropriates fees when it was initially constructed, inclusive of participating in the City's DIF program (to be confirmed by the Project Applicant and City staff). Therefore, a potential credit of up to $927,894.40 (160.000 KSF x $5,799.34) could be applied assuming general office falls under the Commercial / General category. Pending review and confirmation by City staff, the Project shouldn't be required to pay into the DIF program since the DIF related to the existing office building exceeds the DIF of the current Project. The category and precise fee will be determined upon issuance of project building permits by the City of Torrance.

TABLE 10-2

CITY OF TORRANCE DEVELOPMENT IMPACT FEE RATES

Type of Development	City Fee / Rate ($ per 1000 SF)[18]
▪ Single Family Detached (per unit)	Exempt
▪ Multi-family / Others (per unit)	$2,427.13
▪ Commercial / General	$5,799.34
▪ Commercial Center	$1,891.20
▪ Industrial / Light	$1,347.83
▪ Industrial / Heavy	$1,528.91
▪ Industrial / Business Park	$1,954.31

[18] Source: City of Torrance, effective July 7, 2018

11.0 CONGESTION MANAGEMENT PROGRAM (CMP) ASSESSMENT

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system.

11.1 Traffic Impact Review

As required by the current *Congestion Management Program for Los Angeles County*, a review has been made of designated monitoring locations on the CMP highway system for potential impact analysis. Per CMP TIA criteria, the geographic area examined in the TIA must include the following, at a minimum:

- All CMP arterial monitoring intersections, including freeway on and off-ramp intersections, where the project will add 50 or more trips during either the AM or PM weekday peak hours.

- Mainline freeway-monitoring stations where the project will add 150 or more trips, in either direction, during the AM or PM weekday peak hours.

11.1.1 *Freeways*

The following CMP freeway monitoring station in the Project vicinity has been identified:

CMP Station	Location
1068	I-405 Freeway north of Inglewood Avenue, at Compton Boulevard

The closest CMP freeway monitoring location in the Project vicinity is the I-405 Freeway n/o Inglewood Avenue, at Compton Boulevard (CMP Station 1068 – Post Mile 18.63). Based on the Project's trip generation potential and distribution pattern, the proposed Project will not add more than 150 trips (in either direction) during either the weekday AM or PM peak hour at this CMP mainline freeway-monitoring location. Therefore, a CMP freeway traffic impact analysis is not required.

11.1.2 *Intersections*

The following CMP intersection monitoring locations in the Project vicinity has been identified:

CMP Intersection	Location
154	Western Avenue at W. 190th Street

As stated earlier, the CMP guidelines require that arterial monitoring intersection locations must be examined if the proposed Project will add 50 or more trips during either the AM or PM weekday peak hours (of adjacent street traffic) at CMP monitoring intersections.

Based on the proposed project's trip generation potential, trip distribution and trip assignment, the proposed Project is expected to add 91 project trips in the AM peak hour and 66 trips in the PM peak

hour at CMP intersection 154. Review of *Table 7-1* shows that the intersection of Western Avenue at 190th Street is considered cumulatively impacted under Existing With Ambient Growth (Year 2022) With Project With Cumulative Projects traffic conditions. However, with the implementation of recommended improvements the cumulative impact will be offset.

11.2 Transit Impact Review

As required by the Congestion Management Program for Los Angeles County, a review has been made of the CMP transit service. As previously discussed, a number of transit services exist in the Project area, necessitating the following transit impact review.

The Project trip generation, as shown in *Table 5-2*, was adjusted by values set forth in the CMP (i.e., person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of the total person trips) to estimate Project-related transit trip generation. Pursuant to the CMP guidelines, the proposed Project is forecasted to generate 11 net transit trips (9 inbound and 2 outbound) during the AM peak hour and 12 net transit trips (4 inbound and 8 outbound) during the PM peak hour. Over a 24-hour period the proposed Project is forecasted to generate 69 net daily weekday transit trips.

It is anticipated that the existing transit service in the Project area would be able to accommodate the Project generated transit trips. Therefore, given the number of transit trips generated by the Project and the existing transit routes in the Project vicinity, it is concluded that the public transit system would not be significantly impacted by the proposed Project.