

California Environmental Quality Act

**NOTICE OF INTENT TO ADOPT
A MITIGATED NEGATIVE DECLARATION**

City of Lawndale
Community Development Department
Planning Division
14717 Burin Avenue
Lawndale, CA 90260
(310) 973-3200 Tel.
(310) 970-2183 Fax



To: All Interested Persons and Agencies
From: City of Lawndale
Date: September 24, 2015
Project Title: Grevillea Gardens 26-Unit Condominium Development

Notice is hereby given that the City of Lawndale as lead agency for compliance with the California Environmental Quality Act (CEQA), intends to adopt a Mitigated Negative Declaration (MND) for the Grevillea Gardens 26-Unit Condominium Development, pursuant to the California Code of Regulations, Title 14, Section 15070.

Project Location: The project site is located at 4430-4440 W. 153rd Street, west of Hawthorne Boulevard, in the City of Lawndale. The project site is in an area with a mix of residential, commercial, and semi-industrial uses.

Project Description: The proposed project entails the construction of a 26-unit residential condominium complex on a 0.96-acre site, consisting of a three-story structure with tuck-under parking at grade level. The project site consists of three parcels (APN 4079-016-021, 4079-016-026, and 4079-016-027). The site is vacant with the exception of one single-family dwelling at 4440 W. 153rd St. As proposed, the project would consist of one structure, three stories in height (35' max.) with one level of tuck-under parking, and would include 26 residential condominium units. The condominium units would range from 1,550 square feet for 2-bedroom units to 2,081 square feet for 3-bedroom units.

Findings/Determination: The City has reviewed and considered the proposed project and has determined that the project will not have a significant effect on the environment after implementation of mitigation measures, with substantial supporting evidence provided in the Initial Study. The City hereby prepares and proposes to adopt a Mitigated Negative Declaration for this project.

Public Review Period and Written Comments: In compliance with the CEQA regulations Section 15105(b), the public review period for the proposed Mitigated Negative Declaration begins on September 24, 2015 and ends on October 13, 2015 at 5:00 p.m. When submitting a comment, please include the name of a contact person in your agency or organization. Comments regarding the scope of the environmental analysis to be conducted for the proposed project may be submitted by mail, e-mail, or fax to the address below:

Perry Banner
Community Development Manager
Community Development Department

City of Lawndale
14717 Burin Avenue
Lawndale, CA 90260
Fax: (310) 970-2183
Email: pbanner@lawndalecity.org

Public Hearing: The Planning Commission of the City of Lawndale is tentatively scheduled to conduct a public hearing to consider the proposed project during the Commission's regularly scheduled meeting of October 15, 2015 at 6:30 p.m. in the Lawndale City Hall Council Chambers, 14717 Burin Avenue, Lawndale, CA 90260.

Document Availability: The Mitigated Negative Declaration is available for review at the Community Development Department offices, City of Lawndale, located at the address above.

Introduction: This Initial Study has been prepared to comply with the requirements of the California Public Resources Code, Section 21000, et seq., and the California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations, Section 15000, et seq.). This Initial Study considers the environmental effects associated with the proposed Grevillea Gardens 26-unit condominium complex (the “Project”). Figure 2 indicates the location of the Project within the City of Lawndale.

Project Title and File No: Case No. 14-11: Special Use Permit, Design Review, Vesting Tentative Tract Map No. 73159

Related File No(s): None

Submittal Date: September 24, 2015

Lead Agency: **City of Lawndale**
14717 Burin Avenue
Lawndale, CA 90260

Project Contact: Perry A. Banner, Community Development Manager
(310) 973-3206

Project Sponsor: Ali Awad
221 Avenue B
Redondo Beach, CA 90277

Project Location: The City of Lawndale is located in the Los Angeles metropolitan South Bay Area, approximately 3 miles east of the Pacific Ocean. The City is located south of the 105 Freeway with the 405 Freeway bisecting the community.

The project site is located at 4430-4440 W. 153rd Street between Hawthorne Boulevard and Grevillea Avenue. The area around the project site is a combination of residential, commercial, and light industrial uses. **Figure 1** illustrates the location of the project site in its regional context and **Figures 2 and 3** illustrate the immediate project vicinity.

Project Description: The proposed project entails the construction of a 26-unit residential condominium complex on a 0.96-acre site, consisting of a three-story structure with tuck-under parking at grade level.

The project site consists of three parcels (APN 4079-016-021, 4079-016-026, and 4079-016-027). The site is vacant with the exception of one single-family dwelling at 4440 W. 153rd St.

As proposed, the project would consist of one structure, three stories in height (35' max.) with one level of tuck-under parking, and would include 26 residential condominium units.

**General Plan
Designation:**

Multi-Family Medium Density

Zoning Designation: Limited Multiple Residence (R-3)

**Surrounding
Land Uses:**

Varies from residential to commercial to light manufacturing.

Site Size: 41,783 sq. ft. (0.96 acres)

Assessor's Parcel No: 4079-016-021, 4079-016-026, and 4079-016-027

Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):

City of Lawndale – Planning Commission

Figure 1 – REGIONAL LOCATION MAP

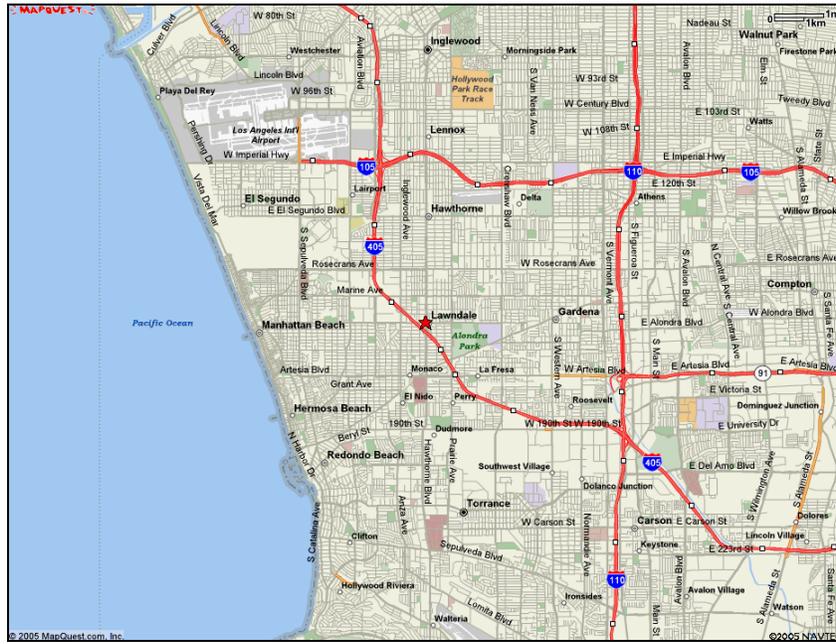
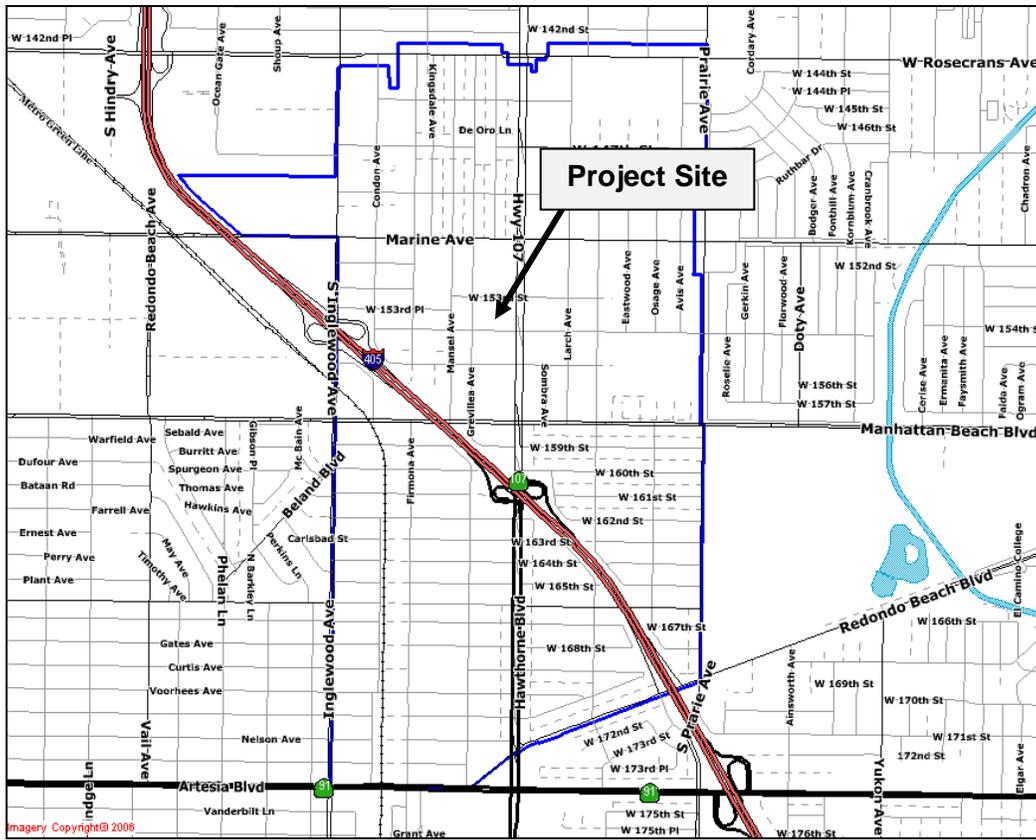
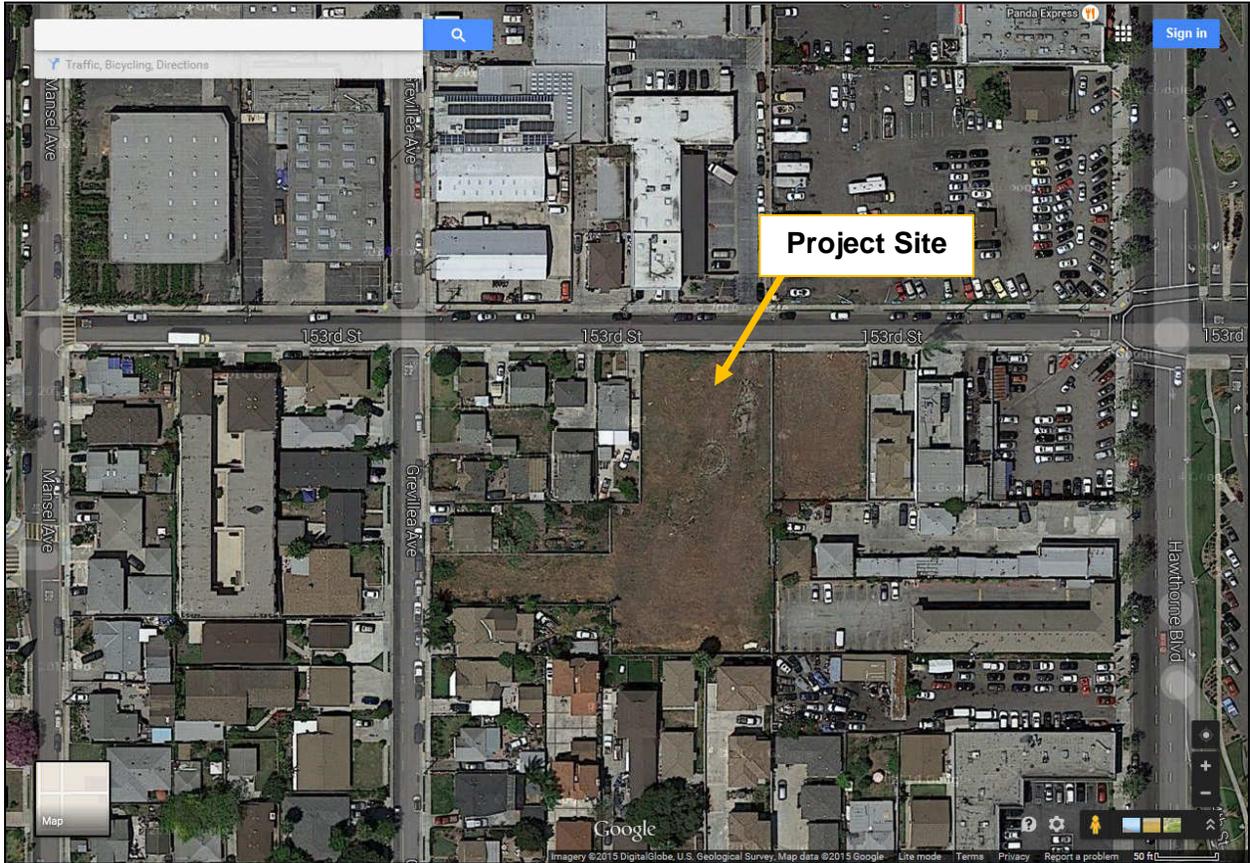


Figure 2 – VICINITY MAP



Draft Initial Study/Negative Declaration
 Case No. 14-11: Special Use Permit, Design Review, Vesting Tentative Tract Map No. 73159

Figure 3 – AERIAL PHOTO OF SITE



ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages.

- | | | |
|--|--|--|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Agriculture Resources | <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Air Quality | <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Utilities/Service Systems |
| <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Mandatory Findings |
| <input type="checkbox"/> Geology/Soils | <input type="checkbox"/> Population/Housing | |

DETERMINATION:

On the basis of this initial evaluation:

- I find that the proposed project **COULD NOT** have a significant impact on the environment, and a **NEGATIVE DECLARATION** will be prepared.
- I find that although the proposed project could have a significant impact on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.
- I find that the proposed project **MAY** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.
- I find that the proposed project **MAY** have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on an earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects 1) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and 2) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Prepared by: Perry A. Banner Department Representative: Comm. Development Mgr.

Reviewed by: Perry A. Banner Date: September 24, 2015

ENVIRONMENTAL CHECKLIST:

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

Comments:

- a) **No Impact.** The proposed project includes redevelopment in an urbanized area in the City of Lawndale. The project site is not part of a scenic vista, nor is it close enough to a scenic vista (i.e., ocean or mountain view) that the proposed project would obstruct views. Any potential views through the site to the Santa Monica Mountains, located approximately 14 miles north and northwest of the site, the ocean, located approximately 3.5 miles west of the project site, or other scenic resources, are unavailable due to relatively flat topography and the presence of existing buildings. Therefore, no impact would occur.

- b) **No Impact.** The proposed project is not located adjacent to or within view of a State Scenic Highway. No trees, rock outcroppings, historic buildings, or other scenic resources are located on the project site. Therefore, no impact would occur.

- c) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project would substantially degrade the existing visual character or quality of the project site and its surroundings. While the proposed building would be one to two stories taller than the existing surrounding uses, it would not degrade the existing visual character or quality of its surroundings. Furthermore, the site is currently vacant with no redeeming aesthetic or architectural qualities. The proposed three-story condominium project would be expected to improve the architectural character of the site through good design and architectural features. It would be designed in an architectural style typical in Southern California, and would not create a visual contrast through unique or unusual elements. The proposed project would comply with the development standards in the R-3 (Limited Multiple Residence) Zone and is consistent with the General Plan. Therefore, the proposed project would not substantially degrade the visual character of the project site and/or its surroundings. Impacts will be less than significant.

- d) **Less-Than-Significant Impact.** A significant impact would occur if light and glare substantially altered the character of off-site areas surrounding the site or interfered with the performance of an off-site activity. Light impacts are typically associated with the use of artificial light during the evening and nighttime hours. For security purposes, the proposed building would incorporate lighting into open space areas and at pedestrian and automobile access locations. Light would be shed from windows, and parking ingress and egress points would also be lighted. Because the proposed project would result in increased density and massing on the project site, ambient lighting levels in the project area may increase. However, the proposed project would comply with Lawndale Municipal Code Section 17.56.150(B)(3) in that glare shall be shielded or directed in such a manner that the glare is not perceptible at or beyond any property line. In addition, based on the scale of the project, a

comprehensive light plan will be required to be approved by the Community Development Director. Therefore, with compliance of existing Lawndale regulations impacts will be less than significant.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **No Impact.** The proposed project consists of the redevelopment of an existing primarily vacant site to a multi-family condominium complex. No portion of the project site is currently in use for agricultural purposes. The proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural uses. Therefore, no impact would occur.
- b) **No Impact.** A significant impact would occur if the proposed project conflicted with existing agricultural zoning or agricultural parcels enrolled under the Williamson Act. The project site is not zoned for agricultural purposes; it is zoned as Limited Multiple Residence (R-3). No agricultural zoning is present in the surrounding area, and no nearby lands are enrolled under the Williamson Act. Therefore, no impact would occur.
- c) **No Impact.** The project site is zoned Limited Multiple Residence (R-3), and no land within the City is zoned for forest land or timberland. Therefore, no impact would occur.
- d) **No Impact.** The project site does not consist of any forest land and no forest land is present within the City of Lawndale. Therefore, no impact would occur.

- e) **No Impact.** As discussed above, the project site is located in an urbanized area of the City of Lawndale and is currently vacant with the exception of one single-family residence. It has been operating in this manner for decades. The proposed project would not result in changes to the existing environment that would convert any farmland to non-agricultural uses. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

Comments:

- a) **Less-Than-Significant Impact.** The applicable air quality plan for the project site is the 2012 South Coast Air Quality Management Plan (AQMP), developed by the Southern California Air Quality Management District (SCAQMD) and the Southern California Association of Governments (SCAG). A project is considered consistent with the AQMP if (1) the proposed project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP, and (2) the proposed project would not exceed the assumptions in the AQMP based on the year of project buildout phase (2017). The proposed project is consistent with the SCAG population growth forecasts. Because the growth assumed in the AQMP is based on SCAG growth forecasts, the proposed project is consistent with the AQMP. Impacts would be less than significant.
- b) **Less-Than-Significant Impact.** Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips generated from construction workers traveling to and from the project site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions. Fugitive dust emissions would primarily result from demolition and site preparation activities (e.g., grading), and carbon monoxide (CO), nitrogen oxide (NO_x), and sulfur oxide (SO_x) emissions would primarily

result from the use of construction equipment. During the finishing phase, paving operations would release volatile organic compounds (VOC).

It is mandatory for all construction projects in the South Coast Air Basin to comply with SCAQMD Rule 403 for fugitive dust. Specific Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas. Compliance with Rule 403 would reduce particulate matter emissions associated with construction activities.

With regard to operational emissions, the proposed project would increase average daily traffic by 163 trips per day. These vehicle trips would account for the majority of operational emissions associated with the proposed project. Other operational emissions include area source emissions associated with natural gas combustion for residential heating and cooking, landscaping, and consumer products such as household cleaners and personal care products. However, operational emissions associated with the proposed project would not exceed SCAQMD thresholds of significance. Impacts would be less than significant.

- c) **Less-Than-Significant Impact.** The SCAQMD’s approach for assessing cumulative air quality impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Act (CAA). The SCAQMD has set forth regional significance thresholds designed to assist in the attainment of ambient air quality standards. Short- and long-term emissions resulting from the proposed project are not predicted to exceed district thresholds and not result in a cumulative net increase in criteria pollutants above AQMD thresholds. Impacts would be less than significant.
- d) **Less-Than-Significant Impact.** The proposed project consists of a residential use, and consequently, is not likely to expose sensitive receptors to substantial pollutant concentrations. In addition, emissions from the proposed project are not likely to exceed AQMD thresholds. Impacts would be less than significant.
- e) **Less-Than-Significant Impact.** Potential sources that may emit odors during construction activities include equipment exhaust and architectural coatings. Odors from these sources would be localized and generally confined to the project site. The proposed project would utilize typical construction techniques and the odors would be typical of most construction sites. Additionally, the odors would be temporary and construction activity associated with the proposed project would be required to comply with SCAQMD Rule 402. A less-than-significant impact relative to an odor nuisance would occur during construction of the proposed project.

According to the SCAQMD CEQA Air Quality Handbook, land uses that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project would not include any of these uses. Therefore, it is unlikely that the proposed project would generate objectionable odors affecting a substantial number of people. Impacts would be less than significant.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES – Would the project:				

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **No Impact.** The project site is located in an urbanized area and is currently vacant. The project site does not contain any natural habitat or species identified as a candidate, sensitive, or of special status. Therefore, no impact would occur.
- b) **No Impact.** The project site and surrounding area is in a highly urbanized, developed portion of the City of Lawndale. No riparian habitat or other sensitive natural communities exist on-site, and no bodies or courses of water to provide habitat for fish exist on or adjacent to the project site. Therefore, no impact would occur.
- c) **No Impact.** As discussed above, the project site is primarily vacant and is located in an urbanized area of Lawndale that is developed with commercial and industrial uses. No wetland features exist on or adjacent to the project site. Therefore, no impact would occur.
- d) **No Impact.** The project site and surrounding area is highly urbanized. Furthermore, the project site is treeless and primarily vacant and does not function as a wildlife corridor. Therefore, no impact would occur.
- e) **No Impact.** The existing site is primarily vacant and does not contain any trees or other biological resources; however, as part of the project, the applicant will be required to install street trees as a site improvement. No impact would occur.
- f) **No Impact.** As discussed above, the project site is located in an urbanized area of Lawndale and is not located in, or adjacent to, an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan. The nearest plan, a Natural Community Conservation Plan, for the City of Rancho Palos Verdes, is located over nine miles south of the proposed project. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

Comments:

- a) **No Impact.** There are no historical resources on or located within 0.5 miles of the project site. Therefore, no impact would occur.
- b) **Less-Than-Significant Impact with Mitigation Incorporated.** A significant impact would occur if a known or unknown archaeological resource were removed, altered, or destroyed as a result of the proposed development. Archaeological resources are unlikely to be present; however, since unknown resources could be altered or destroyed by site excavation or other construction activities, discovery of archeological resources during construction shall be treated in accordance with applicable federal, State, and local guidelines. Therefore, with the implementation of Mitigation Measure **CR1**, impacts will be less than significant.
- c) **No Impact.** The proposed project does not involve excavation for subterranean parking or any other deep grading activities. As such, construction of the proposed project would not extend into older fossil-bearing deposits or unique geologic strata. Rather, grading would be limited to younger surficial soils. Therefore, the proposed project would not destroy a unique paleontological resource or unique geologic feature. No impact would occur.
- d) **Less-Than-Significant Impact.** The project site is not known or expected to have been used for the interment of human remains. Nonetheless, if such remains are encountered during project construction, California Health and Safety Code § 7050.5 requires construction to stop until the County Coroner has made the necessary findings as to the origin and disposition of the remains, complying in turn with Public Resources Code § 5097.98. Compliance with these regulations would ensure the proposed project would not result in significant impacts due to disturbing human remains. See also response to V b), above.

Mitigation Measures:

CR1 In the event that archaeological resources and/or human remains are encountered during grading or excavation, all earth-moving activities shall cease until the archaeological resources are properly assessed and an appropriate treatment plan is determined by a qualified archaeologist. If human remains are discovered, there shall be no disposition of such human remains, other than in accordance with the procedures and requirements set forth in California Health and Safety Code § 7050.5 and Public Resources Code § 5097.98. Notification is required of the County Coroner and the Native American Heritage Commission, who in turn must notify those persons believed to be the most likely descendant from the deceased for appropriate disposition of the remains.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems, where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) i) **Less-Than-Significant Impact with Mitigation Incorporated.** No known faults or fault-related features are located within the City of Lawndale. Therefore, ground rupture would not be expected to occur. However, the proposed project will be required to comply with the seismic safety requirements in the California Building Code (CBC) and the California Geological Survey Special Publication 117. These regulations establish requirements for evaluating and mitigating earthquake-related hazards, along with mandating a geotechnical report for the project site. Compliance with such requirements, as determined by the City’s Building and Safety Division, will reduce impacts attributable to fault rupture to the maximum extent practicable with current engineering practices. Therefore, with incorporation of Mitigation Measure **GSI**, impacts will be less than significant.
- ii) **Less-Than-Significant Impact.** The project site is located within the seismically active area of Southern California and strong ground shaking due to seismic activity is anticipated at the project site. Numerous regional and local faults are capable of producing severe earthquakes of magnitude 6.0 or greater. While no known fault lines exist within the City of Lawndale, additional subsurface faults in the area include the Newport-Inglewood Fault Zone, which is located about two miles from the City, and the Whittier-Elsinore Fault Zone, located 15 miles from the City. As discussed above, the proposed project would be required to comply with the seismic safety requirements in the CBC. Compliance with such requirements would reduce seismic ground shaking impacts to the maximum extent practicable with current engineering practices. Impacts would be less than significant.

iii) **Less Than Significant Impact.** Soil liquefaction occurs when loose, saturated, granular soils lose their inherent shear strength due to excess water pressure that builds up during repeated movement from seismic activity. Factors that contribute to the potential for liquefaction include a low relative density of granular materials, a shallow groundwater table, and a long duration and high acceleration of seismic shaking. Liquefaction usually results in horizontal and vertical movements from lateral spreading of liquefied materials and post-earthquake settlement of liquefied materials. Liquefaction potential is greatest where the groundwater level is shallow, and submerged loose, fine sands occur within a depth of approximately 50 feet or less. The project site is not located in an area known to be susceptible to liquefaction. Compliance with the City's established building standards, as well as adherence to the requirements contained in a site-specific geotechnical investigation shall be undertaken. Therefore, impacts would be less than significant.

iv) **Less Than Significant Impact.** The project site is located in a relatively flat alluvial plain several miles from any hills or mountains, meaning the probability of seismically-induced landslides occurring is considered to be low. Therefore, impacts would be less than significant.

- b) **Less-Than-Significant Impact with Mitigation Incorporated.** Erosion could occur during the grading phase of the proposed project. All grading activities will require grading permits from the City of Lawndale Building and Safety Division. During the construction phases of the proposed project, activities are subject to requirements of the National Pollutant Discharge Elimination System (NPDES) Construction Permit. Compliance with the NPDES permit includes the implementation of Best Management Practices (BMPs), some of which are specifically implemented to reduce soil erosion or loss of topsoil. BMPs must be put into practice at the time of demolition of an existing structure, or at the start of new construction, and will remain in place until a certificate of occupancy has been issued. In addition to the NPDES permit, grading, excavation, and fill activities require a local Storm Water Pollution Prevention Plan (SWPPP) and a Wet Weather Erosion Control Plan (WWECP) to be developed for the proposed project. The SWPPP would require implementation of an erosion control plan to reduce the potential for wind or waterborne erosion during the construction process. No continued erosion potential would exist after completion of construction. With implementation of Mitigation Measures **GS2**, **GS3**, and **GS4**, impacts would be less than significant.
- c) **Less-Than-Significant Impact.** The project site is located in a relatively flat urbanized area. The project site is not located in a hilly area susceptible to landslides. Prior to the approval of final plans, the geotechnical report mentioned in Mitigation Measure **GS1** shall conclude if the project site is appropriate for the intended development. During grading, investigation of soil stability and implementation of required grading practices shall be required. Compliance with the City's grading regulations will ensure that no substantial erosion will occur during grading and compaction of the site. If unstable soils are identified during grading, the condition will be mitigated in accordance with the recommendation of the project geologist or civil engineer and the requirements of the City Engineer and Building Official. Therefore, impacts would be less than significant.
- d) **Less-Than-Significant Impact.** If expansive soil is identified during the soil study prepared under Mitigation Measure **GS1**, such soil will not be used for compaction purposes. Such expansive soils shall be stockpiled separately and removed from the site. This construction technique is standard practice for the preparation of building sites. Therefore, impacts would be less than significant.
- e) **No Impact.** The project site is currently served by a public sewer system. The proposed project shall be connected to this public sewer system. Septic tanks and other alternative wastewater disposal systems are not required or necessary for the proposed project. No impact would occur.

Mitigation Measures:

- GS1** Prior to the approval of final plans, a geotechnical report including a soil study, shall be conducted by a certified engineering geologist or civil engineer pursuant to California Public Resources Code Section 2695(a). The report

shall conclude if the project site is appropriate for the intended development and if any further mitigation measures are required.

GS2 The applicant shall implement construction Best Management Practices (BMPs) as set forth by the City. Such BMPs shall include, but are not limited to, using plastic coverings to prevent erosion of any unprotected area, such as mounds of dirt or dumpsters, along with devices designed to intercept and safely divert runoff.

GS3 To the extent feasible, grading shall be scheduled for completion prior to the start of the rainy season (between November and April).

GS4 During inclement periods of the year, when rain is threatening (between November and April), an erosion control plan that identifies BMPs shall be implemented to the satisfaction of the City’s Building and Safety Division to minimize potential erosion during construction. The erosion control plan shall be a condition prior to issuance of any grading permit.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **Less-Than-Significant Impact.** The proposed project includes the construction of a 26-unit condominium complex. This use would not involve the routine transport, use, or disposal of hazardous substances other than typical household solvents and minor amounts of herbicides or pesticides that would be used for landscaping. Typical household solvents include paints, wood finishes, glues/adhesives, and degreasers. Therefore, impacts would be less than significant.
- b) **Less-than-Significant Impact with Mitigation Incorporated.** Hazardous materials could be released during the demolition phase of the proposed project. Due to the age of the existing structure, it is possible that asbestos and lead based paint are present. With implementation of Mitigation Measures **HM1** and **HM2**, impacts will be less than significant.
- c) **Less-than-Significant Impact with Mitigation Incorporated.** The nearest school to the project site is Jane Addams Elementary School located approximately 525 feet to the west of the project site. The proposed project includes a typical residential use and would not emit hazardous materials. However, as described in VII b) above, the demolition of the existing structure has the possibility to cause a significant hazard impact to the nearby school, specifically during the demolition phase. With implementation of Mitigation Measures **HM1** and **HM2**, impacts will less than significant.
- d) **No Impact.** The project site is not identified on the Cortese List (Government Code Section 65962.5). Therefore, no impact would occur.
- e) **No Impact.** The project site is not located within an airport plan boundary. The nearest public airport is the Hawthorne Municipal Airport located approximately 2.1 miles northeast of the project site. The project site is not located within the Hawthorne Airport flight path safety zone. Therefore, no impact would occur.
- f) **No Impact.** The project site is not located within the vicinity of any private airstrips. The proposed project would not pose a hazard to approaching airplanes. Therefore, no impact would occur.
- g) **No Impact.** The proposed project would not involve any uses that would interfere with the City's Emergency Operations Plan. W. 153rd Street and Grevillea Avenue are local streets with Hawthorne Boulevard being the closest major street to the project site for emergency evacuation. The proposed project would not alter street patterns associated with the major emergency evacuation routes. Therefore, no impact would occur.
- h) **No Impact.** The project site is located in an urbanized area of Lawndale surrounded by urban uses and is not located in the vicinity of any wildfire areas. The proposed project would not subject people or structures to a significant risk of loss, injury, or death as a result of exposure to wildland fires. Therefore, no impact would occur.

Mitigation Measures:

- HM1** The applicant shall ensure that any positively identified asbestos containing materials (ACM) in the single-family residence located at 4440 W. 153rd shall be disposed of in accordance with OSHA programs and regulations.
- HM2** Prior to issuance of a demolition permit, lead-based paint testing shall be conducted on the existing structure. All materials identified as containing lead shall be removed by a licensed lead-based paint/materials abatement contractor.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY – Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **Less-Than-Significant Impact.** Construction activities such as earth moving, maintenance/operation of construction equipment, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff. However, as previously discussed, the project will be subject to the NPDES General Construction Activity Permit. In accordance with the requirements of the permit, the applicant would prepare and implement a site specific SWPPP. The SWPPP would specify BMPs to be used during construction; these would include but not be limited to erosion control, sediment control, and non-stormwater management and materials management BMPs.

In accordance with NPDES requirements, the applicant would be required to prepare and implement Stormwater Management Plan requirements throughout the operational life of the proposed project. Stormwater BMPs to address water quality in stormwater runoff would be incorporated into the design of the proposed project. BMPs would include source control and treatment control BMPs. Source control BMPs would be used to prevent pollutants from entering into the stormwater discharges and may include effective site design and landscape

planning, storm drain signage, properly managed trash storage areas, and proper maintenance of structural/treatment control BMPs. Treatment BMPs remove pollutants from stormwater discharges and may include catch basins, infiltration/retention, cisterns for collection and reuse of rainwater, and pervious pavement.

With implementation of source control and treatment BMPs such as those described above, the proposed project would reduce or eliminate the discharge of potential pollutants from the stormwater runoff to the maximum extent practicable. Therefore, operation of the proposed project would not result in a violation of water quality standards or discharge requirements. Impacts would be less than significant.

- b) **Less-Than-Significant Impact.** The proposed project would be expected to increase water usage compared to existing conditions. Potable water would be supplied by the Golden State Water Company, which draws its local water supplies from groundwater and imported supplies from the Metropolitan Water District of Southern California. The City of Lawndale is served by the Southwest District Customer Service Area of the Golden State Water Company. This service area has issued a letter noting that system modifications may be required to provide adequate water supply to the project, which the applicant would be required to undertake.

In addition, the project site is located within the West Coast Basin. This basin is adjudicated and is therefore regulated by a Watermaster, the California Department of Water Resources, Southern District. The Watermaster Program ensures that water is allocated by established rights and that only safe yields are produced from the basin. This guarantees that the groundwater levels will not be depleted. Groundwater use as a result of implementing the proposed project would be in accordance with existing plans and projections of the Department of Water Resources and would not substantially deplete groundwater supplies.

A majority of the aquifers within the West Coast Basin are confined. A confined aquifer is located between layers of impermeable materials, such as clay, which impede the movement of water into and out of an aquifer. Because of this, aquifers in the West Coast Basin receive the majority of their natural recharge from adjacent groundwater basins or from the Pacific Ocean (seawater intrusion).

The improvements that would occur as part of implementing the proposed project would include a rear yard, side yards, and courtyards that would be landscaped allowing water to percolate through the soil and potentially recharge groundwater supplies. However, due to the confined aquifers in the West Coast Basin, only little or no groundwater recharging is possible. Therefore, impacts related to ground water would be less than significant.

- c) **Less-Than-Significant Impact with Mitigation Incorporated.** The project site is located in a highly developed area of Lawndale. There are no streams or rivers located in the proposed project's vicinity. However, the proposed project includes an increase in the number of residential units from existing conditions. Project construction would temporarily expose on-site soils to surface water runoff. However, compliance with the BMPs listed in Mitigation Measure **GS3** will eliminate erosion and siltation.

During project operation, stormwater or any runoff irrigation waters would be directed into existing storm drains that currently receive surface water runoff. Drainage is carried through underground storm sewers to the Pacific Ocean. Alterations to existing drainage patterns are not expected to occur. Construction activities for the proposed project would include appropriate storm drain connections and implementation of BMPs, as listed in Mitigation Measure **GS3**, related to stormwater flows. Therefore, impacts would be less than significant.

- d) **Less-Than-Significant Impact.** As discussed above, the project site is located in a highly developed area of Lawndale and is not near a stream or river. The surrounding area has an existing curb and gutter system to handle runoff. Any alteration of flows on-site would be controlled and then conveyed to existing off-site regional storm drain facilities by temporary flood control improvements. As a result, street surface flow would remain the same and the proposed project would not result in flooding on- or off-site. Impacts would be less than significant.

- e) **Less-Than-Significant Impact.** A significant impact would occur if runoff water exceeded the capacity of existing or planned storm drain systems serving the project site. A project-related significant adverse effect would also occur if a project would substantially increase the probability that polluted runoff would reach the storm drain system. The proposed project would result in a change from a primarily vacant lot with sparse vegetation to a residential use with minimal landscaping and associated open space. As a result, storm flows on the project site could be slightly increased across the site due to an increase in impermeable surfaces. In general, this would increase the amount of stormwater that would be conveyed to the existing storm drain system compared to existing conditions; however, the impacts would be less than significant.
- f) **Less-Than-Significant Impact.** As discussed above in VII a), project construction and operations would be required to comply with applicable federal, State, and local regulations, as well as code and permit provisions in order to prevent violation of water quality standards or waste discharge requirements. The use associated with the proposed project is residential and would not be expected to degrade water quality. Impacts would be less than significant.
- g) **No Impact.** The project site is not within a 100-year flood hazard area. Therefore, no impact would occur.
- h) **No Impact.** The proposed project would not place a structure within a 100-year flood hazard area. Therefore, no impact would occur.
- i) **No Impact.** The project site is not located in a flood plain, or near a dam or levee. Therefore, no impact would occur.
- j) **No Impact.** The project site is located more than three miles inland from the coast at an elevation of approximately 58 feet Mean Sea Level (MSL). The possibility of a tsunami affecting the project site is considered to be remote. Similarly, damage to the project site due to a seiche is not likely at the project site because no bodies of water are present near the site. Furthermore, the project site, which is not located within a hilly area or positioned down slope from any unprotected slopes or landslide areas, is not positioned in an area of potential mudflow. Therefore, no impact would occur.

Mitigation Measures:

Refer to Mitigation Measure **GS3** above.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. LAND USE AND PLANNING – Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **No Impact.** A significant impact would occur if the proposed project were sufficiently large or configured in such a way so as to create a physical barrier within an established community. Residential uses are located immediately adjacent to the project site on the south and west, commercial uses are located immediately adjacent on the east, and light industrial/warehousing uses are located adjacent to the site on the north, across 153rd Street. The project is a medium density residential development and fits within the residential fabric around the site. No new street patterns are proposed, and the proposed project would not block access to an established community. Therefore, no impact would occur.
- b) **No Impact.** A significant impact would occur if the proposed project were inconsistent with applicable plans, policies, and zoning designations. Various local plans guide development of the project site. At the local level, the Lawndale General Plan implements land use policies for the project site and vicinity. The Lawndale Municipal Code governs land use at the project site through development restrictions and building standards. The project site is currently vacant and is zoned for residential high density uses (R-3). The proposed condominium complex is permitted within the R-3 zoning district and is consistent with the General Plan. Therefore, no impact would occur.
- c) **No Impact.** The project site is located in a highly urbanized area of Lawndale. No habitat conservation plans or community conservation plans are currently applicable to the project site. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **No Impact.** The project site is located in an urbanized area of the City. The nearest mineral resource is the Lawndale Oil Field located under the northwest corner of the City. The project site is located approximately 930 feet from the edge of the oil field. The existing zoning classifications do not allow for any oil drilling land use, consequently, the project site would not be available for future drilling activities. Therefore, no impact would occur.
- b) **No Impact.** As stated above, the proposed project is not known to contain any significant mineral resources. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. NOISE – Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **Less-Than-Significant Impact with Mitigation Incorporated.** A significant impact would result if the proposed project caused the ambient noise level measured at the property line of the affected uses to exceed the exterior noise standards at the property line.

City of Lawndale Noise Standards

The City of Lawndale General Plan identifies California Administrative Code, Title 24, Section 3501 as a threshold for new residential structures. The Code requires that new residential structures located where the Community Noise Equivalent Level (CNEL), the average sound level during a 24-hour day, exceeds 60 dBA must have an acoustical analysis performed to ensure that the proposed design will limit the interior noise level to 45 dBA or below in any habitable room. In addition, the City of Lawndale Municipal Code states that interior unit noise levels shall not exceed 40 dBA CNEL. The minimum sound insulation for walls and floor/ceiling assemblies separating units from each other or from public or quasi-public spaces, such as interior corridors, laundry rooms, recreation rooms, parking spaces, etc., shall provide airborne sound insulation, impact sound insulation, and isolation of vibration and sources of structure-borne noise (including shock mounting of mechanical equipment). The Lawndale Municipal Code requires that construction activity occur between 7:00 a.m. and 7:00 p.m. on weekdays, and 8:00 a.m. to 5:00 p.m. on Saturdays. Construction activity is prohibited all other hours.

Existing Ambient Noise Levels

The existing noise environment of the project area is characterized by vehicular traffic and noises typical to a dense urban area (e.g., sirens, horns, helicopters, etc.). Vehicular traffic is the primary source of noise in the project vicinity, and includes pick-up and drop-off activity associated with the light industrial uses (medium and heavy-duty trucks) immediately to the north of the project site.

Construction Noise

Construction activities would include demolition of structures, rough grading, installation of new utilities, construction of structures, paving (concrete and asphalt), installation of fencing and landscaping, and street and infrastructure improvements. Total construction time is estimated to be approximately one year, and buildout of the proposed project is anticipated to occur in January 2017.

Construction activities require the use of numerous noise-generating equipment, such as jackhammers, pneumatic impact equipment, saws, and tractors. The highest noise levels are expected to occur during the grading/excavation, and building and finishing phases of construction, which typically generate a noise level of 89 dBA at a reference distance of 50 feet. However, noise levels would fluctuate depending on construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers.

Operational Noise

The City of Lawndale exterior noise standards for residences is 60 dBA. The proposed project is not anticipated to generate any vehicular noise above 60 dBA. Mobile noise levels would not audibly increase along any roadway segment due to operation of the proposed project. Vehicular noise would result in a less-than-significant impact.

A second source of noise in the project area is area sources associated with industrial or commercial land uses. The City of Lawndale Municipal Code requires that interior noise levels shall not exceed 40 dBA CNEL for residential units.

Implementation of Mitigation Measures **N1** and **N2** will reduce construction noise levels by at least 15 dBA during ground-level construction, and will reduce the temporary ambient noise level increase to less than 5 dBA. Impacts will be less than significant. Implementation of Mitigation Measure **N3** will insure the residential units will be in compliance with the City of Lawndale Municipal Code. This will insure that area source impacts associated with commercial and industrial land uses will be less than significant.

- b) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project caused excessive groundborne vibration or noise levels. High levels of vibration may cause physical personal injury or damage to buildings. However, groundborne vibration levels rarely affect human health. Instead, most people consider groundborne vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of groundborne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes).

Construction Vibration

The use of heavy equipment (e.g., a large bulldozer) generates vibration levels of 0.089 inches per second at a distance of 25 feet. The nearest residential structures to the project site would be approximately 25 feet from occasional heavy-duty equipment activity and could experience vibration levels of 0.004 inches per second. Vibration levels at these receptors would not exceed the potential building damage threshold of 0.5 inches per second.

Operational Vibration

Operational ground-borne vibration in the project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, project-related vibration levels would not be perceptible by sensitive receptors. Impacts would be less than significant.

- c) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project caused a substantial permanent increase in noise levels above existing ambient levels. As discussed in XI a) above, the proposed project would not permanently increase ambient noise levels. Impacts would be less than significant.
- d) **Less-Than-Significant Impact with Mitigation Incorporated.** A significant impact would occur if the proposed project resulted in substantial temporary or periodic increase in ambient noise levels. As discussed in XI a), temporary and intermittent noise from construction equipment may increase the ambient noise levels in the vicinity. However, implementation of Mitigation Measures N1 and N2 will reduce potential impacts to a less-than-significant level.
- e) **No Impact.** The project site is not located within two miles of a public airport or public use airport and is not located within an adopted airport land use plan. The proposed project would not expose people residing or working in the project area to excessive noise levels related to airport noise. Therefore, no impact would occur.
- f) **No Impact.** The project site is not located in the vicinity of a private airstrip. The proposed project would not expose people residing or working in the project area to excessive noise levels related to the operation of an airstrip. Therefore, no impact would occur.

Mitigation Measures:

- N1** The construction contractor shall implement the use of sound blankets on the perimeter of the proposed project’s property line. The sound blankets shall be at least ten feet high, and capable of blocking at least 15 dB of construction noise. The blankets shall be placed such that the line-of-sight between ground-level construction activity and sensitive land uses is blocked.
- N2** The construction contractor shall implement the use of residential-grade mufflers on all construction equipment.
- N3** Prior to issuance of a Certificate of Occupancy, a qualified acoustical engineer shall verify that interior noise levels are below 40 dBA CNEL.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. POPULATION – Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

Comments:

- a) **Less-Than-Significant Impact.** A potentially significant impact would occur if the proposed project induced substantial population growth that would not have otherwise occurred as rapidly or in as great a magnitude. The proposed project includes 26 condominium units. According to the most recent Southern California Association of Governments (SCAG) profile of the City of Lawndale, the average household size in Lawndale in 2014 was

3.4 persons per household. Based on this number, the proposed project would have a likely population of 89 residents. The 2014 population of Lawndale was 33,228 persons and an 89 person increase would represent less than a one percent increase in population.

The projected growth rate for the City of Lawndale is just over 2.5 percent per every five years through the year 2040. A 2.5 percent growth increase from the 2014 population is 831 persons. If the proposed project housed 89 residents in its first year of operation, it would represent 11 percent of the five year growth rate for the City. This allows for growth from other projects within the City and is consistent with the SCAG population forecast for the City of Lawndale. Therefore, impacts would be less than significant.

- b) **Less-Than-Significant Impact.** The proposed project would be built on an existing primarily vacant site that includes a parcel with one single-family residence, which will be replaced by the project. Therefore, impacts will be less than significant.
- c) **Less-Than-Significant Impact.** As stated above, the project site is primarily vacant with the exception of one single-family residence. Consequently, the proposed project would displace only two on-site residents. Therefore, impacts will be less than significant.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
Parks?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

Comments:

- a) i) **Less-Than-Significant Impact.** The LA County Fire Department provides fire protection services in the City of Lawndale. Fire Station #21, located at 4312 W. 147th Street in Lawndale, would be the first respondent to the project site in the event of an emergency. Fire Station #21 is located less than 0.5 miles from the project site and can provide a response time of two to three minutes. This station is staffed with five persons and provides fire engine and paramedic rescue response services. The secondary responder would be Fire Station #160, located at 5323 W. Rosecrans Avenue in Hawthorne. This station is located just over 1.5 miles from the project site and is

staffed with three persons, providing fire engine response services. It would have a response time of five to six minutes.

The Los Angeles County Fire Department requires a minimum street width of 20 feet in order to ensure adequate access. W. 153rd Street, which would serve as the access street for the proposed project, is just over 25 feet wide. Parking is permitted on the north side of the street. This helps in maintaining a 20-foot-wide corridor along W. 153rd Street. The proposed project would be subject to the site plan review requirements of the County Fire Department to guarantee that required fire protection safety features, such as building sprinklers and emergency access, are implemented. Impacts would be less than significant.

ii) **Less-Than-Significant Impact.** The Los Angeles County Sheriff's Department is contracted to provide police protection services for the City. Two stations serve the City, the Lawndale Service Center Substation, located at 15331 Prairie Avenue in Lawndale, and the Sheriff's Department South Los Angeles Station, located at 1310 W. Imperial Highway in Los Angeles. Lawndale has currently contracted for a daytime patrol of three crime units, two motorcycle police, and one traffic unit. Nighttime patrols consist of five crime units. The City of Lawndale has an open contract with the LA County Sheriff's Department in that if they decide to pay for more patrolling officers, the Sheriff's Department has the resources to quickly provide the service. Likewise, the City could decrease service at any time.

The County Sheriff's Department periodically analyses the operating performance for their contracted cities. During this analysis they determine the minimum operating standards for each patrol area and advise the cities accordingly. For security reasons this information is not released to the public. Nevertheless, the relatively small increase in population from the proposed project would have a less-than-significant impact on the ability of the Sheriff's Department to adequately serve the proposed project. Impacts would be less than significant.

iii) **Less-Than-Significant Impact.** There are two school districts that serve the City, the Lawndale Elementary School District (LESD) and the Centinela Valley Union High School District (CVUHSD). The LESD is comprised of six elementary schools, two middle schools, and one charter high school. The LESD serves approximately 6,200 kids. The CVUHSD has a student population of approximately 7,300, and students attend either Hawthorne, Lawndale, or Leuzinger High Schools for comprehensive secondary programs, or Lloyde High School, Centinela Valley Adult School, or Independent Study High School for continuation programs.

Based on the 26 total units provided in the proposed project, there would be approximately 13 elementary school kids entering the LESD (less than one percent increase), and 6 high school students entering CVUHSD (less than one percent increase).¹ The LESD is not near maximum capacity and has seen declining enrollment numbers over the past five years. Therefore, it would be able to accommodate new students from the proposed project. Similar to the LESD, enrollment numbers for the CVUHSD have been declining over recent years. Therefore, it would be able to accommodate new students from the proposed project.

In addition, the applicant would be required to follow State law and pay school impact fees. Pursuant to Section 65995(3)(h) of the California Government Code (Senate Bill 50, chaptered August 27, 1998), the payment of statutory fees "...is deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization." Therefore, impacts would be less than significant.

iv) **Less-Than-Significant Impact with Mitigation Incorporated.** A significant impact would occur if the proposed project exceeded the capacity or capability of the local park system to serve the proposed project. The City of Lawndale has two types of parkland, city parks and school parks. City parks consist of 3.08 acres, and

¹ Student generation rates used from the Lawndale General Plan EIR are 0.5 students per dwelling unit in the LESD, and 0.2 students per dwelling unit in the CVUHSD.

school parks consist of 14.7 acres, for a total of 17.78 acres. Given the 2014 population of 33,228, this equals 0.54 acres of parkland per 1,000 persons. This is a deficiency based on the recommended 2.5 acres of parkland per 1,000 persons cited in the General Plan Update EIR. Based on the proposed project having a population of 89 residents and the General Plan recommendation of 2.5 acres of parkland per 1,000 persons, the proposed project would require 0.22 acres of additional parkland. Based on the City's current ratio of parkland per person (0.54 acres of parkland per 1,000 person), the proposed project would require 0.05 acres of additional parkland.

The developer is required to pay the appropriate park impact fee as required by Chapter 12.34, Park Development Fees, of the Lawndale Municipal Code. However, the park development fee, which funds the maintenance and development of parks, does not reflect current market conditions and would only yield \$10,400. Based on current land values in the City, this is not enough money to buy 0.22 acres of parkland required by the proposed project and recommended by the General Plan. Therefore, the developer will be required to pay additional fees to mitigate the impact of the proposed project on the City's parks. With implementation of Mitigation Measure **PS1**, impacts will be less than significant.

v) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project includes substantial employment or population growth that could generate a demand for other public facilities (such as libraries), which exceed the capacity available to serve the project site, necessitating new or physically altered public facilities, the construction of which would cause significant environmental impacts.

The Lawndale Library is located 0.4 miles north of the project site. The facility is 17,300 square feet and offers many services such as reference assistance, electronic databases and other online information, public access Internet computers, WiFi, a Career Center, Technology Lab, and library programs for all ages. This library would be adequate to serve the proposed project, and the construction of new facilities would not be required.

The proposed project would contribute incrementally toward impacts to the City's Public Services and facilities such as storm drain, solid waste disposal, water usage, and wastewater disposal. The proposed project's contribution is offset through payment of fees that are used to fund storm drain improvements and school facility expansions, among other things. Impacts would be less than significant.

Mitigation Measures:

PS1 Prior to the issuance of the building permits, the developer shall pay a fee equal to the amount needed to purchase 0.05 acres of parkland required by the proposed project (the amount of parkland is calculated using the current ratio of parkland per person) to mitigate the impact of the proposed project on the City's parks. This mitigation payment shall include the amount payable to the City pursuant to the City's park development fee such that the City's park development fee is not charged in addition to this fee.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

- a) **Less-Than-Significant Impact with Mitigation Incorporation.** The proposed project would increase the number of residents and, therefore, will increase demand on nearby parks including Jane Addams Park and Rogers-Anderson Park. The developer is required to pay the City’s park development fee. However, as mentioned above in Section XIII a) iv), the City’s park impact fee is not adequate to provide the amount of parkland recommended by the General Plan. Therefore, the developer will be required to pay additional fees to mitigate the impact of the proposed project on the City’s parks. With implementation of Mitigation Measure **PS1**, impacts will be less than significant.

- b) **Less-Than-Significant Impact with Mitigation Incorporated.** The proposed project does not include the construction or expansion of recreational facilities. The developer is required to pay the City’s park development fee. However, as mentioned above in Section XIII a) iv), the City’s park impact fee is not adequate to provide the amount of parkland recommended by the General Plan. Therefore, the developer will be required to pay additional fees to mitigate the impact of the proposed project on the City’s parks. With implementation of Mitigation Measure **PS1**, impacts will be less than significant.

Mitigation Measures:

Refer to Mitigation Measure **PS1** above.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC – Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

a) **Less-Than-Significant Impact.** A Traffic Impact Analysis (TIA) was prepared for the project by Willdan Engineering in August 2015. This TIA is included as Appendix A of this Initial Study. As identified in the TIA, the proposed project is expected to generate the following amount of net trips:

- Weekday: 163 daily trips, including 12 during the AM peak hour and 15 during the PM peak hour.

The project TIA evaluated potential traffic impacts on the following 8 intersections:

1. Grevillea Avenue / Marine Avenue
2. Grevillea Avenue / 153rd Street
3. Hawthorne Boulevard (Southbound) / 153rd Street
4. Hawthorne Boulevard (Northbound) / 153rd Street
5. Grevillea Avenue / 154th Street
6. Hawthorne Boulevard / 154th Street
7. Hawthorne Boulevard / Marine Avenue (signalized)
8. Hawthorne Boulevard / Marine Avenue (signalized)

The proposed project did not meet the criteria that require investigations of Los Angeles County Congestion Management Plan (CMP) intersections or CMP freeway locations and, as such, none of the investigated intersections are CMP intersections.

To determine the proposed project's impacts on these intersections, the level of service (LOS) of the eight investigated intersections were evaluated under the following scenarios for both weekdays and weekends:

- Existing Conditions—Year 2015;
- Future Pre-Project Conditions—Year 2017 plus ambient growth plus cumulative projects; and
- Future with Project Conditions—Year 2017 plus ambient growth plus cumulative projects plus project.

Table 1 of the TIA identifies the LOS and the Intersection Capacity Utilization (ICU) delay values for these scenarios, and identifies the change in ICU delay that would be caused by the proposed project. As shown in this table, the proposed project would not cause any significance thresholds to be exceeded. Therefore, the proposed project would not cause a substantial increase in traffic and would not exceed any LOS standards. Therefore, impacts will be less than significant.

- b) **No Impact.** The project will not result in traffic generation above the planned system capacity; therefore, no significant impacts would occur and no mitigation measures will be required.
- c) **No Impact.** The project does not propose any use that could cause any changes to air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks. Therefore, no significant impacts would occur and no mitigation measures will be required.
- d) **No Impact.** The proposed project will not create or increase the hazards to a design feature, or include the use of incompatible uses. Therefore, no impact would occur.
- e) **No Impact.** The Los Angeles County Fire Department provides fire protection services in the City of Lawndale. The proposed project shall comply with all fire department requirements. In addition, the proposed project would not result in inadequate emergency access, as the LA County Fire Department would review the site plan to ensure that required fire protection safety features, including adequate emergency access, are implemented. Therefore, no impact would occur.

- f) **Less-Than-Significant Impact.** The project will provide adequate on-site parking facilities for the project’s occupants and visitors, as required by the Lawndale Zoning Code. The proposed project includes 67 onsite parking spaces, which includes 15 visitor parking spaces. The proposed project would not cause any significant parking impacts and no mitigation measures will be required.
- g) **No Impact.** The project will not conflict with alternative transportation policies, plans, or programs. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures will be required.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS – Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **Less-Than-Significant Impact.** The proposed project would require connection to the public sewer system. As a result, the proposed project is required to obtain approvals from the local water company and the County Sanitation District. The proposed project would result in an increased amount of wastewater generation. The proposed project has the potential to increase wastewater generation by approximately 5,070 gallons per day.² The existing single-family residence generates approximately 260 gallons per day. Therefore, a net increase of about 4,810 gallons of water per day would occur. However, when last measured in 2008, the trunk sewer that serves the project site conveyed a peak flow of 5.8 million gallons day (mgd). This trunk sewer has a capacity of 12.9 mgd. In addition, wastewater generated by the proposed project would be treated at the Joint Water Pollution Control Plant located in the City of Carson. This plant has a design capacity of 400 mgd and currently

² Based on wastewater generation factors from the Los Angeles County Sanitation Districts (LACSD), available at, <http://www.lacsd.org/civica/filebank/blobload.asp?BlobID=3531>.

processes an average flow of 277.4 mgd. Both the local sewer system and wastewater treatment plant are able to accommodate the wastewater associated with the proposed project. Therefore, impacts would be less than significant.

- b) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project would increase water consumption or wastewater generation to such a degree that the capacity of facilities currently serving the project site would be exceeded. The proposed project would result in an increase in water use and wastewater generation. Based on the answer to XVI a) above, wastewater capacity would not be exceeded. Also, the will serve letter from the Golden State Water Company states that water will be available for the proposed project. Impacts would be less than significant.
- c) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project increased surface water runoff, resulting in the need for expanded off-site stormwater drainage facilities. As discussed above in section VIII b), the proposed project would include drainage controls and implementation of BMPs in accordance with City requirements. Since the existing drainage system is not operating near capacity, stormwater pipes and connections linking the proposed project to the regional conveyance system would not need to be expanded. Impacts would be less than significant.
- d) **Less-Than-Significant Impact.** A significant impact would occur if a project were to increase water consumption to such a degree that new water sources would need to be identified or that existing resources would be consumed at a greater pace than planned by purveyors, distributors, and service providers. Potable water for the proposed project would be supplied by the Golden State Water Company, which draws its water supplies from local groundwater and from the Metropolitan Water District of Southern California. The Golden State Water Company has issued a will serve letter indicating that there is sufficient water supply to meet the proposed project's demand. Impacts would be less than significant.
- e) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project would increase wastewater generation to the degree that the capacity of facilities currently serving the project site would be exceeded. The proposed project would increase wastewater generation. However, as stated in the answer to XVI a) above, the County Sanitation Districts of Los Angeles have affirmed that both the local sewer lines and wastewater treatment facility serving the project site are capable of handling the anticipated wastewater increase. Impacts would be less than significant.
- f) **Less-Than-Significant Impact.** A significant impact would occur if the proposed project's solid waste generation exceeded the capacity of permitted landfills. The proposed project would represent an increase in residential development and a net increase in solid waste generation for the proposed project. In 2008, Lawndale's solid waste was disposed at 12 different landfill facilities throughout Southern California. Combined, these landfills have a permitted maximum disposal of 74,554 tons per day. In comparison, the proposed project would increase solid waste disposal by 306 pounds per day.³ This represents a small fraction of the maximum disposal of the landfills serving the project site. In addition, the City of Lawndale has averaged a 40 percent diversion rate from 1995 to present. Therefore, impacts would be less than significant.
- g) **No Impact.** Solid waste management is guided by the California Integrated Waste Management Act of 1989 that emphasizes resource conservation through reduction, reuse, and recycling of solid waste. All local, State, and federal guidelines regarding solid waste will be complied with during project construction and operation, including Assembly Bill 1327, which requires that adequate areas for collecting and loading recyclable materials be provided. No impact would occur.

Mitigation Measures: No mitigation measures will be required.

³ California Department of Resources Recycling and Recovery.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Comments:

- a) **Less-Than-Significant Impact.** The preceding analyses conclude that no significant unmitigated impacts to the environment will occur. The project site is primarily vacant. The project site contains minimal landscaping and does not likely support sensitive species. The proposed project does not have the potential to substantially reduce the habitat of a fish species, cause a fish population to drop below self-sustaining levels, eliminate a plant or fish community, or reduce the number or restrict the range of a rare or endangered plant. No historic resources are located on or adjacent to the project site.
- b) **Less-Than-Significant Impact.** A significant impact may occur if the proposed project, in conjunction with related projects, would result in impacts that are less than significant when viewed separately but significant when viewed together. Although related projects may be constructed in the project vicinity, the cumulative impacts to which the proposed project would contribute would be less than significant, as all potential impacts of the proposed project would be reduced to less-than-significant levels with implementation of the mitigation measures provided in the previous sections. None of these potential impacts are considered cumulatively considerable, and implementation of the mitigation measures identified in this Mitigated Negative Declaration will ensure that no cumulative impacts will occur as a result of the proposed project.
- c) **No Impact.** A significant impact may occur if the proposed project has the potential to result in significant impacts, as discussed in the preceding sections. All potential impacts of the proposed project have been identified, and mitigation measures have been prescribed, where applicable, to reduce all potential impacts to less-than-significant levels. Upon implementation of mitigation measures, the proposed project would not have the potential to result in substantial adverse impacts on human beings either directly or indirectly.

Mitigation Measures: No mitigation measures will be required.

EARLIER ANALYSES

Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, one or more effects have been adequately analyzed in an earlier FEIR or Negative Declaration (Section 15063(c)(3)(D)).

Earlier analyses used:

- 1) City of Lawndale General Plan Final EIR/Master Environmental Assessment, 1991
- 2) City of Lawndale General Plan, 1992
- 3) Hawthorne Boulevard Specific Plan Final EIR
- 4) Hawthorne Boulevard Specific Plan
- 5) City of Lawndale Zoning Code, as amended
- 6) Grevillea Mixed-Use Project Final Mitigated Negative Declaration, 2011

All documents listed above are on file and may be reviewed at:

City of Lawndale
Community Development Department
14717 Burin Avenue
Lawndale, CA 90260
(310) 973-3230

GREVILLEA GARDENS TRAFFIC IMPACT ANALYSIS



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August 12, 2015



Ruth Smith, TE, PTP
Project Manager

8/12/2015
Date



TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
Study Area Intersections	1
Cumulative Projects.....	1
Analysis Scenarios	3
Traffic Analysis Methodologies	3
Determination of Traffic Impacts Requiring Mitigation	4
Congestion Management Plan Analysis	4
II. EXISTING CONDITIONS (2015).....	5
Existing Roadway Conditions	5
Existing Conditions Intersection Analysis	5
III. PROPOSED PROJECT	10
Project Description	10
Project Trip Generation	10
Project Trip Distribution and Assignment.....	10
IV. REGIONAL GROWTH AND CUMULATIVE PROJECTS.....	15
Regional Growth.....	15
Related Projects	15
V. EXISTING PLUS PROJECT CONDITIONS (2015) ANALYSES	19
Existing Plus Project Conditions Intersection Analysis	19
Existing Plus Project Conditions Significant Impacts Analysis.....	19
VI. PROJECT OPENING YEAR CONDITIONS (2017) ANALYSES.....	21
Pre-Project With Ambient Growth Intersection Analysis	21
Opening Year With Project Intersection Analysis	21
Opening Year With Project Plus Related Projects Intersection Analysis	21
Opening Year Significant Impacts Analysis	25
VII. CONCLUSIONS.....	26

TABLE OF CONTENTS (cont.)

<u>LIST OF TABLES</u>		<u>Page</u>
<u>Table</u>	<u>Description</u>	
1	Level of Service Analysis Summary	9
2	Project Trip Generation	12
3	Cumulative Projects Trip Generation	17

LIST OF EXHIBITS

<u>Exhibit</u>	<u>Description</u>	
1	Vicinity Map.....	2
2	Existing Intersection Geometry and Traffic Controls	7
3	Existing (2015) AM/PM Peak Hour Volumes.....	8
4	Site Plan.....	11
5	Project Directional Distribution	13
6	Proposed Project AM/PM Peak Hour Volumes	14
7	Related Projects Map.....	16
8	Related Projects (Cumulative) AM/PM Peak Hour Volumes	18
9	Existing Plus Project (2015) AM/PM Peak Hour Volumes	20
10	Opening Year (2017) Pre-Project AM/PM Peak Hour Traffic Volumes ..	22
11	Opening Year (2017) With Project AM/PM Peak Hour Traffic Volumes .	23
12	Opening Year (2017) With Project Plus Cumulative Development AM/PM Peak Hour Traffic Volumes	24

APPENDICES

- Appendix A – Explanation of Intersection Capacity Utilization (ICU) and Level of Service
- Appendix B – 2000 *Highway Capacity Manual* (HCM) Explanation of Level of Service
- Appendix C – Existing Traffic Count Data
- Appendix D – Intersection Analysis Worksheets

Grevillea Gardens Traffic Impact Analysis City of Lawndale

I. INTRODUCTION

This report, prepared by Willdan Engineering, provides a summary of the traffic impact analysis (TIA) for the proposed Grevillea Gardens condominium development. The proposed development consists of 28 condominiums and is located south of 153rd Street and east of Grevillea Avenue, in the City of Lawndale (see **Exhibit 1**).

Study Area Intersections

The analysis includes the seven study intersections listed below and depicted on **Exhibit 1**. Two of the intersections are currently signalized.

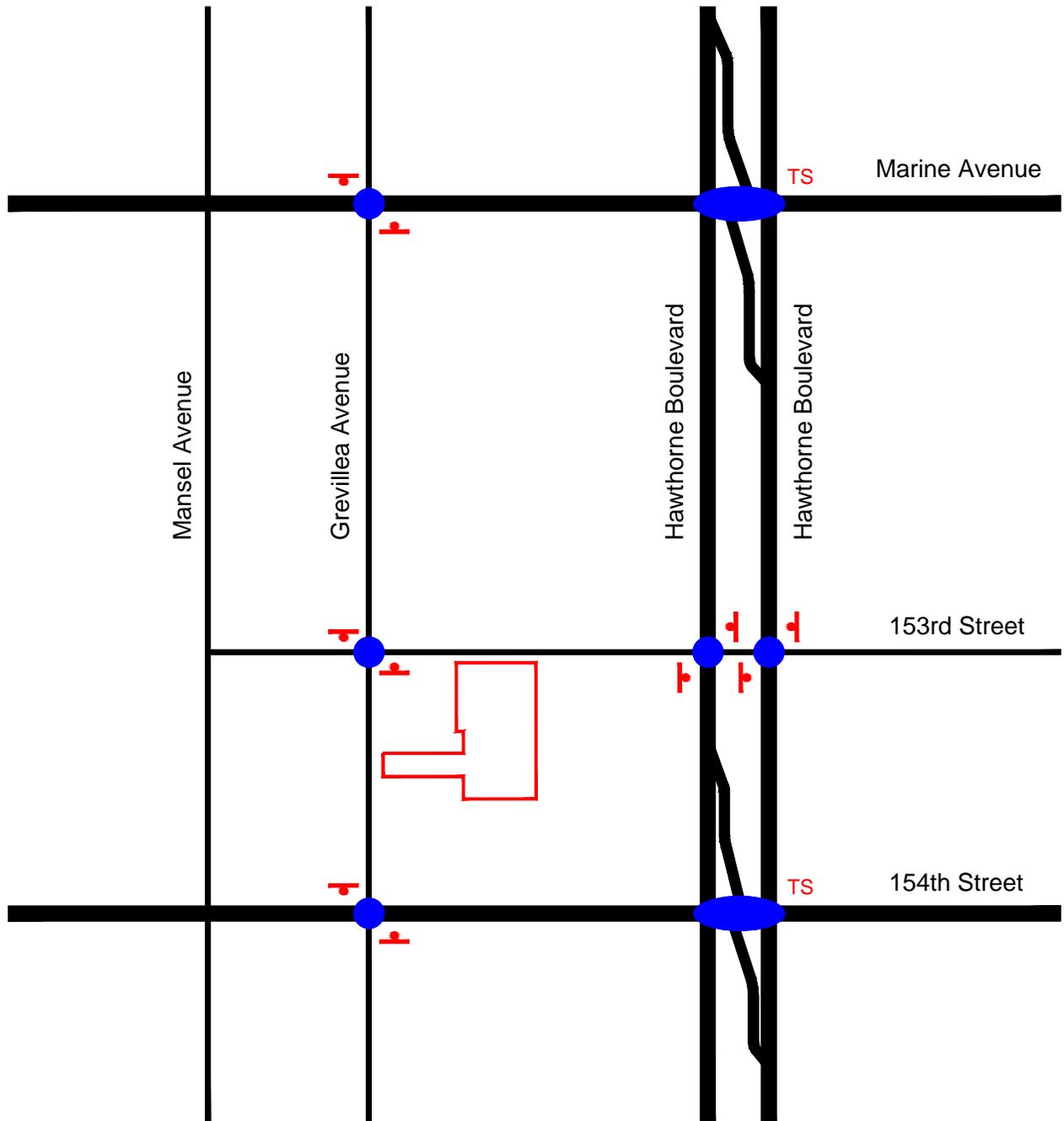
1. Grevillea Avenue / Marine Avenue
2. Grevillea Avenue / 153rd Street
3. Hawthorne Boulevard (Southbound) / 153rd Street
4. Hawthorne Boulevard (Northbound) / 153rd Street
5. Grevillea Avenue / 154th Street
6. Hawthorne Boulevard / 154th Street
7. Hawthorne Boulevard / Marine Avenue (signalized)
8. Hawthorne Boulevard/Marine Avenue (signalized)

Cumulative Projects

Due to the project's location, the cities of Torrance, Redondo Beach, and Hawthorne were contacted regarding projects within these cities that would be likely to contribute traffic to the study intersections. Information provided by these agencies and the City of Lawndale formed the basis of the cumulative projects list.



No Scale



Legend:

-  = Study Intersection
-  = Traffic Signal
-  = Stop Sign
-  = Project Site

Vicinity Map
Exhibit 1

Analysis Scenarios

To evaluate the project's potential traffic impacts on the study intersections, the following five scenarios were analyzed:

- Existing (2015) Conditions
- Existing plus Project (2015) Conditions
- Pre-Project With Ambient Growth (2017) Conditions
- Opening Year With Project (2017) Conditions
- Opening Year With Project Plus Cumulative Projects (2017) Conditions

Traffic Analysis Methodologies

The Intersection Capacity Utilization (ICU) methodology was used to analyze the Level of Service (LOS) for signalized intersections and the 2000 *Highway Capacity Manual* (HCM) methodology was used to analyze unsignalized intersections.

For signalized intersections, an ICU value is calculated based upon a comparison of peak hour intersection volumes to available roadway capacity for the critical intersection movements. The ICU values are then related to Levels of Service (LOS), which are qualitative descriptions of intersection operations and can range from "A" (the best level) to "F" (the worst). The City of Lawndale generally considers LOS A through C to represent acceptable intersection operations, while LOS D, E and F indicate a congested (unacceptable) situation. A more detailed explanation of ICU and its relationship to LOS is contained in **Appendix A**.

The 2000 *Highway Capacity Manual* (HCM) methodology was utilized to analyze the unsignalized intersections. For both of these intersection analysis methods, the operating conditions are defined in terms of Levels of Service (LOS). The Levels of Service are described using letter "grades", which for the HCM methodology are associated with vehicle delay times (in seconds), where "A" is considered the best and "F" is over capacity. As with the ICU methodology, the City of Lawndale generally

considers LOS A through C to represent acceptable intersection operations, while LOS D, E and F indicate a congested (unacceptable) situation. An explanation of Level of Service as it relates to vehicle delay for the 2000 HCM analysis is provided in ***Appendix B.***

Determination of Traffic Impacts Requiring Mitigation

The following criteria were used to determine if the project would have any traffic impacts on the study intersections, requiring project-related mitigation measures:

Signalized Intersections

- A change in Level of Service (LOS) from C to D or D to E is a traffic impact and mitigation measures are needed.
- Within LOS C or D, a change in ICU value greater than 0.02 is an impact and within LOS E or F a change in ICU greater than 0.01 is an impact.

Unsignalized Intersections

- When the addition of project traffic increases the Level of Service to an unacceptable level (less than LOS C) mitigation measures are required.

The traffic analysis found that the project would not have traffic impacts on any of the study intersections and no project-related mitigation measures are required.

Congestion Management Plan Analysis

None of the study intersections are recognized by the County of Los Angeles as being Congestion Management Plan (CMP) intersections. Consequently, the study did not include a CMP analysis.

II. EXISTING CONDITIONS (2015)

Existing Roadway Conditions

Vehicular circulation to and from the project site is provided by the street system described in the following paragraphs:

Hawthorne Boulevard is identified in the City's General Plan Circulation Element as a major highway within the City boundaries. This broad north-south roadway traverses the entire City and provides three lanes of traffic in each direction. In the project vicinity, opposing lanes of traffic are separated by a raised median and parking. Dedicated left turn lanes are provided at the intersections. The posted speed limit is 35 mph on Hawthorne Boulevard in the City of Lawndale.

Grevillea Avenue is a north-south local street with one lane of traffic in each direction and parking on both sides. The prima facie speed limit on Grevillea Avenue is 25 mph.

153rd Street is a local street traversing the City in an east-west direction. This roadway provides one lane of travel in each direction, with parking on both sides. 153rd Street has a prima facie speed limit of 25 mph.

154th Street is a collector street traversing the City in an east-west direction. This roadway provides one lane of traffic in each direction in the project vicinity. The prima facie speed limit is 25 mph.

Marine Avenue is a major highway, traversing the City in an east-west direction. Marine Avenue provides three lanes of traffic in each direction, separated by a double yellow line. On-street parking is allowed except at intersections where dedicated left turn lanes are provided. The posted speed limit on Marine Avenue in the City of Lawndale is 40 mph.

Existing Conditions (2015) Intersection Analysis

Since intersection operations typically define roadway conditions, operating conditions at the seven study area intersections were analyzed during the AM and PM peak hours.

In order to evaluate current traffic operations in the study area, a field review of the study area intersections was performed and intersection turning movement traffic counts were collected. **Exhibit 2** presents the existing roadway configurations, intersection geometrics, and intersection controls in the project study area, which were observed in the field review.

Traffic counts were performed by *Counts Unlimited, Inc.* in June 2015, while school was still in session. The Existing AM and PM peak hour traffic volumes are shown on **Exhibit 3**. The 2015 AM and PM peak hour count data is included in **Appendix C**.

The operating conditions at the study intersections were evaluated utilizing the Intersection Capacity Utilization (ICU) and 2000 Highway Capacity Manual (HCM) methodologies described in **Section I**. **Table 1** summarizes the results of the intersection analyses for Existing conditions.

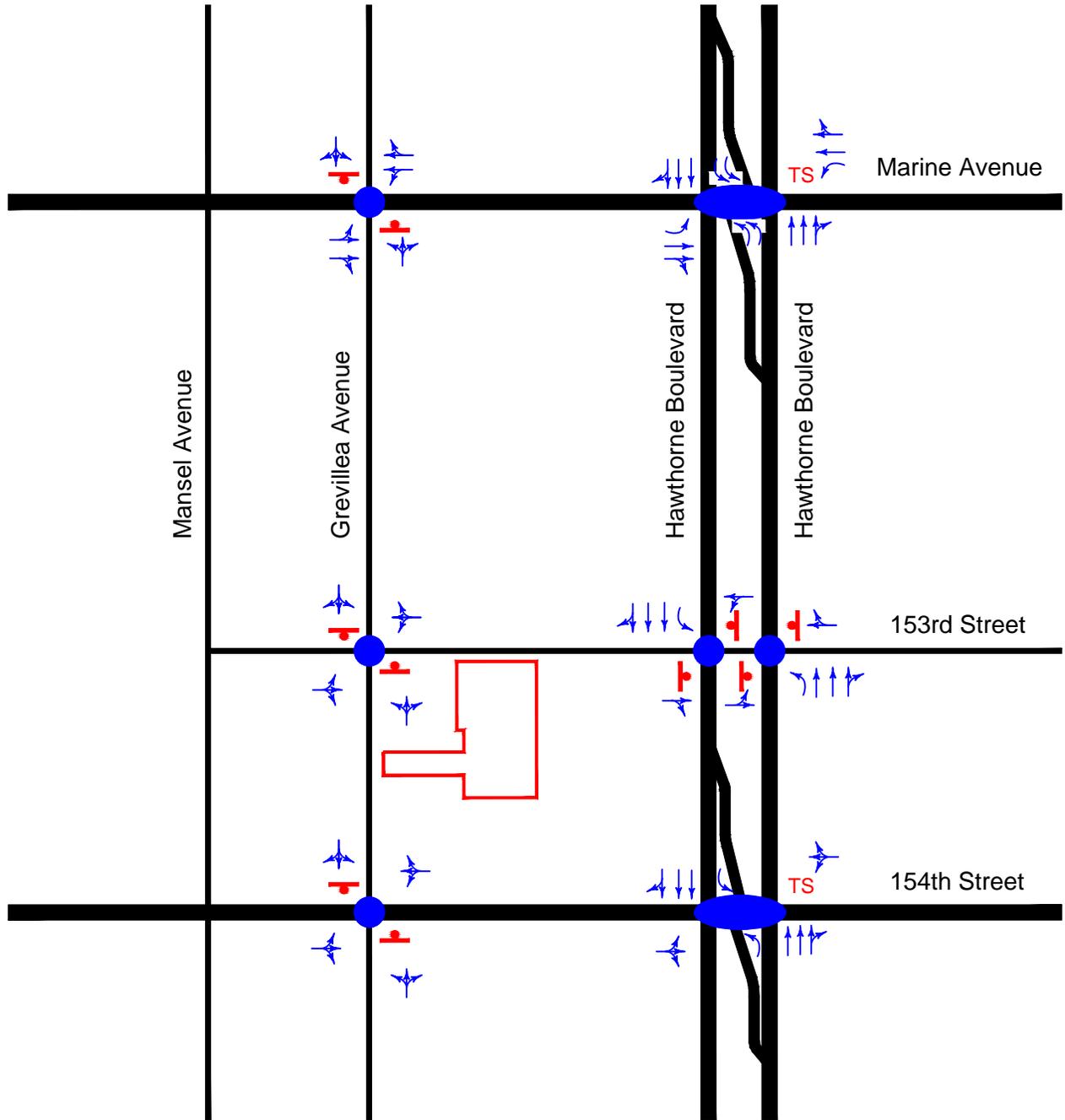
Of the seven intersections analyzed under Existing conditions, five are currently operating at LOS C or better. The following two are operating at LOS D or E during at least one of the peak periods:

- Grevillea Avenue / Marine Avenue
- Hawthorne Boulevard / Marine Avenue

The supporting ICU and HCM intersection analyses worksheets can be referenced in **Appendix D**.



No Scale



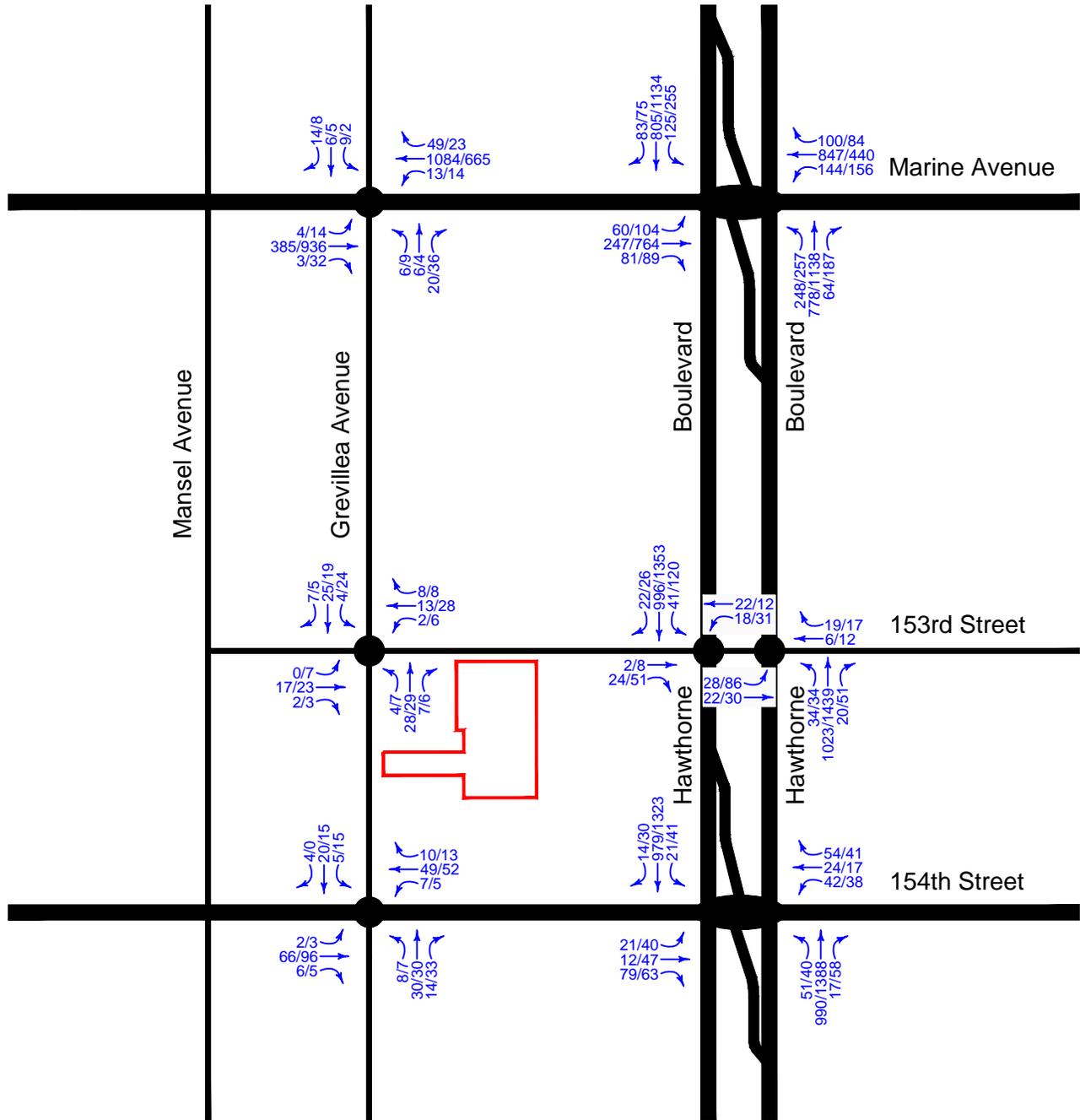
Legend:

-  = Study Intersection
-  = Traffic Signal
-  = Stop Sign
-  = Project Site

Existing Intersection Geometry & Traffic Controls
 Exhibit 2



No Scale



Legend:

- 66/96 → = AM/PM Peak Hour Volumes
- ▭ = Project Site
- = Study Intersection

Existing (2015)
 AM/PM Peak Hour Volumes
 Exhibit 3

TABLE 1

SUMMARY OF INTERSECTION LEVEL OF SERVICE ANALYSIS & SIGNIFICANT IMPACT ANALYSIS

Intersection	Peak Hour	Existing (2015)		Existing Plus Project (2015)		Project Impact Under Existing Conditions ¹		Pre-Project W/ Ambient Growth (2017)		Opening Year With Project (2017)		Project Impact at Opening Year ²		Opening Year W/ Project Plus Cumul Projects (2017) ³		Cumulative Impact ³	
		ICU or Delay	LOS	ICU or Delay	LOS	Change in in LOS/ICU	Significant Impact? ⁴	ICU or Delay	LOS	ICU or Delay	LOS	Change in in LOS/ICU	Significant Impact? ⁴	ICU or Delay	LOS	Change in in LOS/ICU	Significant Impact? ⁴
<i>Unsignalized Intersections (HCM)⁴</i>																	
Grevillea Ave/ Marine Ave	AM	38.6	E	38.6	E	None	NO	39.6	E	39.6	E	None	NO	39.6	E	None	NO
	PM	34.1	D	34.3	D	None	NO	35.0	E	35.0	E	None	NO	35.0	E	None	NO
Grevillea Ave/ 153rd St	AM	9.3	A	9.3	A	None	NO	9.3	A	9.3	A	None	NO	9.3	A	None	NO
	PM	9.6	A	9.7	A	None	NO	9.7	A	9.7	A	None	NO	9.7	A	None	NO
Hawthorne Blvd SB/ 153rd St	AM	14.5	B	14.6	B	None	NO	14.6	B	14.7	B	None	NO	14.7	B	None	NO
	PM	19.9	C	20.1	C	None	NO	20.2	C	20.4	C	None	NO	20.4	C	None	NO
Hawthorne Blvd NB/ 153rd St	AM	14.7	B	14.7	B	None	NO	14.7	B	14.7	B	None	NO	14.7	B	None	NO
	PM	19.6	C	19.7	C	None	NO	19.8	C	19.9	C	None	NO	20.0	C	None	NO
Grevillea Ave/ 154th St	AM	7.6	A	7.6	A	None	NO	7.6	A	7.6	A	None	NO	7.6	A	None	NO
	PM	7.9	A	7.9	A	None	NO	7.9	A	7.9	A	None	NO	7.9	A	None	NO
<i>Signalized Intersections (ICU)⁴</i>																	
Hawthorne Blvd/ 154th St	AM	0.414	A	0.415	A	0.001	NO	0.417	A	0.418	A	0.001	NO	0.419	A	0.002	NO
	PM	0.521	A	0.522	A	0.001	NO	0.524	A	0.525	A	0.001	NO	0.526	A	0.002	NO
Hawthorne Blvd/ Marine Ave	AM	0.705	C	0.705	C	0.000	NO	0.711	C	0.711	C	0.000	NO	0.712	C	0.001	NO
	PM	0.829	D	0.829	D	0.000	NO	0.836	D	0.836	D	0.000	NO	0.837	D	0.001	NO

¹ Project Impact With Existing Conditions = Impact of project traffic volumes, compared to baseline conditions (existing traffic volumes and existing intersection geometry).
² Project Impact at Opening Year = Impact of project traffic volumes, compared to baseline conditions (ambient growth added to existing traffic volumes).
³ Cumulative Impact = Combined impact of project and related projects traffic volumes, compared to baseline conditions (ambient growth added to existing traffic volumes).
⁴ The LOS analysis for unsignalized intersections is based on the HCM delay methodology and the LOS analysis for signalized intersections is based on the HCM methodology
⁵ The determination of a significant impact is based on the City's thresholds listed below.

Traffic Impact Thresholds

The project has a traffic impact on a signalized intersection, which must be mitigated, under the following conditions:

- There is a change in LOS from C to D or from D to E
- Within LOS C or D, an increase in ICU value greater than 0.02
- Within LOS E or F, an increase in ICU value greater than 0.01

The project has a traffic impact on an unsignalized intersection, which must be mitigated, under the following conditions:

- The addition of project traffic increases the LOS to an unacceptable level (to LOS D, LOS E or LOS F).

III. PROPOSED PROJECT

Project Description

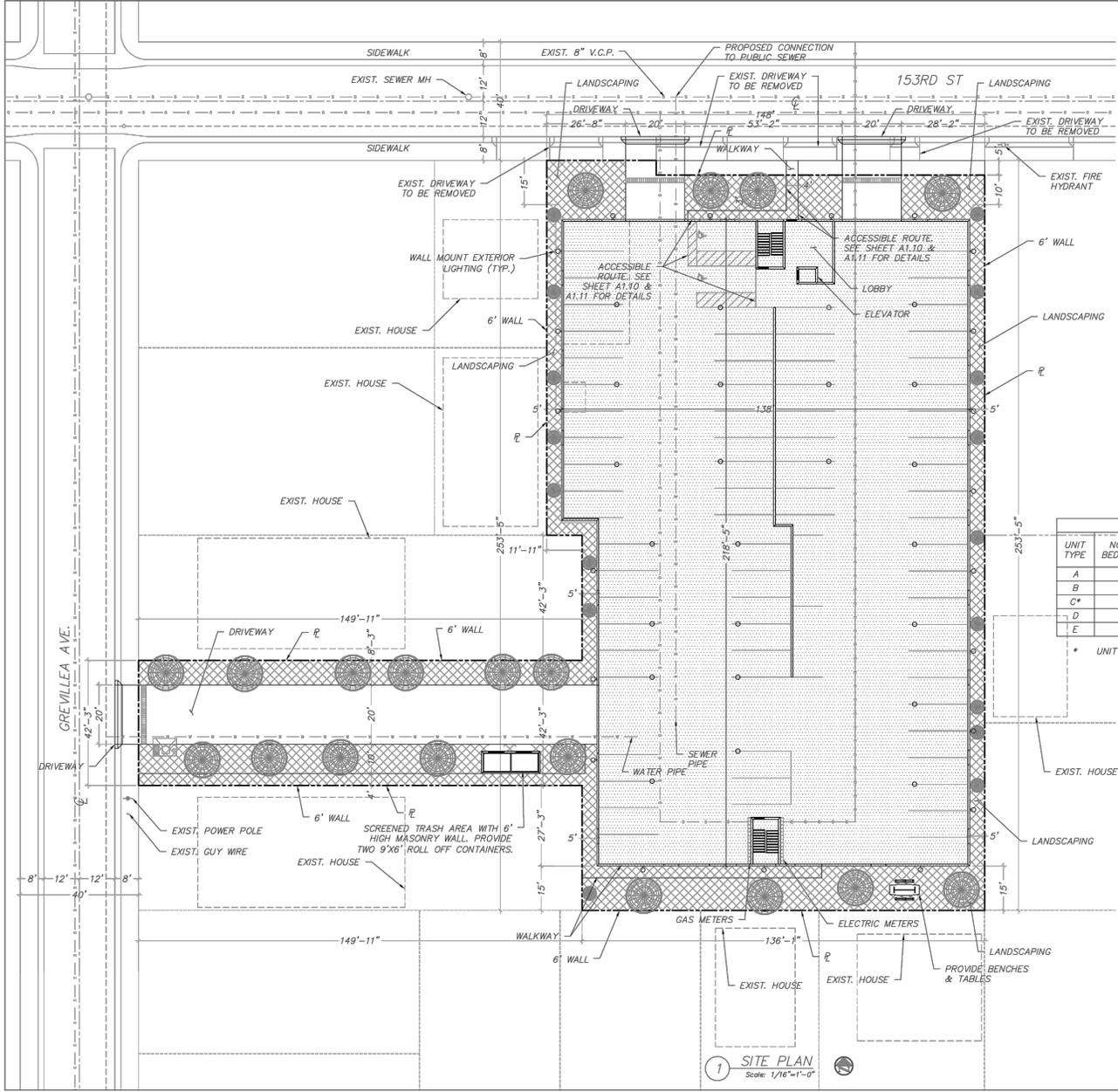
The proposed Grevillea Gardens condominium development consists of 28 single family condominiums, located south of 153rd Street and east of Grevillea Avenue, in the City of Lawndale. The main access to the site is on 153rd Street, with a secondary access provided on Grevillea Avenue. The site is currently vacant. The project location in relationship to the surrounding street system is shown on previous **Exhibit 1**. The proposed site plan is illustrated on **Exhibit 4**.

Project Trip Generation

The Institute of Transportation Engineers *Trip Generation Manual* is the standard reference for determining the number of trips a given land use would be expected to generate. The trip generation rates for the proposed land use are shown in **Table 2**. The project is expected to generate 163 daily trips, 12 AM peak hour trips and 15 PM peak hour trips.

Project Trip Distribution and Assignment

The proposed project trips are expected to be distributed onto the study area roadways as shown on **Exhibit 5**. **Exhibit 6** illustrates the project trips assigned to each study intersection, based on the project's trip generation and distribution.



SITE SUMMARY:
 ZONE: R3
 POR. LOT 12: 15318 GREVILLEA AVE, LAWDALE, CA 90260, ASSESSOR'S ID NUMBER 4079-016-011. AREA: 6,336 SF
 POR. LOT 14: 4440 W 153RD ST., LAWDALE, CA 90260, ASSESSOR'S ID NUMBER 4079-016-021. AREA: 4,869 SF
 LOT 1: 4430 W 153RD ST., LAWDALE, CA 90260, ASSESSOR'S ID NUMBER 4079-016-027. AREA: 32,166 SF
 TOTAL LOT GROSS AREA: 6,336+4,869+32,166=43,371 SF

LEGAL DESCRIPTION:
 BEING A SUBDIVISION OF A PORTION OF LOTS 11, 12, 13 AND 14, BLOCK 58, LAWDALE ACRES, AS SHOWN ON MAP RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY.

BASIS OF BEARING:
 THE BEARINGS SHOWN HEREON ARE BASED ON THE BEARING N89°56'00"W OF THE CENTERLINE OF 154TH STREET, FORMERLY VIRGINIA AVENUE, AS SHOWN ON LAWDALE ACRES, M.B. 17, PG. 73, RECORDS OF LOS ANGELES COUNTY, CALIFORNIA.

SITE PLAN SUMMARY:

- GROSS FLOOR AREA:
- SECOND FLOOR: 29,778 SF
- THIRD FLOOR: 29,778 SF
- TOTAL FLOOR AREA: 59,556 SF
- NUMBER OF PARKING SPACES:
- PROVIDED: 70 (2 ACCESSIBLE)
- PARKING SPACES REQUIRED - 2 PER DWELLING UNIT: 56
- GUEST PARKING PROVIDED - 14
- GUEST PARKING REQUIRED - 1/2 SPACE PER DWELLING UNIT: 14
- LOT COVERAGE: 29,778 SF (70%)
- MAXIMUM BUILDING HEIGHT: 35'
- COMMON OPEN SPACE: 8,301 SF (MIN. 200 SF PER UNIT)

- NO EASEMENTS ON THE PROPERTY.
- ALL UTILITIES SHALL BE PLACED UNDERGROUND.

LEGEND:

- BUILDING LIMITS
- COMMON OPEN SPACE TOTAL AREA=8,939 SF

UNITS SUMMARY						
UNIT TYPE	NO. OF BEDROOMS	NO. OF BATHROOMS	OPEN SPACE AREA (SF)	STORAGE SPACE (CF)	TOTAL FLOOR AREA (SF)	TOTAL NO. OF UNITS PER FLOOR
A	3	2	203	369	1713	7
B	3	2	203	369	1645	1
C*	3	2	203	369	1713	2
D	3	2	224	270	1566	1
E	2	2	200	225	1495	3

* UNIT TYPE C IS ACCESSIBLE

1 SITE PLAN
 Scale: 1/16"=1'-0"

SPR 14-10

GREVILLEA GARDENS
 28 SINGLE FAMILY
 CONDOMINIUMS

OWNER:
 ALI AWAD
 221 AVENUE B
 REDONDO BCH, CA
 90277

ARCHITECT/ENGINEER:
 COOKE & ASSOCIATES
 3850 W IMPERIAL HWY.
 INGLEWOOD, CA 90303
 (310) 722-2707
 (310) 679-1776 FAX

PROJECT ADDRESS:
 4428 & 4438 153RD
 STREET
 LAWDALE, CA90260

PROJECT NO.
 2013-4

CHECKED
 CC

DRAWN
 BP

DATE
 6/7/14

TITLE
 SITE PLAN

SHEET
 A1.1

Project Site Plan Exhibit 4



TABLE 2

Project Trip Generation

Trip Generation Rates¹

LAND USE	ITE CODE	UNIT ²	DAILY RATE	AM PEAK HOUR RATES			PM PEAK HOUR RATES		
				In	Out	Total	In	Out	Total
Residential Condominium/ Townhouse	230	DU	5.81	0.07 [17%]	0.37 [83%]	0.44	0.35 [67%]	0.17 [33%]	0.52

Project Trip Generation

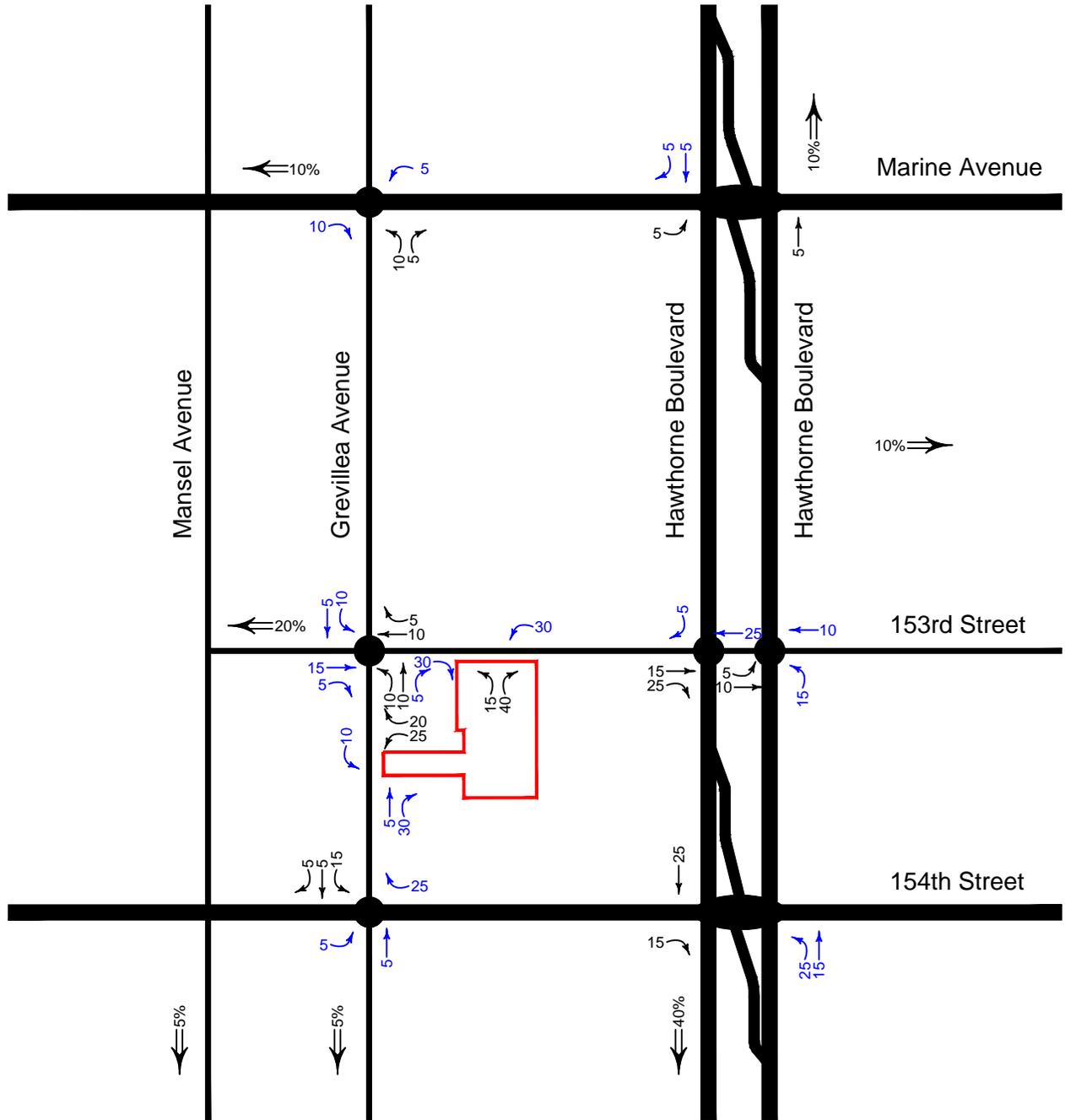
LAND USE	ITE CODE	QUAN-TITY ²	DAILY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				In	Out	Total	In	Out	Total
Residential Condominium/ Townhouse	230	28 DU	163	2	10	12	10	5	15

¹ Source: Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition, 2012

² DU = Dwelling Units



No Scale



Source = Traffic Impact Analysis for the Grevillea Mixed Used Project in the City of Lawndale, Cordoba Corporation, 2010.

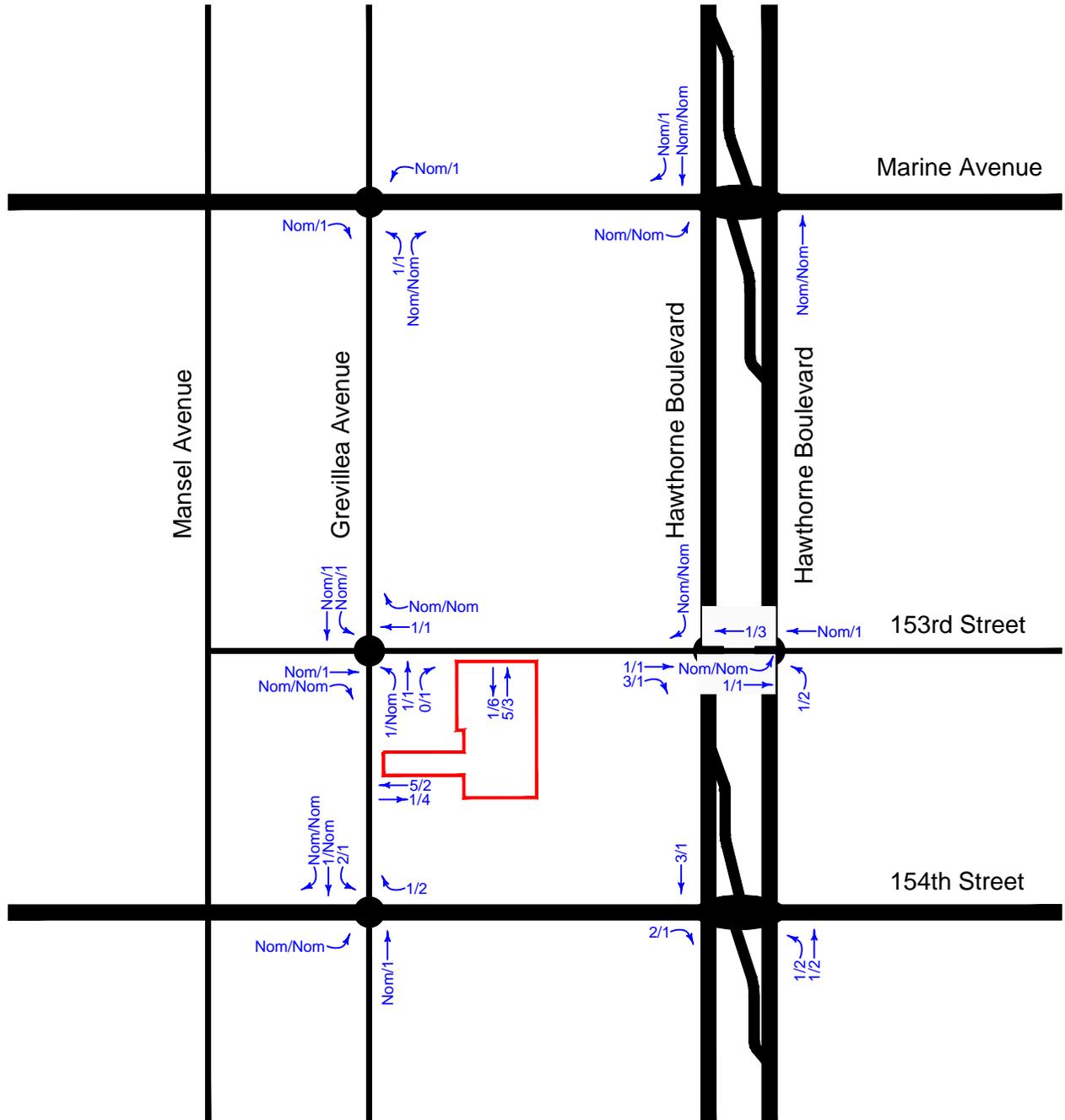
Legend:

- 15% → = Regional Trip Distribution
- 10 → = % Outbound
- 5 → = % Inbound
- ▭ = Project Site
- = Study Intersection

Project Directional Distribution Exhibit 5



No Scale



Legend:

- 1/3 → = AM/PM Peak Hour Volumes
- Nom = Nominal, Less than 1 Trip
- = Project Site
- = Study Intersection

Proposed Project
AM/PM Peak Hour Volumes
Exhibit 6

IV. REGIONAL GROWTH AND RELATED PROJECTS

Regional Growth

To properly assess the project's future impact, regional or ambient growth was included in the analysis and applied to the existing traffic volumes. A growth rate of 0.50 percent per year was used, based on the growth rates provided in the Metropolitan Transportation Authority's (MTA's) Congestion Management Program. When expanded out to the analysis year of 2017, a total regional growth factor of 1.10 was applied to the existing 2015 traffic counts.

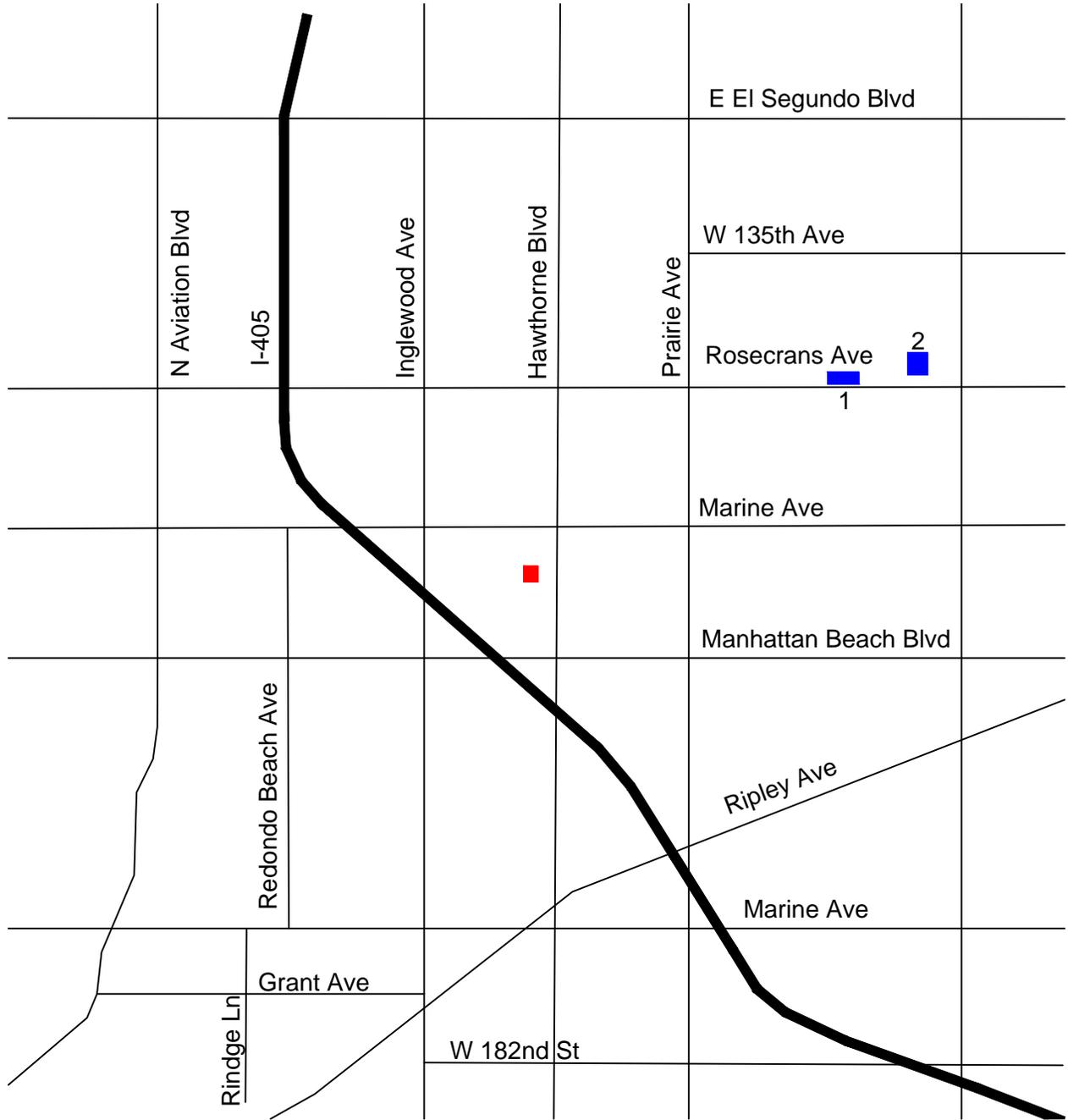
Related Projects

The City of Lawndale and the surrounding cities of Hawthorne, Redondo Beach, and Torrance were contacted regarding Related Projects in their jurisdictions. Related Projects include projects that are pending, approved and/or under construction, that are within a 2-mile radius of the project site. **Exhibit 7** lists the two applicable related projects used in the analysis and shows their locations. Both related projects are located in the City of Hawthorne.

Table 3 includes the applicable ITE trip generation rates for the related projects, a description of each related project, and the trips anticipated to be generated by each of the related projects. The AM and PM peak hour trips that would be generated by the related projects are illustrated on **Exhibit 8**.



No Scale



Legend:

- = Project Site
- = Related Project

Related Project 1: 127 units of portable housing
 Related Project 2: 109 units of moderate income housing

Related Projects Map
 Exhibit 7

TABLE 3
RELATED PROJECTS TRIP GENERATION

Trip Generation Rates¹

LAND USE	ITE CODE	UNIT ²	DAILY RATE	AM PEAK HOUR RATES			PM PEAK HOUR RATES		
				In	Out	Total	In	Out	Total
Apartment	220	DU	6.65	0.10 [20%]	0.41 [80%]	0.51	0.40 [65%]	0.22 [35%]	0.62
Mobile Homes	240	DU	4.99	0.09 [20%]	0.35 [80%]	0.44	0.37 [62%]	0.22 [38%]	0.59

¹ Source: Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition, 2012

² TSF = Thousand Square Feet, DU = Dwelling Unit

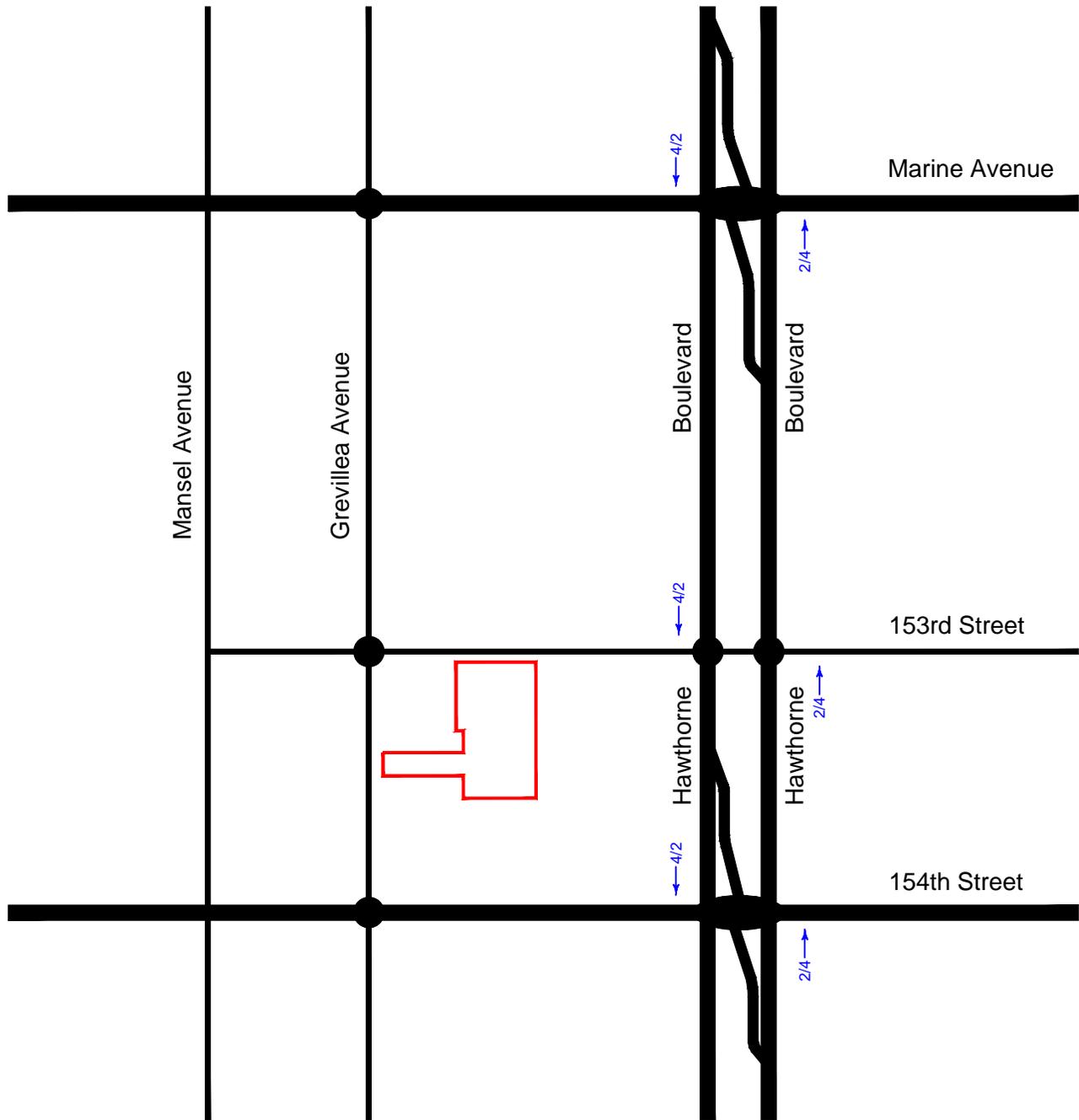
Related Projects Trip Generation¹

RP NO. ² & LAND USE	ITE CODE	QUAN-TITY ³	DAILY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				In	Out	Total	In	Out	Total
1. Moderate Income Housing 14105-14317 Chadron Avenue Hawthorne, CA	220	109 DU	725	11	45	56	44	24	68
2. Portable Housing Units 14134 Yucon Avenue Hawthorne, CA	240	127 DU	845	13	52	65	51	28	79
Total			1,570	24	97	121	95	52	147

¹ Related Projects are those within a 2-mile radius of the project site.

² Related Project Number - corresponds to the numbers on Exhibit 7.

³ TSF = Thousand Square Feet, DU = Dwelling Units



Legend:

- 2/4 → = AM/PM Peak Hour Volumes
- ▭ = Project Site
- = Study Intersection

**Related Projects (Cumulative)
AM/PM Peak Hour Traffic Volumes
Exhibit 8**

V. EXISTING PLUS PROJECT CONDITIONS (2015) ANALYSES

Existing Plus Project Conditions Level of Service Analysis

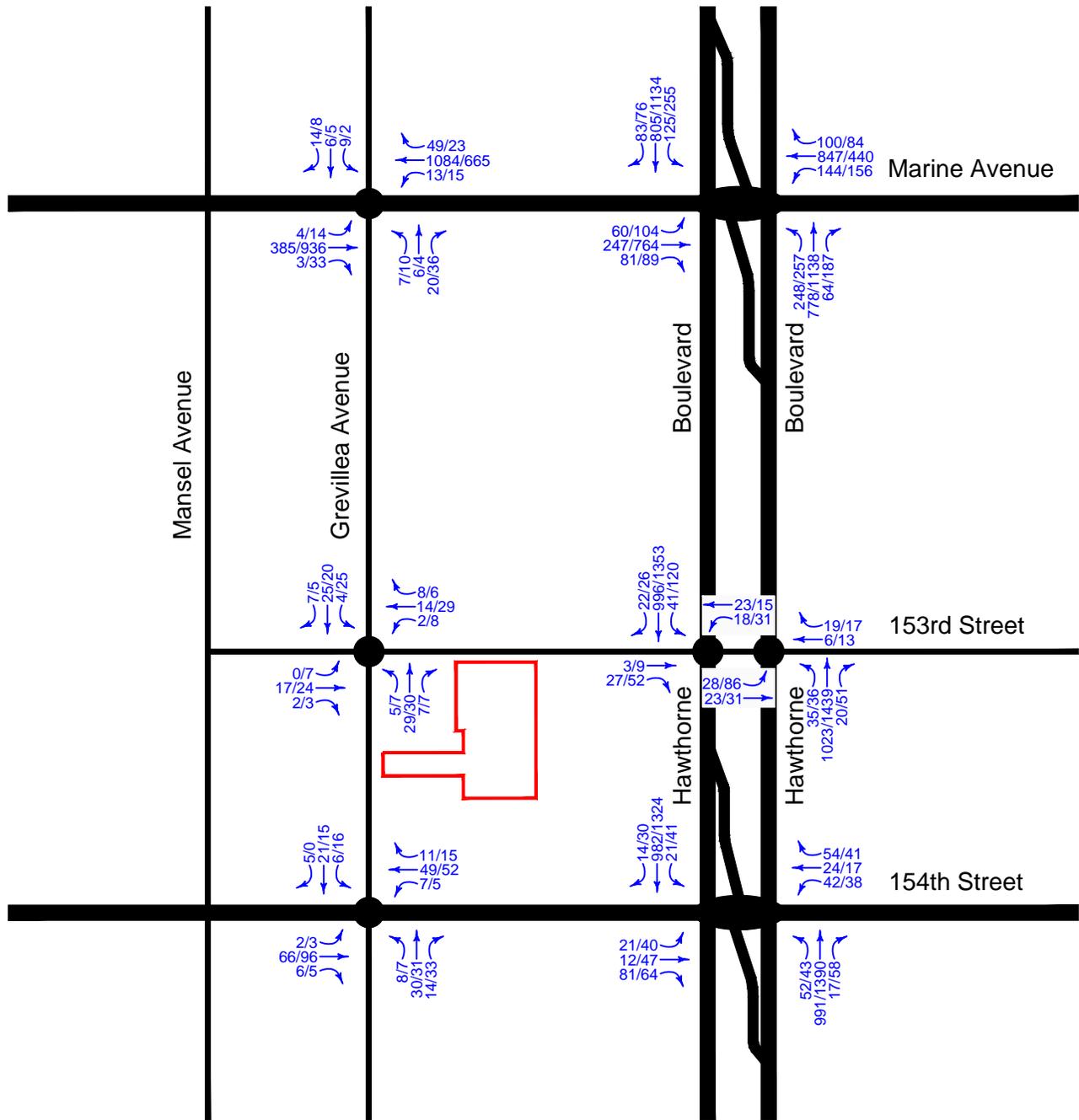
The impact of adding project traffic to existing traffic was assessed. Existing Plus Project AM and PM peak hour traffic volumes are shown on **Exhibit 9**. The resulting levels of service (LOS) at the project study intersections are shown in previous **Table 1**. A review of **Table 1** indicates that the level of service would remain the same as Existing conditions at all of the study intersections with the addition of project trips. The supporting ICU and HCM intersection analyses worksheets can be referenced in **Appendix D**.

Existing Plus Project Conditions Significant Impacts Analysis

Table 1 also compares the LOS/ICU for Existing Plus Project conditions to Existing conditions, to determine if the project would have a direct impact on Existing conditions. **Table 1** indicates that the project would not have a significant traffic impact on the study intersections. There would be no change in LOS at any of the unsignalized intersections and any changes in delay for signalized intersections with the addition of project traffic would be insignificant.



No Scale



Legend:

12/47 → = AM/PM Peak Hour Volumes

□ = Project Site

● = Study Intersection

Existing Plus Project (2015)
AM/PM Peak Hour Volumes
Exhibit 9

VI. PROJECT OPENING YEAR CONDITIONS (2017) ANALYSES

Pre-Project With Ambient Growth Intersection Analysis

Pre-Project With Ambient Growth conditions consist of the sum of the existing traffic volumes plus ambient growth to the project opening year of 2017. The Pre-Project With Ambient Growth AM/PM peak hour traffic volumes are shown on **Exhibit 10**. The results of the analysis are summarized in previous **Table 1**. A review of **Table 1** indicates that the levels of service would remain the same as for Existing conditions at all of the study intersections. The supporting ICU and HCM intersection analyses worksheets can be referenced in **Appendix D**.

Opening Year With Project Intersection Analysis

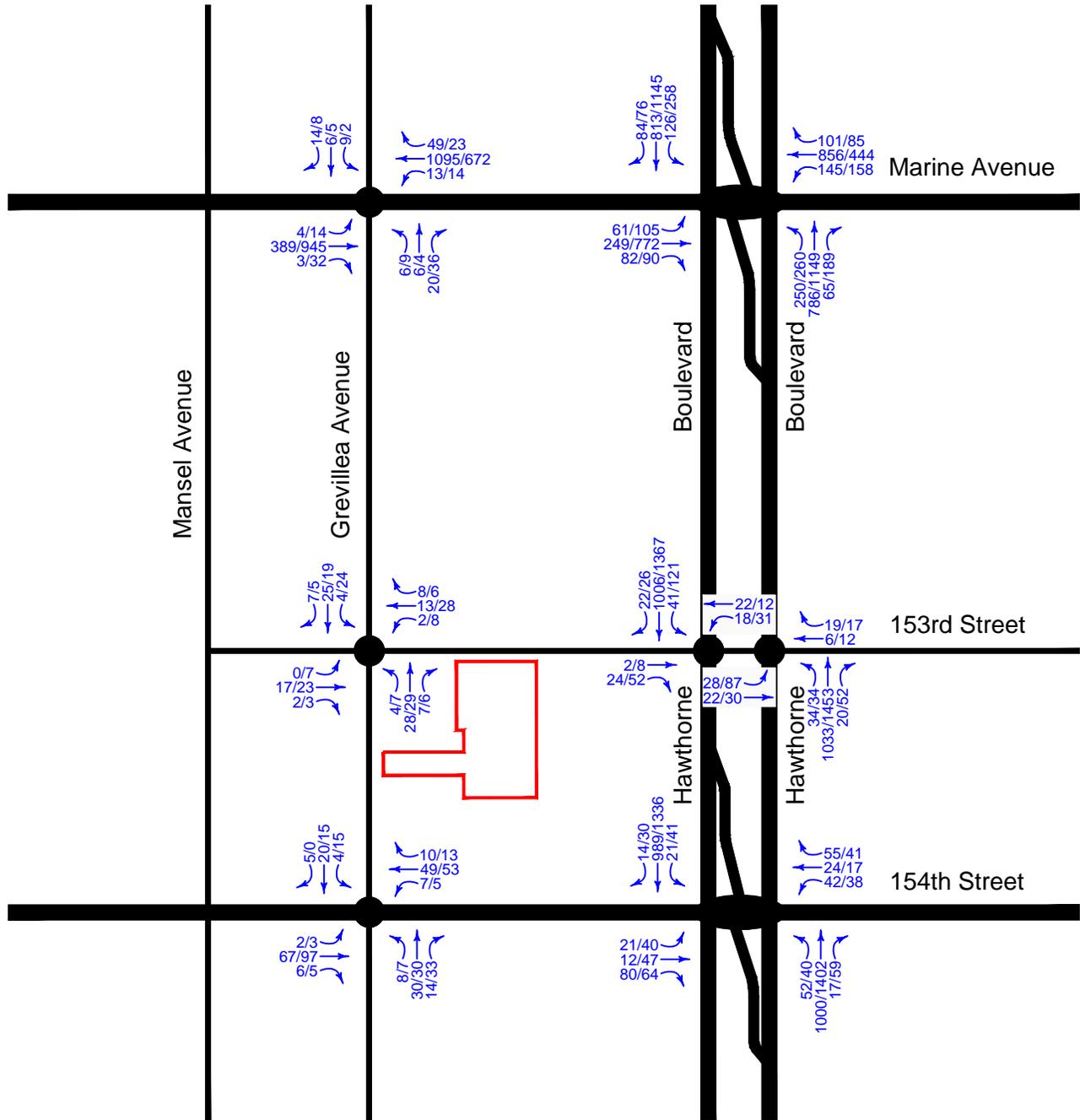
Opening Year With Project conditions consist of the sum of the existing traffic volumes plus regional growth plus project traffic volumes. The Opening Year With Project AM and PM peak hour traffic volumes are shown on **Exhibit 11**. The results of the analysis are summarized in previous **Table 1**. A review of **Table 1** indicates that the levels of service would remain the same as for Pre-Project With Ambient Growth conditions at all of the study intersections. The supporting ICU and HCM intersection analyses worksheets can be referenced in **Appendix D**.

Opening Year With Project Plus Related Projects Intersection Analysis

Opening Year With Project conditions consist of the sum of the existing traffic volumes plus regional growth, project and related project traffic volumes, and represent cumulative conditions. The Opening Year With Project Plus Related Projects AM and PM peak hour traffic volumes are shown on **Exhibit 12**. The results of the analysis are summarized in previous **Table 1**. A review of **Table 1** indicates that the levels of service would remain the same as for Pre-Project With Ambient Growth conditions at all of the study intersections. The supporting ICU and HCM intersection analyses worksheets can be referenced in **Appendix D**.



No Scale



Legend:

66/96 → = AM/PM Peak Hour Volumes

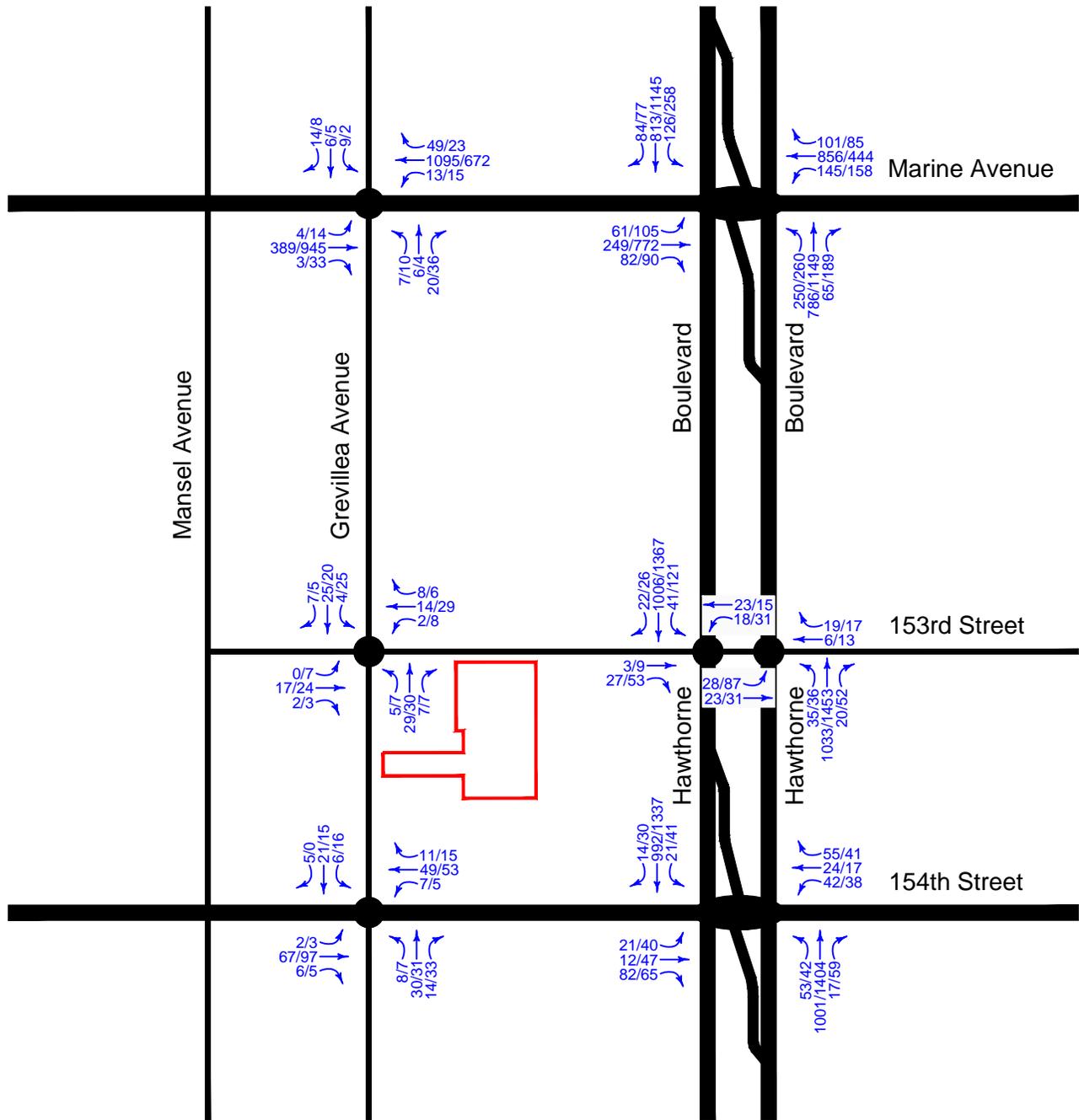
□ = Project Site

● = Study Intersection

Opening Year (2017) Pre-Project AM/PM Peak Hour Traffic Volumes Exhibit 10



No Scale



Legend:

66/96 → = AM/PM Peak Hour Volumes

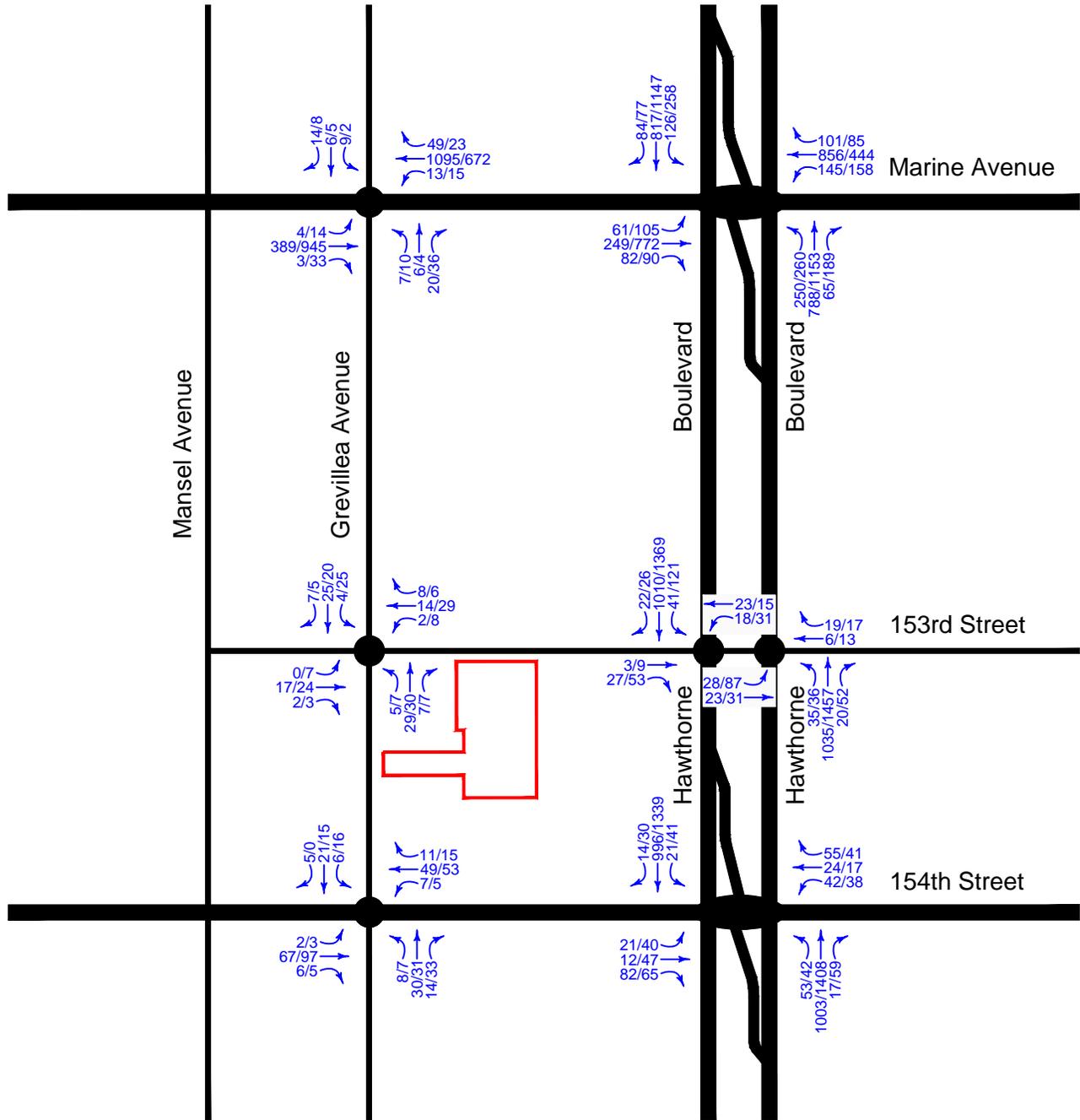
□ = Project Site

● = Study Intersection

Opening Year (2017) With Project
AM/PM Peak Hour Traffic Volumes
Exhibit 11



No Scale



Legend:

66/96 → = AM/PM Peak Hour Volumes

□ = Project Site

● = Study Intersection

Opening Year (2017) With Project Plus Cumulative Development
 AM/PM Peak Hour Traffic Volumes
 Exhibit 12

Opening Year Significant Impacts Analysis

Table 1 compares the level of service (LOS) or ICU for the Opening Year With Project conditions to Pre-Project With Ambient Growth conditions to determine if the addition of project traffic would have a significant project impact on the study intersections. **Table 1** indicates that the project would not have a significant traffic impact on the study intersections. There would be no change in LOS at any of the unsignalized intersections and any changes in delay for signalized intersections with the addition of project traffic would be insignificant.

Table 1 also compares the level of service (LOS) or ICU for the Opening Year With Project Plus Related Project conditions to Pre-Project With Ambient Growth conditions to determine if the addition of project traffic and related project traffic would have a significant cumulative impact on the study intersections. **Table 1** indicates that the project and related projects would not have a significant cumulative traffic impact on the study intersections. There would be no change in LOS at any of the unsignalized intersections and any changes in delay for signalized intersections with the addition of project traffic would be insignificant.

VII. CONCLUSIONS

The level of service and significant traffic impact analyses, as summarized in **Table 1**, clearly show that the proposed project is not anticipated to have any noticeable or significant impacts upon the study intersections. As a result, no mitigation measures are necessary.

APPENDIX A

Explanation of Intersection Capacity Utilization (ICU) and Level of Service

EXPLANATION OF INTERSECTION CAPACITY UTILIZATION (ICU)

The capacity of a street is nearly always greater between intersections and less at intersections. The reason for this is that traffic flows continuously between intersections but only part of the time at intersections. To study intersection capacity, a technique known as Intersection Capacity Utilization (ICU) was developed. An ICU analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement; (b) summing the times needed for the conflicting movements; and (c) comparing the total time required to the total time available. Conflicting movements are those that cannot go at the same time, such as through traffic on one street in the intersection vs. through traffic on the other street forming the intersection. For example, if for north-south traffic the northbound traffic is 1,000 vehicles per hour, the southbound traffic is 800 vehicles per hour, and the capacity of either approach is 2,000 vehicles per hour of green, then northbound traffic is critical and requires $1,000/2000$ or 50 percent of the signal time. If for the east-west traffic, 40 percent of the signal time is required, then it can be seen that the ICU is 50 plus 40, or 90 percent. When left-turn lanes exist, they are incorporated into the analysis. As ICU values approach 100 percent, the quality of traffic flow through an intersection approaches Level of Service (LOS) E, as defined in the *Highway Capacity Manual, Special Report 87*, Highway Research Board, 1965.

“Level of Service” is used to describe the quality of traffic flow. For Levels of Service A through C, an intersection operates well. Level of Service D is typically the Level of Service for which an urban street is designed, having tolerable operating speed. Level of Service E represents the maximum volume of traffic an intersection can accommodate and is the level at which one or more vehicles will have to wait through more than one signal cycle. Level of Service F occurs when an intersection is overloaded, and is characterized by long queues of traffic with stoppages of long duration. A description of the various Levels of Service is on the following page.

The ICU calculations assume that an intersection is signalized and that the signal is ideally timed. It is possible, however, to have an ICU value well below 1.0, yet have severe traffic congestion. This would occur because one or more movements is not getting enough time to satisfy its demand, with excess time existing for other movements. Although calculating the ICU for an unsignalized intersection is not necessarily valid, it can be performed with the presumption that a signal can be installed and the calculations show whether the geometrics are capable of accommodating the expected volumes.

Capacity is often defined in terms of roadway width. However, standard lanes have approximately the same capacity whether they are 11-foot or 14-foot lanes. Our data indicates that a typical lane, whether a through lane or a left-turn lane, has a capacity as high as approximately 2200 vehicles per lane per hour of green time. The *1985 Highway Capacity Manual* found capacities of 1800 vehicles per lane per hour of green time. These studies show that values in the 1600 and 1700 range as used in this analysis, should result in a conservative analysis.

INTERSECTION CAPACITY UTILIZATION (ICU)

LEVEL OF SERVICE DESCRIPTIONS FOR INTERSECTIONS

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

(a) ICU (Intersection Capacity Utilization) at various Levels of Service versus Level of Service E for urban arterial streets.

SOURCE: *Highway Capacity Manual, Special Report 87*; Highway Research Board, 1955.

APPENDIX B

Explanation of Highway Capacity Manual (HCM) Methodology

HIGHWAY CAPACITY MANUAL (HCM 2010)
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

SIGNALIZED INTERSECTIONS:

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 to 20.0
C	> 20.0 to 35.0
D	> 35.0 to 55.0
E	> 55.0 to 80.0
F	> 80.0

UNSIGNALIZED INTERSECTIONS:

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 to 15.0
C	> 15.0 to 25.0
D	> 25.0 to 35.0
E	> 35.0 to 50.0
F	> 50.0

SOURCE: *Highway Capacity Manual*, 2000 Edition, Transportation Research Board.

HIGHWAY CAPACITY MANUAL (HCM 2010)

LEVEL OF SERVICE DESCRIPTION FOR INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION
A	Low volumes, high speeds; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.
B	Operating speeds beginning to be affected by other traffic; between one and 10 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.
C	Operating speeds and maneuverability closely controlled by other traffic; between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods; recommended ideal design standard.
D	Tolerable operating speeds; 31 to 70 percent of the signal cycles have one or more vehicle which wait through more than one signal cycle during peak traffic periods; often used as design standard in urban areas.
E	Capacity; the maximum traffic volumes an intersection can accommodate; restricted speeds; 71 to 100 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.
F	Long queues of traffic; unstable flow; stoppages of long duration; traffic volumes and traffic speed can drop to zero; traffic volume will be less than the volume which occurs at Level of Service E.

SOURCE: *Highway Capacity Manual*, 2010 Edition, Transportation Research Board.

APPENDIX C

Existing Traffic Count Data

City of Lawndale
 N/S: Grevillea Avenue
 E/W: Marine Avenue
 Weather: Clear

File Name : LNDGRMAAM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

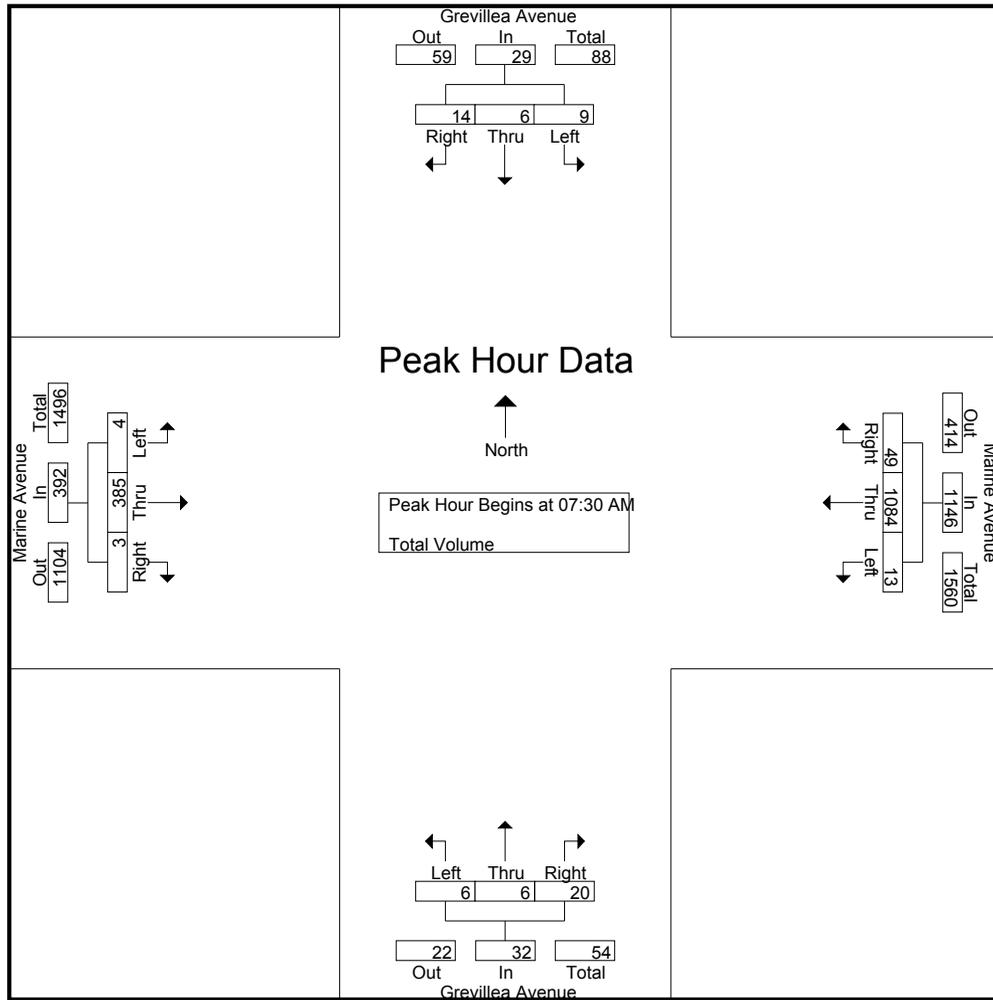
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				Marine Avenue Westbound				Grevillea Avenue Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	2	2	6	273	4	283	5	1	4	10	1	72	2	75	370
07:15 AM	0	0	3	3	3	271	4	278	1	1	2	4	1	56	0	57	342
07:30 AM	1	3	4	8	3	323	16	342	0	1	5	6	0	84	1	85	441
07:45 AM	1	0	3	4	2	296	12	310	1	3	5	9	1	95	0	96	419
Total	2	3	12	17	14	1163	36	1213	7	6	16	29	3	307	3	313	1572
08:00 AM	3	2	5	10	5	231	15	251	1	1	6	8	2	114	1	117	386
08:15 AM	4	1	2	7	3	234	6	243	4	1	4	9	1	92	1	94	353
08:30 AM	1	1	1	3	1	248	1	250	1	0	2	3	2	96	3	101	357
08:45 AM	1	0	4	5	5	226	3	234	1	1	4	6	1	95	2	98	343
Total	9	4	12	25	14	939	25	978	7	3	16	26	6	397	7	410	1439
Grand Total	11	7	24	42	28	2102	61	2191	14	9	32	55	9	704	10	723	3011
Apprch %	26.2	16.7	57.1		1.3	95.9	2.8		25.5	16.4	58.2		1.2	97.4	1.4		
Total %	0.4	0.2	0.8	1.4	0.9	69.8	2	72.8	0.5	0.3	1.1	1.8	0.3	23.4	0.3	24	

Start Time	Grevillea Avenue Southbound				Marine Avenue Westbound				Grevillea Avenue Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	3	4	8	3	323	16	342	0	1	5	6	0	84	1	85	441
07:45 AM	1	0	3	4	2	296	12	310	1	3	5	9	1	95	0	96	419
08:00 AM	3	2	5	10	5	231	15	251	1	1	6	8	2	114	1	117	386
08:15 AM	4	1	2	7	3	234	6	243	4	1	4	9	1	92	1	94	353
Total Volume	9	6	14	29	13	1084	49	1146	6	6	20	32	4	385	3	392	1599
% App. Total	31	20.7	48.3		1.1	94.6	4.3		18.8	18.8	62.5		1	98.2	0.8		
PHF	.563	.500	.700	.725	.650	.839	.766	.838	.375	.500	.833	.889	.500	.844	.750	.838	.906

City of Lawndale
 N/S: Grevillea Avenue
 E/W: Marine Avenue
 Weather: Clear

File Name : LNDGRMAAM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:30 AM				08:00 AM			
+0 mins.	1	3	4	8	6	273	4	283	0	1	5	6	2	114	1	117
+15 mins.	1	0	3	4	3	271	4	278	1	3	5	9	1	92	1	94
+30 mins.	3	2	5	10	3	323	16	342	1	1	6	8	2	96	3	101
+45 mins.	4	1	2	7	2	296	12	310	4	1	4	9	1	95	2	98
Total Volume	9	6	14	29	14	1163	36	1213	6	6	20	32	6	397	7	410
% App. Total	31	20.7	48.3		1.2	95.9	3		18.8	18.8	62.5		1.5	96.8	1.7	
PHF	.563	.500	.700	.725	.583	.900	.563	.887	.375	.500	.833	.889	.750	.871	.583	.876

City of Lawndale
 N/S: Grevillea Avenue
 E/W: Marine Avenue
 Weather: Clear

File Name : LNDGRMAPM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

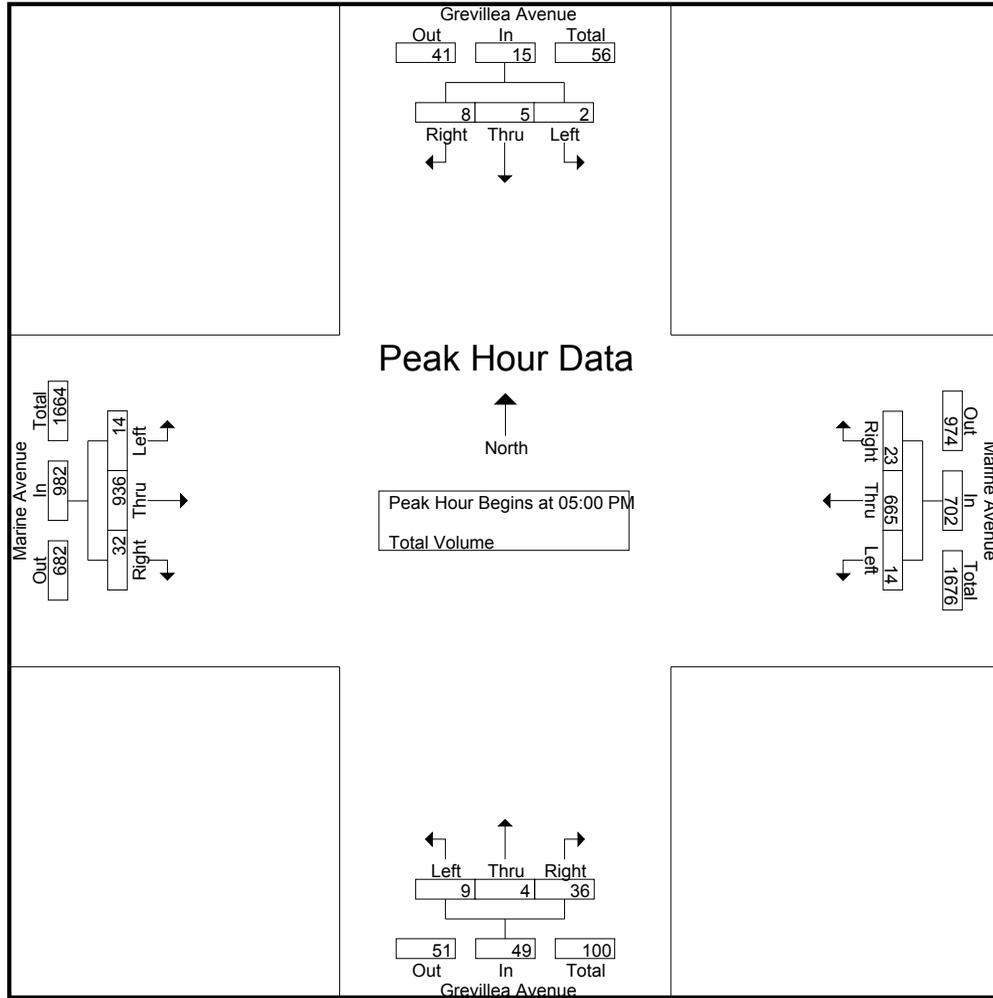
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				Marine Avenue Westbound				Grevillea Avenue Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	2	4	7	6	151	3	160	1	1	13	15	0	241	2	243	425
04:15 PM	0	0	2	2	4	154	2	160	2	0	9	11	5	224	3	232	405
04:30 PM	0	2	2	4	2	182	3	187	0	1	11	12	2	235	2	239	442
04:45 PM	0	1	1	2	3	164	2	169	0	0	7	7	6	231	9	246	424
Total	1	5	9	15	15	651	10	676	3	2	40	45	13	931	16	960	1696
05:00 PM	2	2	5	9	6	147	4	157	1	1	9	11	2	240	8	250	427
05:15 PM	0	2	0	2	0	159	5	164	5	3	12	20	3	221	7	231	417
05:30 PM	0	0	0	0	5	180	7	192	1	0	8	9	6	240	11	257	458
05:45 PM	0	1	3	4	3	179	7	189	2	0	7	9	3	235	6	244	446
Total	2	5	8	15	14	665	23	702	9	4	36	49	14	936	32	982	1748
Grand Total	3	10	17	30	29	1316	33	1378	12	6	76	94	27	1867	48	1942	3444
Apprch %	10	33.3	56.7		2.1	95.5	2.4		12.8	6.4	80.9		1.4	96.1	2.5		
Total %	0.1	0.3	0.5	0.9	0.8	38.2	1	40	0.3	0.2	2.2	2.7	0.8	54.2	1.4	56.4	

Start Time	Grevillea Avenue Southbound				Marine Avenue Westbound				Grevillea Avenue Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	2	5	9	6	147	4	157	1	1	9	11	2	240	8	250	427
05:15 PM	0	2	0	2	0	159	5	164	5	3	12	20	3	221	7	231	417
05:30 PM	0	0	0	0	5	180	7	192	1	0	8	9	6	240	11	257	458
05:45 PM	0	1	3	4	3	179	7	189	2	0	7	9	3	235	6	244	446
Total Volume	2	5	8	15	14	665	23	702	9	4	36	49	14	936	32	982	1748
% App. Total	13.3	33.3	53.3		2	94.7	3.3		18.4	8.2	73.5		1.4	95.3	3.3		
PHF	.250	.625	.400	.417	.583	.924	.821	.914	.450	.333	.750	.613	.583	.975	.727	.955	.954

City of Lawndale
 N/S: Grevillea Avenue
 E/W: Marine Avenue
 Weather: Clear

File Name : LNDGRMAPM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM				05:00 PM				04:30 PM				04:45 PM			
+0 mins.	0	0	2	2	6	147	4	157	0	1	11	12	6	231	9	246
+15 mins.	0	2	2	4	0	159	5	164	0	0	7	7	2	240	8	250
+30 mins.	0	1	1	2	5	180	7	192	1	1	9	11	3	221	7	231
+45 mins.	2	2	5	9	3	179	7	189	5	3	12	20	6	240	11	257
Total Volume	2	5	10	17	14	665	23	702	6	5	39	50	17	932	35	984
% App. Total	11.8	29.4	58.8		2	94.7	3.3		12	10	78		1.7	94.7	3.6	
PHF	.250	.625	.500	.472	.583	.924	.821	.914	.300	.417	.813	.625	.708	.971	.795	.957

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 153rd Street
 Weather: Clear

File Name : LNDGR153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

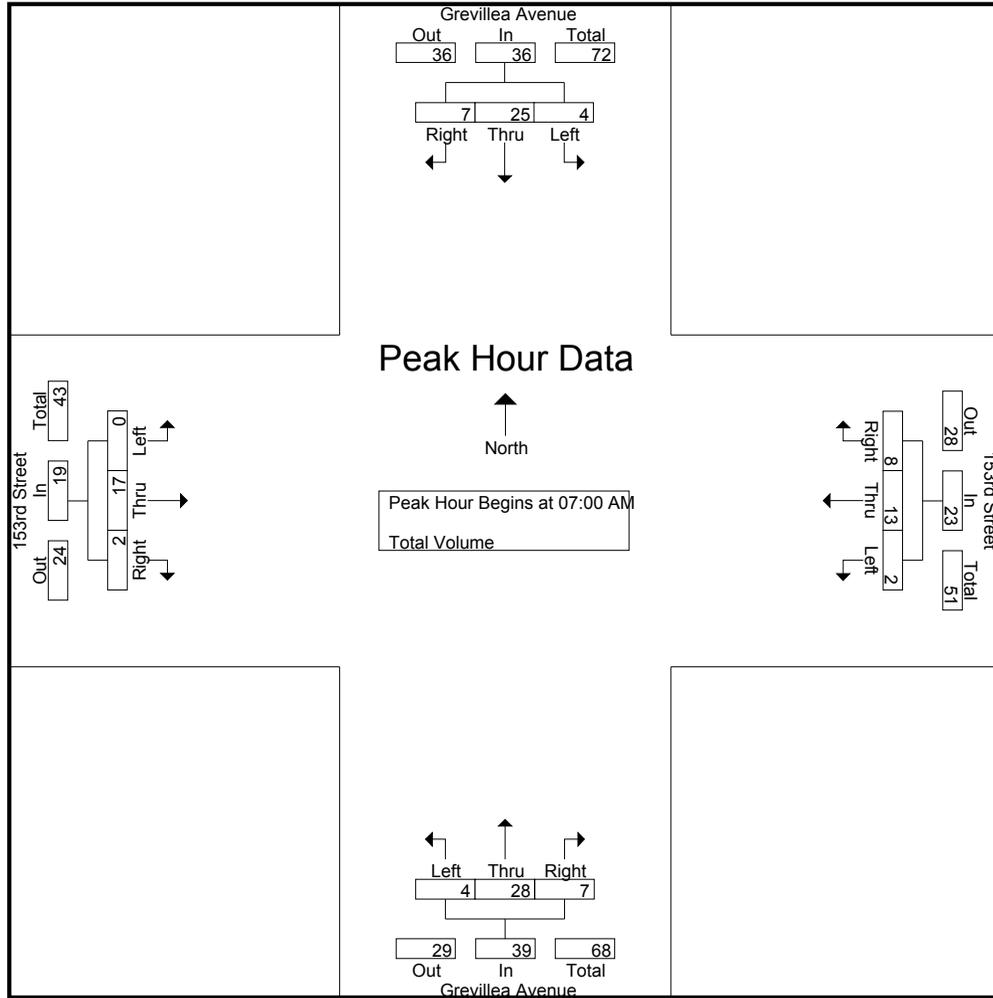
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				153rd Street Westbound				Grevillea Avenue Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	1	7	5	13	0	0	3	3	1	8	1	10	0	2	0	2	28
07:15 AM	2	8	0	10	0	3	2	5	0	3	1	4	0	6	1	7	26
07:30 AM	1	8	1	10	2	3	1	6	1	6	2	9	0	5	0	5	30
07:45 AM	0	2	1	3	0	7	2	9	2	11	3	16	0	4	1	5	33
Total	4	25	7	36	2	13	8	23	4	28	7	39	0	17	2	19	117
08:00 AM	2	4	0	6	1	4	6	11	1	5	2	8	0	0	0	0	25
08:15 AM	3	5	1	9	0	2	1	3	0	5	0	5	0	0	1	1	18
08:30 AM	1	2	1	4	2	1	1	4	0	3	2	5	0	2	0	2	15
08:45 AM	3	4	0	7	0	5	2	7	1	10	0	11	0	1	2	3	28
Total	9	15	2	26	3	12	10	25	2	23	4	29	0	3	3	6	86
Grand Total	13	40	9	62	5	25	18	48	6	51	11	68	0	20	5	25	203
Apprch %	21	64.5	14.5		10.4	52.1	37.5		8.8	75	16.2		0	80	20		
Total %	6.4	19.7	4.4	30.5	2.5	12.3	8.9	23.6	3	25.1	5.4	33.5	0	9.9	2.5	12.3	

Start Time	Grevillea Avenue Southbound				153rd Street Westbound				Grevillea Avenue Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	7	5	13	0	0	3	3	1	8	1	10	0	2	0	2	28
07:15 AM	2	8	0	10	0	3	2	5	0	3	1	4	0	6	1	7	26
07:30 AM	1	8	1	10	2	3	1	6	1	6	2	9	0	5	0	5	30
07:45 AM	0	2	1	3	0	7	2	9	2	11	3	16	0	4	1	5	33
Total Volume	4	25	7	36	2	13	8	23	4	28	7	39	0	17	2	19	117
% App. Total	11.1	69.4	19.4		8.7	56.5	34.8		10.3	71.8	17.9		0	89.5	10.5		
PHF	.500	.781	.350	.692	.250	.464	.667	.639	.500	.636	.583	.609	.000	.708	.500	.679	.886

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 153rd Street
 Weather: Clear

File Name : LNDGR153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:00 AM				07:00 AM			
+0 mins.	1	7	5	13	0	3	2	5	1	8	1	10	0	2	0	2
+15 mins.	2	8	0	10	2	3	1	6	0	3	1	4	0	6	1	7
+30 mins.	1	8	1	10	0	7	2	9	1	6	2	9	0	5	0	5
+45 mins.	0	2	1	3	1	4	6	11	2	11	3	16	0	4	1	5
Total Volume	4	25	7	36	3	17	11	31	4	28	7	39	0	17	2	19
% App. Total	11.1	69.4	19.4		9.7	54.8	35.5		10.3	71.8	17.9		0	89.5	10.5	
PHF	.500	.781	.350	.692	.375	.607	.458	.705	.500	.636	.583	.609	.000	.708	.500	.679

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 153rd Street
 Weather: Clear

File Name : LNDGR153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

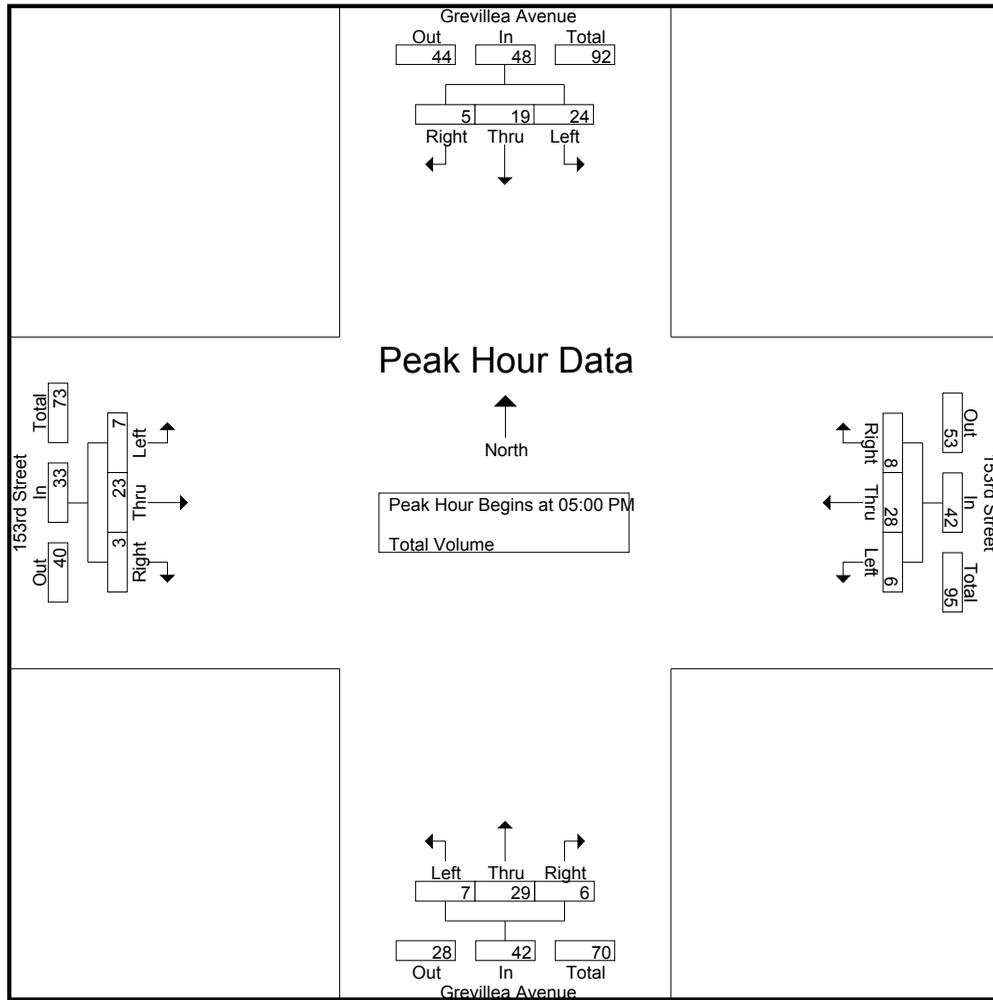
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				153rd Street Westbound				Grevillea Avenue Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	10	0	12	2	4	3	9	0	14	1	15	1	3	1	5	41
04:15 PM	1	4	0	5	1	4	0	5	3	8	4	15	0	3	0	3	28
04:30 PM	8	8	4	20	1	8	2	11	3	3	3	9	0	8	3	11	51
04:45 PM	3	8	4	15	0	3	1	4	0	6	2	8	1	5	0	6	33
Total	14	30	8	52	4	19	6	29	6	31	10	47	2	19	4	25	153
05:00 PM	6	4	0	10	3	6	2	11	1	11	1	13	0	3	1	4	38
05:15 PM	7	5	0	12	0	6	2	8	2	7	2	11	2	8	0	10	41
05:30 PM	9	5	2	16	2	10	1	13	3	5	1	9	5	6	2	13	51
05:45 PM	2	5	3	10	1	6	3	10	1	6	2	9	0	6	0	6	35
Total	24	19	5	48	6	28	8	42	7	29	6	42	7	23	3	33	165
Grand Total	38	49	13	100	10	47	14	71	13	60	16	89	9	42	7	58	318
Apprch %	38	49	13		14.1	66.2	19.7		14.6	67.4	18		15.5	72.4	12.1		
Total %	11.9	15.4	4.1	31.4	3.1	14.8	4.4	22.3	4.1	18.9	5	28	2.8	13.2	2.2	18.2	

Start Time	Grevillea Avenue Southbound				153rd Street Westbound				Grevillea Avenue Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	4	0	10	3	6	2	11	1	11	1	13	0	3	1	4	38
05:15 PM	7	5	0	12	0	6	2	8	2	7	2	11	2	8	0	10	41
05:30 PM	9	5	2	16	2	10	1	13	3	5	1	9	5	6	2	13	51
05:45 PM	2	5	3	10	1	6	3	10	1	6	2	9	0	6	0	6	35
Total Volume	24	19	5	48	6	28	8	42	7	29	6	42	7	23	3	33	165
% App. Total	50	39.6	10.4		14.3	66.7	19		16.7	69	14.3		21.2	69.7	9.1		
PHF	.667	.950	.417	.750	.500	.700	.667	.808	.583	.659	.750	.808	.350	.719	.375	.635	.809

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 153rd Street
 Weather: Clear

File Name : LNDGR153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				05:00 PM				04:00 PM				04:45 PM			
+0 mins.	8	8	4	20	3	6	2	11	0	14	1	15	1	5	0	6
+15 mins.	3	8	4	15	0	6	2	8	3	8	4	15	0	3	1	4
+30 mins.	6	4	0	10	2	10	1	13	3	3	3	9	2	8	0	10
+45 mins.	7	5	0	12	1	6	3	10	0	6	2	8	5	6	2	13
Total Volume	24	25	8	57	6	28	8	42	6	31	10	47	8	22	3	33
% App. Total	42.1	43.9	14		14.3	66.7	19		12.8	66	21.3		24.2	66.7	9.1	
PHF	.750	.781	.500	.713	.500	.700	.667	.808	.500	.554	.625	.783	.400	.688	.375	.635

City of Lawndale
 N/S: Hawthorne Boulevard South
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHS153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

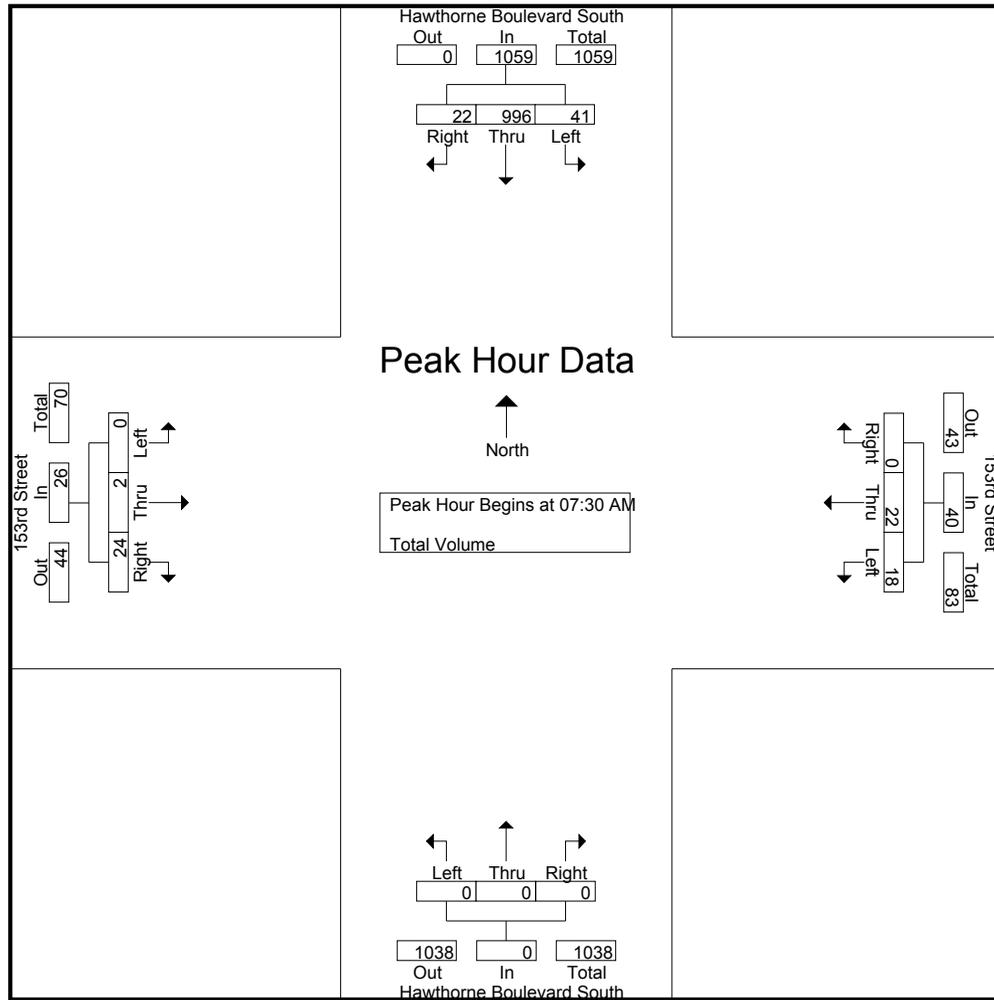
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard South Southbound				153rd Street Westbound				Hawthorne Boulevard South Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	1	160	1	162	4	5	0	9	0	0	0	0	0	0	5	5	176
07:15 AM	8	215	1	224	11	5	0	16	0	0	0	0	0	1	7	8	248
07:30 AM	10	239	6	255	4	6	0	10	0	0	0	0	0	2	6	8	273
07:45 AM	7	283	8	298	7	5	0	12	0	0	0	0	0	0	8	8	318
Total	26	897	16	939	26	21	0	47	0	0	0	0	0	3	26	29	1015
08:00 AM	17	211	4	232	6	9	0	15	0	0	0	0	0	0	6	6	253
08:15 AM	7	263	4	274	1	2	0	3	0	0	0	0	0	0	4	4	281
08:30 AM	9	198	8	215	5	1	0	6	0	0	0	0	0	2	5	7	228
08:45 AM	13	255	5	273	6	6	0	12	0	0	0	0	0	3	4	7	292
Total	46	927	21	994	18	18	0	36	0	0	0	0	0	5	19	24	1054
Grand Total	72	1824	37	1933	44	39	0	83	0	0	0	0	0	8	45	53	2069
Apprch %	3.7	94.4	1.9		53	47	0		0	0	0		0	15.1	84.9		
Total %	3.5	88.2	1.8	93.4	2.1	1.9	0	4	0	0	0	0	0	0.4	2.2	2.6	

Start Time	Hawthorne Boulevard South Southbound				153rd Street Westbound				Hawthorne Boulevard South Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	10	239	6	255	4	6	0	10	0	0	0	0	0	2	6	8	273
07:45 AM	7	283	8	298	7	5	0	12	0	0	0	0	0	0	8	8	318
08:00 AM	17	211	4	232	6	9	0	15	0	0	0	0	0	0	6	6	253
08:15 AM	7	263	4	274	1	2	0	3	0	0	0	0	0	0	4	4	281
Total Volume	41	996	22	1059	18	22	0	40	0	0	0	0	0	2	24	26	1125
% App. Total	3.9	94.1	2.1		45	55	0		0	0	0		0	7.7	92.3		
PHF	.603	.880	.688	.888	.643	.611	.000	.667	.000	.000	.000	.000	.000	.250	.750	.813	.884

City of Lawndale
 N/S: Hawthorne Boulevard South
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHS153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	10	239	6	255	11	5	0	16	0	0	0	0	0	1	7	8
+15 mins.	7	283	8	298	4	6	0	10	0	0	0	0	0	2	6	8
+30 mins.	17	211	4	232	7	5	0	12	0	0	0	0	0	0	8	8
+45 mins.	7	263	4	274	6	9	0	15	0	0	0	0	0	0	6	6
Total Volume	41	996	22	1059	28	25	0	53	0	0	0	0	0	3	27	30
% App. Total	3.9	94.1	2.1		52.8	47.2	0		0	0	0		0	10	90	
PHF	.603	.880	.688	.888	.636	.694	.000	.828	.000	.000	.000	.000	.000	.375	.844	.938

City of Lawndale
 N/S: Hawthorne Boulevard South
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHS153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

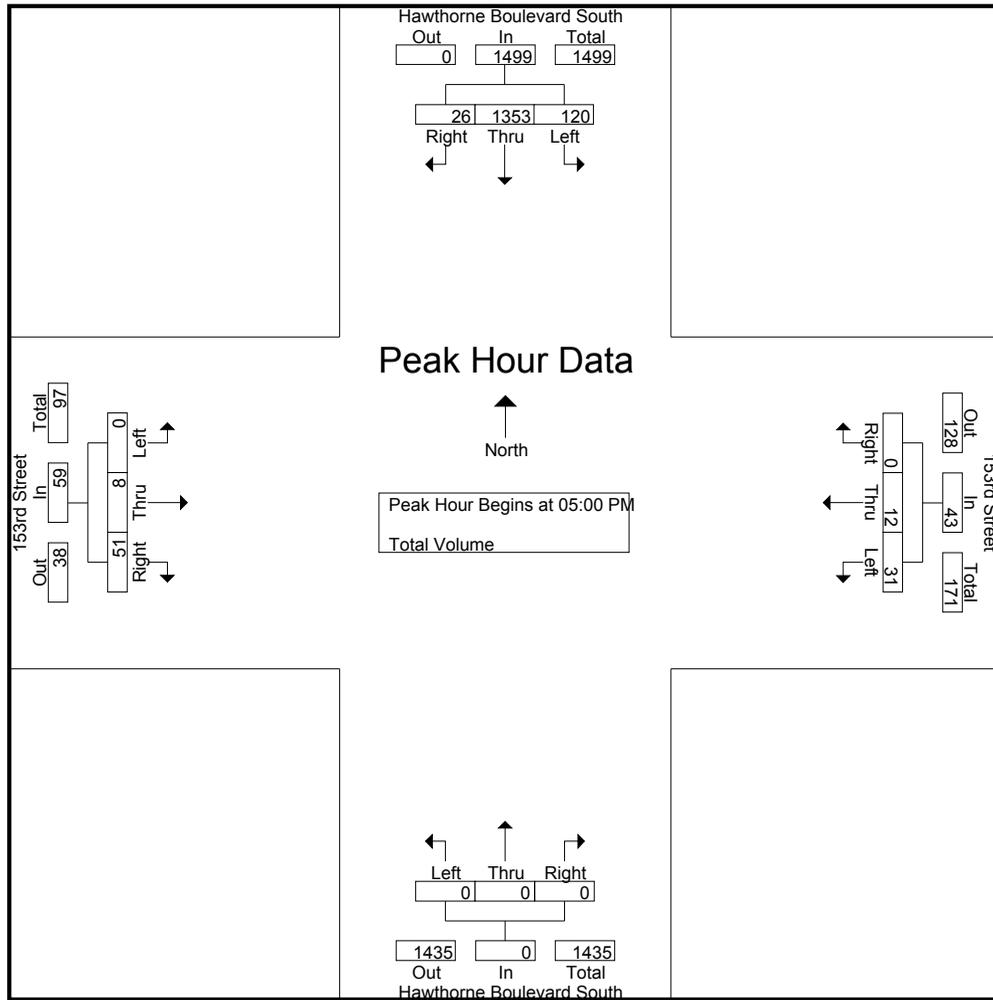
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard South Southbound				153rd Street Westbound				Hawthorne Boulevard South Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	30	306	3	339	6	7	0	13	0	0	0	0	0	2	5	7	359
04:15 PM	25	316	5	346	7	4	0	11	0	0	0	0	0	3	5	8	365
04:30 PM	22	269	5	296	5	3	0	8	0	0	0	0	0	5	18	23	327
04:45 PM	29	344	4	377	9	1	0	10	0	0	0	0	0	1	8	9	396
Total	106	1235	17	1358	27	15	0	42	0	0	0	0	0	11	36	47	1447
05:00 PM	37	310	5	352	9	3	0	12	0	0	0	0	0	1	13	14	378
05:15 PM	20	364	4	388	8	2	0	10	0	0	0	0	0	3	12	15	413
05:30 PM	41	301	8	350	6	4	0	10	0	0	0	0	0	2	18	20	380
05:45 PM	22	378	9	409	8	3	0	11	0	0	0	0	0	2	8	10	430
Total	120	1353	26	1499	31	12	0	43	0	0	0	0	0	8	51	59	1601
Grand Total	226	2588	43	2857	58	27	0	85	0	0	0	0	0	19	87	106	3048
Apprch %	7.9	90.6	1.5		68.2	31.8	0		0	0	0	0	0	17.9	82.1		
Total %	7.4	84.9	1.4	93.7	1.9	0.9	0	2.8	0	0	0	0	0	0.6	2.9	3.5	

Start Time	Hawthorne Boulevard South Southbound				153rd Street Westbound				Hawthorne Boulevard South Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	37	310	5	352	9	3	0	12	0	0	0	0	0	1	13	14	378
05:15 PM	20	364	4	388	8	2	0	10	0	0	0	0	0	3	12	15	413
05:30 PM	41	301	8	350	6	4	0	10	0	0	0	0	0	2	18	20	380
05:45 PM	22	378	9	409	8	3	0	11	0	0	0	0	0	2	8	10	430
Total Volume	120	1353	26	1499	31	12	0	43	0	0	0	0	0	8	51	59	1601
% App. Total	8	90.3	1.7		72.1	27.9	0		0	0	0	0	0	13.6	86.4		
PHF	.732	.895	.722	.916	.861	.750	.000	.896	.000	.000	.000	.000	.000	.667	.708	.738	.931

City of Lawndale
 N/S: Hawthorne Boulevard South
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHS153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				04:30 PM			
+0 mins.	37	310	5	352	9	3	0	12	0	0	0	0	0	5	18	23
+15 mins.	20	364	4	388	8	2	0	10	0	0	0	0	0	1	8	9
+30 mins.	41	301	8	350	6	4	0	10	0	0	0	0	0	1	13	14
+45 mins.	22	378	9	409	8	3	0	11	0	0	0	0	0	3	12	15
Total Volume	120	1353	26	1499	31	12	0	43	0	0	0	0	0	10	51	61
% App. Total	8	90.3	1.7		72.1	27.9	0		0	0	0	0	0	16.4	83.6	
PHF	.732	.895	.722	.916	.861	.750	.000	.896	.000	.000	.000	.000	.000	.500	.708	.663

City of Lawndale
 N/S: Hawthorne Boulevard North
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHN153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

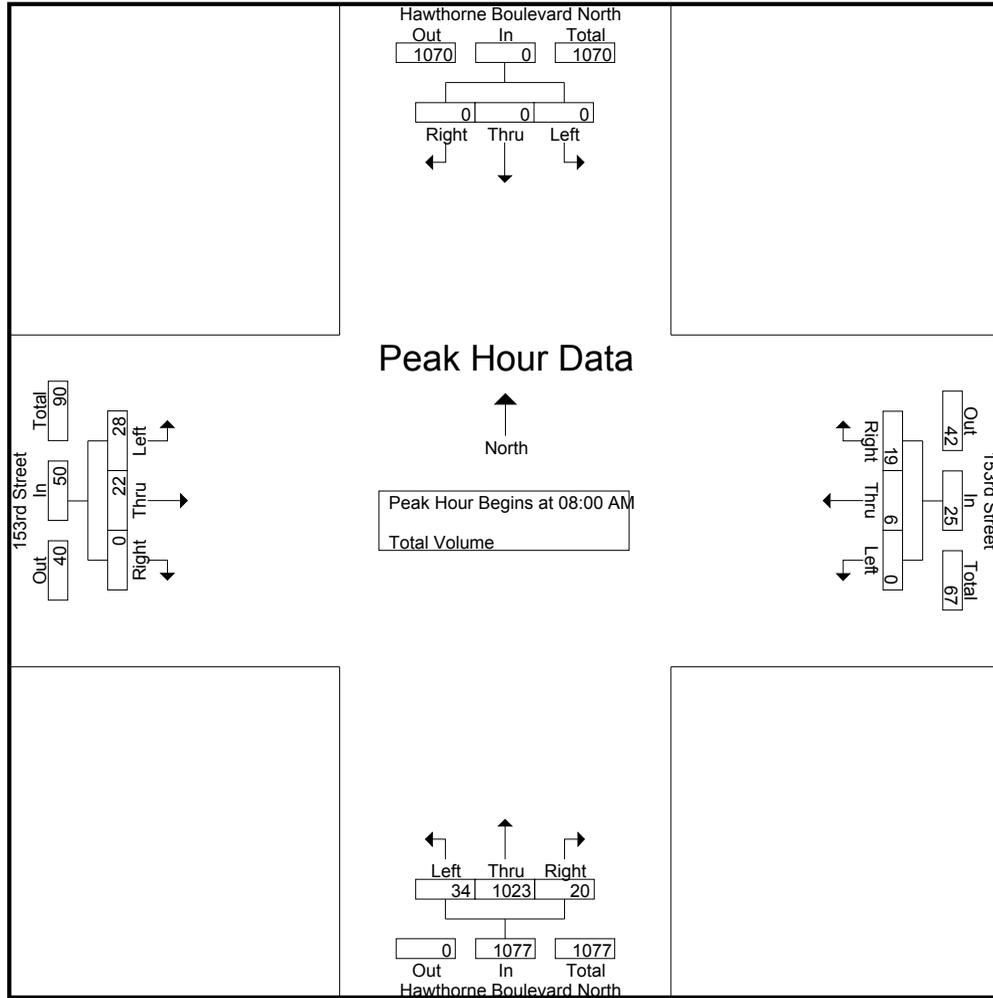
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard North Southbound				153rd Street Westbound				Hawthorne Boulevard North Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	1	6	7	9	206	2	217	0	1	0	1	225
07:15 AM	0	0	0	0	0	5	4	9	10	229	5	244	2	4	0	6	259
07:30 AM	0	0	0	0	0	2	3	5	8	250	3	261	9	2	0	11	277
07:45 AM	0	0	0	0	0	3	2	5	9	269	8	286	2	4	0	6	297
Total	0	0	0	0	0	11	15	26	36	954	18	1008	13	11	0	24	1058
08:00 AM	0	0	0	0	0	2	3	5	14	258	4	276	9	7	0	16	297
08:15 AM	0	0	0	0	0	0	5	5	3	248	6	257	6	2	0	8	270
08:30 AM	0	0	0	0	0	1	6	7	7	250	2	259	6	5	0	11	277
08:45 AM	0	0	0	0	0	3	5	8	10	267	8	285	7	8	0	15	308
Total	0	0	0	0	0	6	19	25	34	1023	20	1077	28	22	0	50	1152
Grand Total	0	0	0	0	0	17	34	51	70	1977	38	2085	41	33	0	74	2210
Apprch %	0	0	0		0	33.3	66.7		3.4	94.8	1.8		55.4	44.6	0		
Total %	0	0	0		0	0.8	1.5	2.3	3.2	89.5	1.7	94.3	1.9	1.5	0	3.3	

Start Time	Hawthorne Boulevard North Southbound				153rd Street Westbound				Hawthorne Boulevard North Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	2	3	5	14	258	4	276	9	7	0	16	297
08:15 AM	0	0	0	0	0	0	5	5	3	248	6	257	6	2	0	8	270
08:30 AM	0	0	0	0	0	1	6	7	7	250	2	259	6	5	0	11	277
08:45 AM	0	0	0	0	0	3	5	8	10	267	8	285	7	8	0	15	308
Total Volume	0	0	0	0	0	6	19	25	34	1023	20	1077	28	22	0	50	1152
% App. Total	0	0	0		0	24	76		3.2	95	1.9		56	44	0		
PHF	.000	.000	.000	.000	.000	.500	.792	.781	.607	.958	.625	.945	.778	.688	.000	.781	.935

City of Lawndale
 N/S: Hawthorne Boulevard North
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHN153AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				08:00 AM			
+0 mins.	0	0	0	0	0	1	6	7	8	250	3	261	9	7	0	16
+15 mins.	0	0	0	0	0	5	4	9	9	269	8	286	6	2	0	8
+30 mins.	0	0	0	0	0	2	3	5	14	258	4	276	6	5	0	11
+45 mins.	0	0	0	0	0	3	2	5	3	248	6	257	7	8	0	15
Total Volume	0	0	0	0	0	11	15	26	34	1025	21	1080	28	22	0	50
% App. Total	0	0	0	0	0	42.3	57.7		3.1	94.9	1.9		56	44	0	
PHF	.000	.000	.000	.000	.000	.550	.625	.722	.607	.953	.656	.944	.778	.688	.000	.781

City of Lawndale
 N/S: Hawthorne Boulevard North
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHN153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

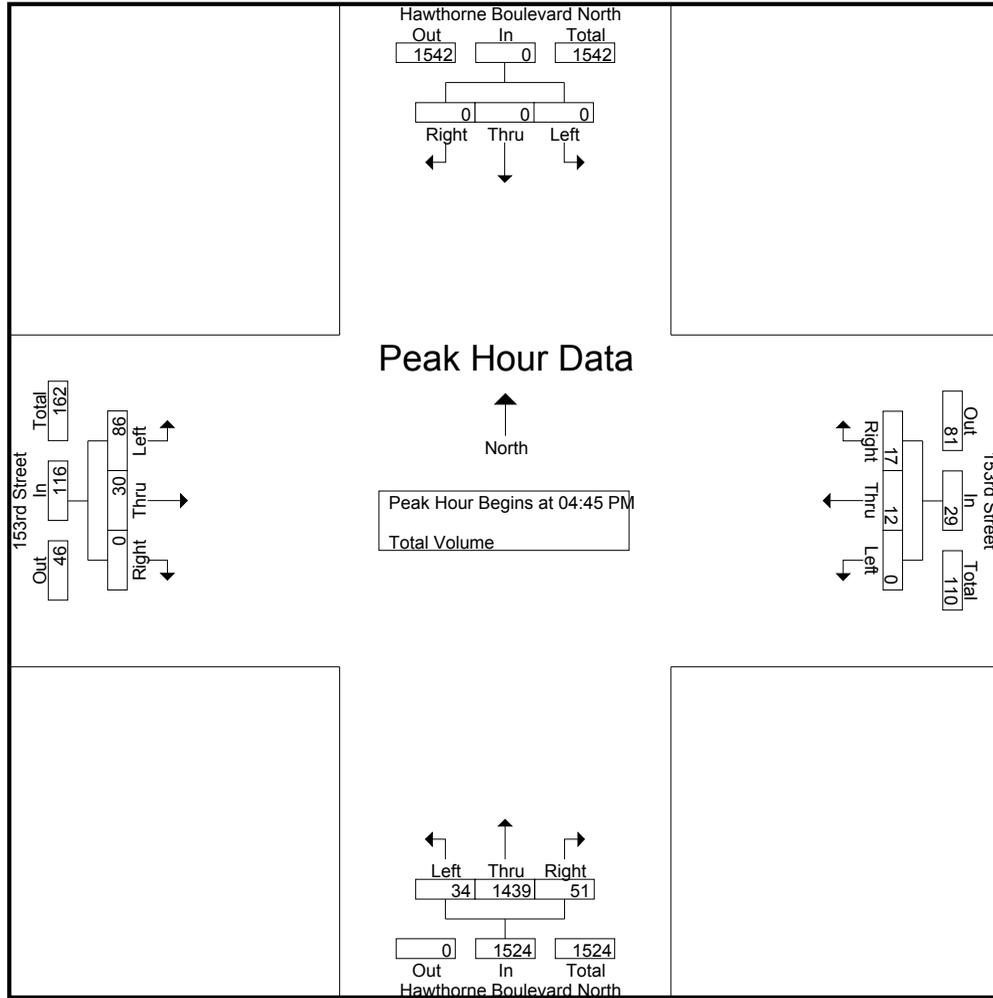
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard North Southbound				153rd Street Westbound				Hawthorne Boulevard North Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	1	5	6	9	331	4	344	23	11	0	34	384
04:15 PM	0	0	0	0	0	1	5	6	11	350	7	368	23	5	0	28	402
04:30 PM	0	0	0	0	0	1	3	4	10	315	8	333	19	6	0	25	362
04:45 PM	0	0	0	0	0	3	3	6	9	382	10	401	21	5	0	26	433
Total	0	0	0	0	0	6	16	22	39	1378	29	1446	86	27	0	113	1581
05:00 PM	0	0	0	0	0	1	5	6	11	342	13	366	27	6	0	33	405
05:15 PM	0	0	0	0	0	6	4	10	3	347	15	365	11	10	0	21	396
05:30 PM	0	0	0	0	0	2	5	7	11	368	13	392	27	9	0	36	435
05:45 PM	0	0	0	0	0	2	1	3	8	356	11	375	15	9	0	24	402
Total	0	0	0	0	0	11	15	26	33	1413	52	1498	80	34	0	114	1638
Grand Total	0	0	0	0	0	17	31	48	72	2791	81	2944	166	61	0	227	3219
Apprch %	0	0	0		0	35.4	64.6		2.4	94.8	2.8		73.1	26.9	0		
Total %	0	0	0		0	0.5	1	1.5	2.2	86.7	2.5	91.5	5.2	1.9	0	7.1	

Start Time	Hawthorne Boulevard North Southbound				153rd Street Westbound				Hawthorne Boulevard North Northbound				153rd Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	3	3	6	9	382	10	401	21	5	0	26	433
05:00 PM	0	0	0	0	0	1	5	6	11	342	13	366	27	6	0	33	405
05:15 PM	0	0	0	0	0	6	4	10	3	347	15	365	11	10	0	21	396
05:30 PM	0	0	0	0	0	2	5	7	11	368	13	392	27	9	0	36	435
Total Volume	0	0	0	0	0	12	17	29	34	1439	51	1524	86	30	0	116	1669
% App. Total	0	0	0		0	41.4	58.6		2.2	94.4	3.3		74.1	25.9	0		
PHF	.000	.000	.000	.000	.000	.500	.850	.725	.773	.942	.850	.950	.796	.750	.000	.806	.959

City of Lawndale
 N/S: Hawthorne Boulevard North
 E/W: 153rd Street
 Weather: Clear

File Name : LNDHN153PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	3	3	6	9	382	10	401	21	5	0	26
+15 mins.	0	0	0	0	0	1	5	6	11	342	13	366	27	6	0	33
+30 mins.	0	0	0	0	0	6	4	10	3	347	15	365	11	10	0	21
+45 mins.	0	0	0	0	0	2	5	7	11	368	13	392	27	9	0	36
Total Volume	0	0	0	0	0	12	17	29	34	1439	51	1524	86	30	0	116
% App. Total	0	0	0	0	0	41.4	58.6		2.2	94.4	3.3		74.1	25.9	0	
PHF	.000	.000	.000	.000	.000	.500	.850	.725	.773	.942	.850	.950	.796	.750	.000	.806

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 154th Street
 Weather: Clear

File Name : LNDGR154AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

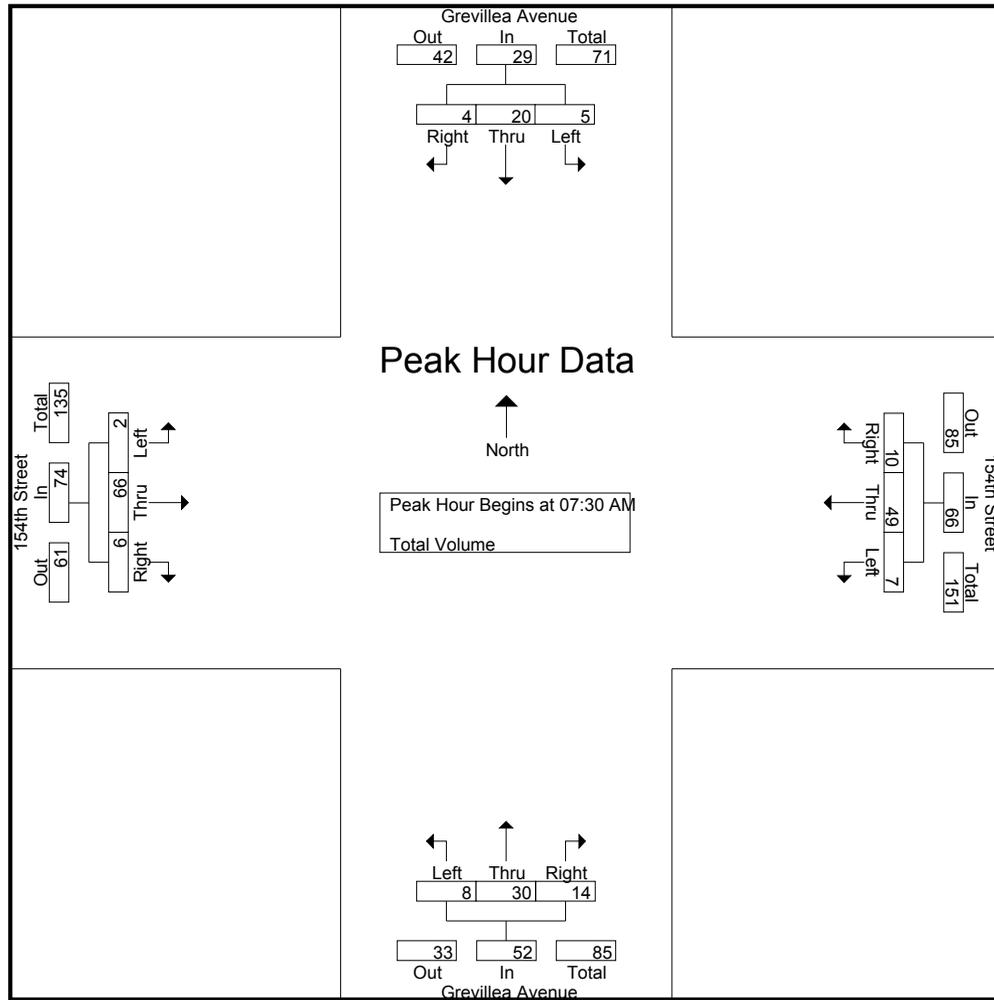
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				154th Street Westbound				Grevillea Avenue Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	3	5	0	8	0	4	3	7	3	6	1	10	0	8	0	8	33
07:15 AM	0	12	0	12	1	5	1	7	0	2	5	7	0	6	0	6	32
07:30 AM	1	8	1	10	3	15	3	21	1	8	1	10	0	13	1	14	55
07:45 AM	1	4	0	5	2	13	6	21	2	11	5	18	1	24	4	29	73
Total	5	29	1	35	6	37	13	56	6	27	12	45	1	51	5	57	193
08:00 AM	1	4	2	7	2	13	1	16	2	7	4	13	0	20	1	21	57
08:15 AM	2	4	1	7	0	8	0	8	3	4	4	11	1	9	0	10	36
08:30 AM	1	2	2	5	1	9	2	12	1	2	5	8	0	11	2	13	38
08:45 AM	0	5	0	5	1	8	3	12	3	7	2	12	0	13	3	16	45
Total	4	15	5	24	4	38	6	48	9	20	15	44	1	53	6	60	176
Grand Total	9	44	6	59	10	75	19	104	15	47	27	89	2	104	11	117	369
Apprch %	15.3	74.6	10.2		9.6	72.1	18.3		16.9	52.8	30.3		1.7	88.9	9.4		
Total %	2.4	11.9	1.6	16	2.7	20.3	5.1	28.2	4.1	12.7	7.3	24.1	0.5	28.2	3	31.7	

Start Time	Grevillea Avenue Southbound				154th Street Westbound				Grevillea Avenue Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	8	1	10	3	15	3	21	1	8	1	10	0	13	1	14	55
07:45 AM	1	4	0	5	2	13	6	21	2	11	5	18	1	24	4	29	73
08:00 AM	1	4	2	7	2	13	1	16	2	7	4	13	0	20	1	21	57
08:15 AM	2	4	1	7	0	8	0	8	3	4	4	11	1	9	0	10	36
Total Volume	5	20	4	29	7	49	10	66	8	30	14	52	2	66	6	74	221
% App. Total	17.2	69	13.8		10.6	74.2	15.2		15.4	57.7	26.9		2.7	89.2	8.1		
PHF	.625	.625	.500	.725	.583	.817	.417	.786	.667	.682	.700	.722	.500	.688	.375	.638	.757

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 154th Street
 Weather: Clear

File Name : LNDGR154AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	3	5	0	8	3	15	3	21	1	8	1	10	0	13	1	14
+15 mins.	0	12	0	12	2	13	6	21	2	11	5	18	1	24	4	29
+30 mins.	1	8	1	10	2	13	1	16	2	7	4	13	0	20	1	21
+45 mins.	1	4	0	5	0	8	0	8	3	4	4	11	1	9	0	10
Total Volume	5	29	1	35	7	49	10	66	8	30	14	52	2	66	6	74
% App. Total	14.3	82.9	2.9		10.6	74.2	15.2		15.4	57.7	26.9		2.7	89.2	8.1	
PHF	.417	.604	.250	.729	.583	.817	.417	.786	.667	.682	.700	.722	.500	.688	.375	.638

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 154th Street
 Weather: Clear

File Name : LNDGR154PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

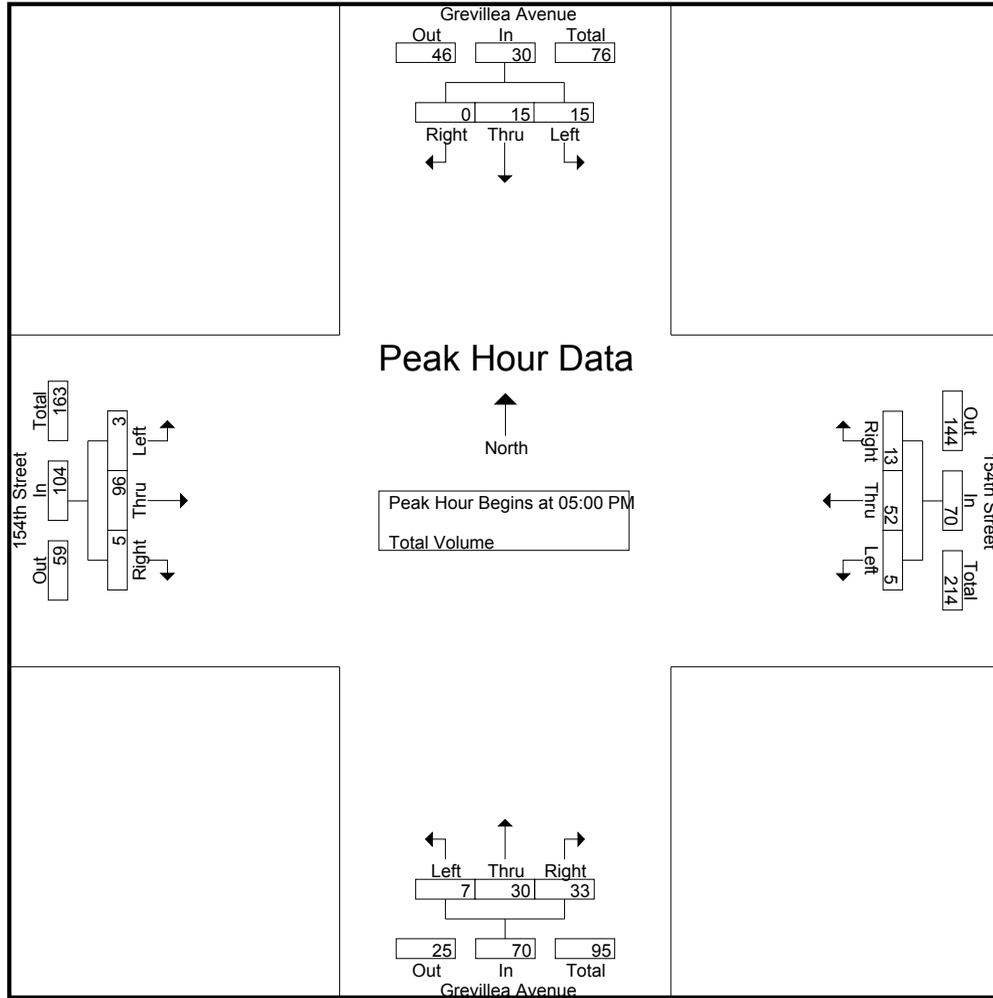
Groups Printed- Total Volume

Start Time	Grevillea Avenue Southbound				154th Street Westbound				Grevillea Avenue Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	8	4	14	2	7	4	13	0	9	5	14	2	12	0	14	55
04:15 PM	1	5	1	7	3	7	7	17	0	6	4	10	3	20	1	24	58
04:30 PM	3	6	1	10	0	5	2	7	3	6	5	14	2	21	2	25	56
04:45 PM	5	3	1	9	1	7	4	12	1	5	8	14	0	15	2	17	52
Total	11	22	7	40	6	26	17	49	4	26	22	52	7	68	5	80	221
05:00 PM	3	6	0	9	2	16	3	21	2	10	10	22	2	19	0	21	73
05:15 PM	3	2	0	5	1	16	3	20	2	5	7	14	1	29	2	32	71
05:30 PM	7	3	0	10	0	8	4	12	2	7	7	16	0	29	2	31	69
05:45 PM	2	4	0	6	2	12	3	17	1	8	9	18	0	19	1	20	61
Total	15	15	0	30	5	52	13	70	7	30	33	70	3	96	5	104	274
Grand Total	26	37	7	70	11	78	30	119	11	56	55	122	10	164	10	184	495
Apprch %	37.1	52.9	10		9.2	65.5	25.2		9	45.9	45.1		5.4	89.1	5.4		
Total %	5.3	7.5	1.4	14.1	2.2	15.8	6.1	24	2.2	11.3	11.1	24.6	2	33.1	2	37.2	

Start Time	Grevillea Avenue Southbound				154th Street Westbound				Grevillea Avenue Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	6	0	9	2	16	3	21	2	10	10	22	2	19	0	21	73
05:15 PM	3	2	0	5	1	16	3	20	2	5	7	14	1	29	2	32	71
05:30 PM	7	3	0	10	0	8	4	12	2	7	7	16	0	29	2	31	69
05:45 PM	2	4	0	6	2	12	3	17	1	8	9	18	0	19	1	20	61
Total Volume	15	15	0	30	5	52	13	70	7	30	33	70	3	96	5	104	274
% App. Total	50	50	0		7.1	74.3	18.6		10	42.9	47.1		2.9	92.3	4.8		
PHF	.536	.625	.000	.750	.625	.813	.813	.833	.875	.750	.825	.795	.375	.828	.625	.813	.938

City of Lawndale
 N/S: Grevillea Avenue
 E/W: 154th Street
 Weather: Clear

File Name : LNDGR154PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	2	8	4	14	2	16	3	21	2	10	10	22	2	19	0	21
+15 mins.	1	5	1	7	1	16	3	20	2	5	7	14	1	29	2	32
+30 mins.	3	6	1	10	0	8	4	12	2	7	7	16	0	29	2	31
+45 mins.	5	3	1	9	2	12	3	17	1	8	9	18	0	19	1	20
Total Volume	11	22	7	40	5	52	13	70	7	30	33	70	3	96	5	104
% App. Total	27.5	55	17.5		7.1	74.3	18.6		10	42.9	47.1		2.9	92.3	4.8	
PHF	.550	.688	.438	.714	.625	.813	.813	.833	.875	.750	.825	.795	.375	.828	.625	.813

City of Lawndale
 N/S: Hawthorne Boulevard
 E/W: 154th Street
 Weather: Clear

File Name : LNDHA154AM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 1

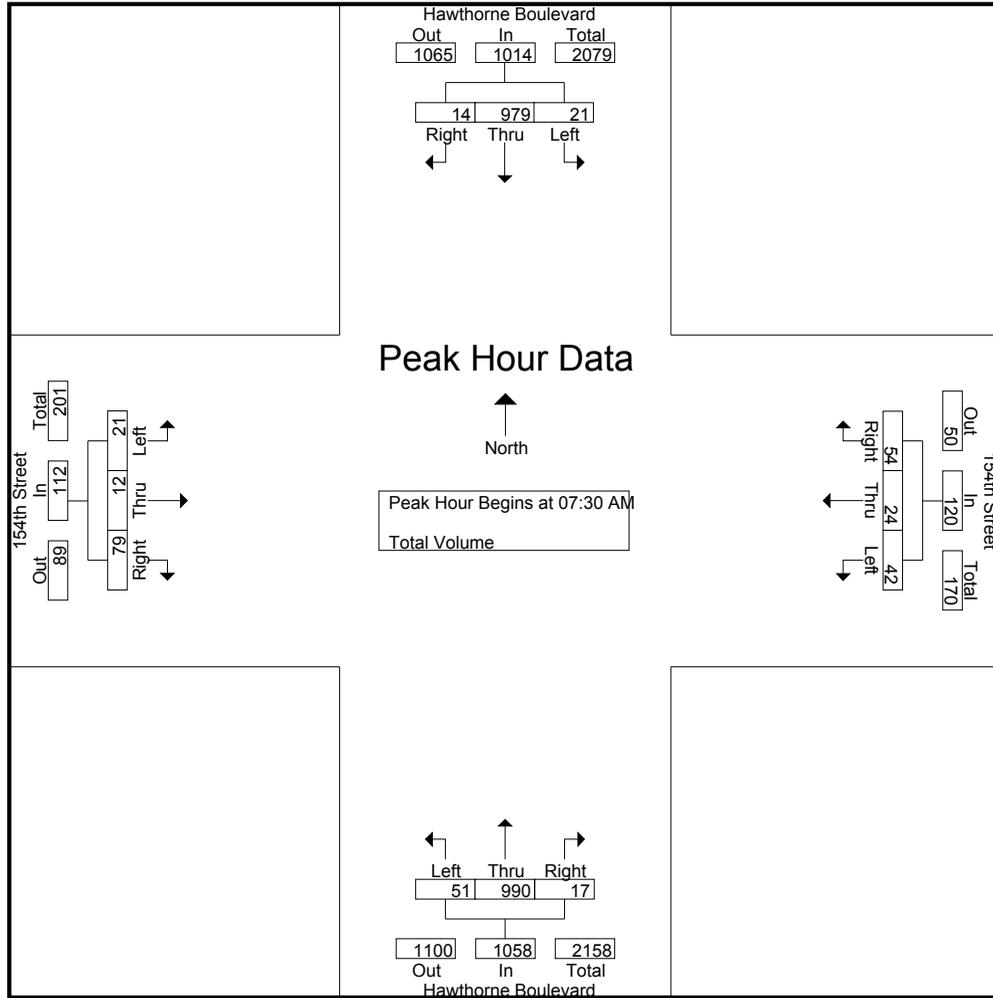
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard Southbound				154th Street Westbound				Hawthorne Boulevard Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	4	166	1	171	10	1	6	17	10	208	4	222	8	1	4	13	423
07:15 AM	4	212	3	219	14	2	17	33	8	221	9	238	1	3	9	13	503
07:30 AM	5	236	1	242	16	8	14	38	16	244	5	265	3	2	16	21	566
07:45 AM	2	282	6	290	10	9	13	32	12	258	0	270	8	3	27	38	630
Total	15	896	11	922	50	20	50	120	46	931	18	995	20	9	56	85	2122
08:00 AM	5	215	3	223	8	2	17	27	15	249	5	269	6	4	21	31	550
08:15 AM	9	246	4	259	8	5	10	23	8	239	7	254	4	3	15	22	558
08:30 AM	8	196	3	207	14	5	7	26	6	249	4	259	8	2	13	23	515
08:45 AM	10	243	8	261	16	4	7	27	2	270	7	279	8	1	8	17	584
Total	32	900	18	950	46	16	41	103	31	1007	23	1061	26	10	57	93	2207
Grand Total	47	1796	29	1872	96	36	91	223	77	1938	41	2056	46	19	113	178	4329
Apprch %	2.5	95.9	1.5		43	16.1	40.8		3.7	94.3	2		25.8	10.7	63.5		
Total %	1.1	41.5	0.7	43.2	2.2	0.8	2.1	5.2	1.8	44.8	0.9	47.5	1.1	0.4	2.6	4.1	

Start Time	Hawthorne Boulevard Southbound				154th Street Westbound				Hawthorne Boulevard Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	236	1	242	16	8	14	38	16	244	5	265	3	2	16	21	566
07:45 AM	2	282	6	290	10	9	13	32	12	258	0	270	8	3	27	38	630
08:00 AM	5	215	3	223	8	2	17	27	15	249	5	269	6	4	21	31	550
08:15 AM	9	246	4	259	8	5	10	23	8	239	7	254	4	3	15	22	558
Total Volume	21	979	14	1014	42	24	54	120	51	990	17	1058	21	12	79	112	2304
% App. Total	2.1	96.5	1.4		35	20	45		4.8	93.6	1.6		18.8	10.7	70.5		
PHF	.583	.868	.583	.874	.656	.667	.794	.789	.797	.959	.607	.980	.656	.750	.731	.737	.914

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 E/W: 154th Street
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 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				08:00 AM				07:45 AM			
+0 mins.	5	236	1	242	14	2	17	33	15	249	5	269	8	3	27	38
+15 mins.	2	282	6	290	16	8	14	38	8	239	7	254	6	4	21	31
+30 mins.	5	215	3	223	10	9	13	32	6	249	4	259	4	3	15	22
+45 mins.	9	246	4	259	8	2	17	27	2	270	7	279	8	2	13	23
Total Volume	21	979	14	1014	48	21	61	130	31	1007	23	1061	26	12	76	114
% App. Total	2.1	96.5	1.4		36.9	16.2	46.9		2.9	94.9	2.2		22.8	10.5	66.7	
PHF	.583	.868	.583	.874	.750	.583	.897	.855	.517	.932	.821	.951	.813	.750	.704	.750

City of Lawndale
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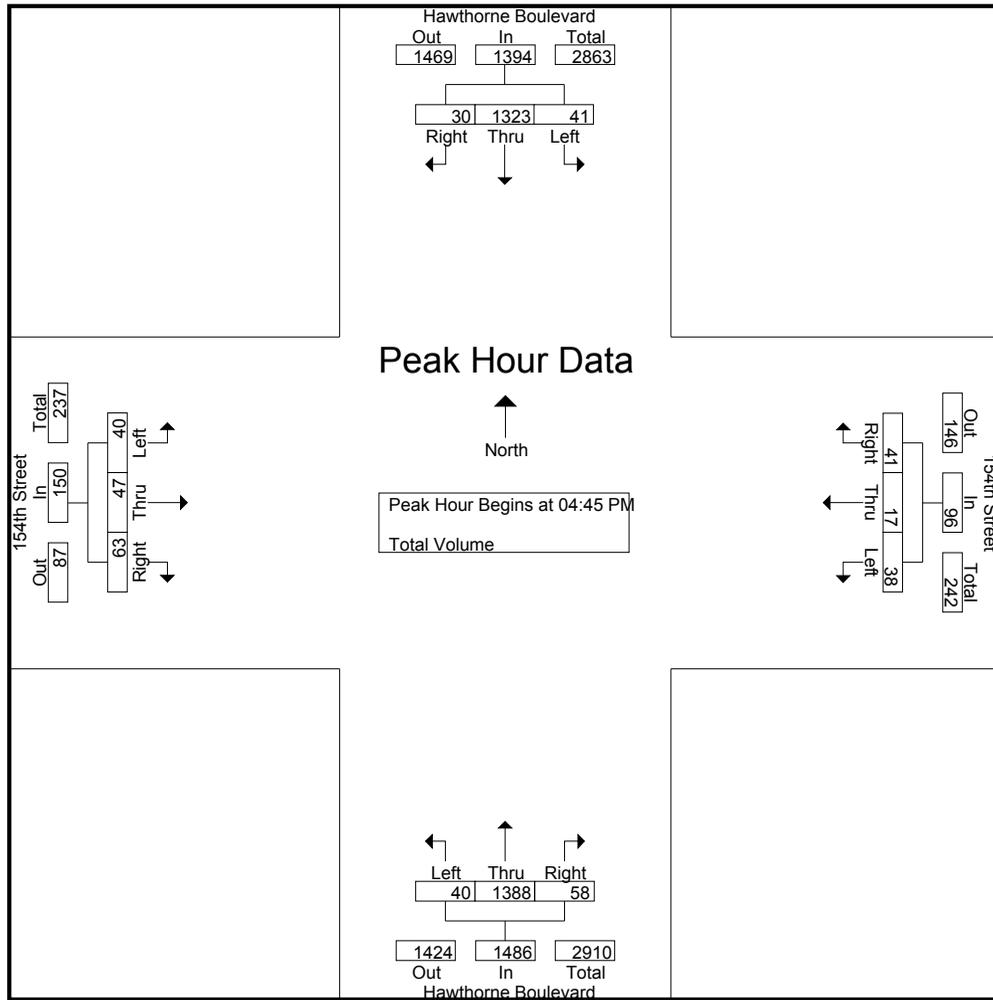
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard Southbound				154th Street Westbound				Hawthorne Boulevard Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	16	292	7	315	10	3	7	20	13	307	17	337	9	1	16	26	698
04:15 PM	12	311	6	329	12	1	11	24	9	348	14	371	5	8	20	33	757
04:30 PM	8	279	4	291	9	2	3	14	3	311	14	328	12	6	12	30	663
04:45 PM	13	337	9	359	9	4	11	24	6	355	22	383	10	6	12	28	794
Total	49	1219	26	1294	40	10	32	82	31	1321	67	1419	36	21	60	117	2912
05:00 PM	10	298	8	316	7	6	12	25	17	321	12	350	11	13	10	34	725
05:15 PM	3	354	11	368	13	3	13	29	12	336	11	359	14	7	22	43	799
05:30 PM	15	334	2	351	9	4	5	18	5	376	13	394	5	21	19	45	808
05:45 PM	9	359	12	380	3	9	12	24	5	341	10	356	13	6	15	34	794
Total	37	1345	33	1415	32	22	42	96	39	1374	46	1459	43	47	66	156	3126
Grand Total	86	2564	59	2709	72	32	74	178	70	2695	113	2878	79	68	126	273	6038
Apprch %	3.2	94.6	2.2		40.4	18	41.6		2.4	93.6	3.9		28.9	24.9	46.2		
Total %	1.4	42.5	1	44.9	1.2	0.5	1.2	2.9	1.2	44.6	1.9	47.7	1.3	1.1	2.1	4.5	

Start Time	Hawthorne Boulevard Southbound				154th Street Westbound				Hawthorne Boulevard Northbound				154th Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	13	337	9	359	9	4	11	24	6	355	22	383	10	6	12	28	794
05:00 PM	10	298	8	316	7	6	12	25	17	321	12	350	11	13	10	34	725
05:15 PM	3	354	11	368	13	3	13	29	12	336	11	359	14	7	22	43	799
05:30 PM	15	334	2	351	9	4	5	18	5	376	13	394	5	21	19	45	808
Total Volume	41	1323	30	1394	38	17	41	96	40	1388	58	1486	40	47	63	150	3126
% App. Total	2.9	94.9	2.2		39.6	17.7	42.7		2.7	93.4	3.9		26.7	31.3	42		
PHF	.683	.934	.682	.947	.731	.708	.788	.828	.588	.923	.659	.943	.714	.560	.716	.833	.967

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 E/W: 154th Street
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File Name : LNDHA154PM
 Site Code : 00715337
 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	10	298	8	316	9	4	11	24	6	355	22	383	11	13	10	34
+15 mins.	3	354	11	368	7	6	12	25	17	321	12	350	14	7	22	43
+30 mins.	15	334	2	351	13	3	13	29	12	336	11	359	5	21	19	45
+45 mins.	9	359	12	380	9	4	5	18	5	376	13	394	13	6	15	34
Total Volume	37	1345	33	1415	38	17	41	96	40	1388	58	1486	43	47	66	156
% App. Total	2.6	95.1	2.3		39.6	17.7	42.7		2.7	93.4	3.9		27.6	30.1	42.3	
PHF	.617	.937	.688	.931	.731	.708	.788	.828	.588	.923	.659	.943	.768	.560	.750	.867

City of Lawndale
 N/S: Hawthorne Boulevard
 E/W: Marine Avenue
 Weather: Clear

File Name : LNDHAMAAM
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 Page No : 1

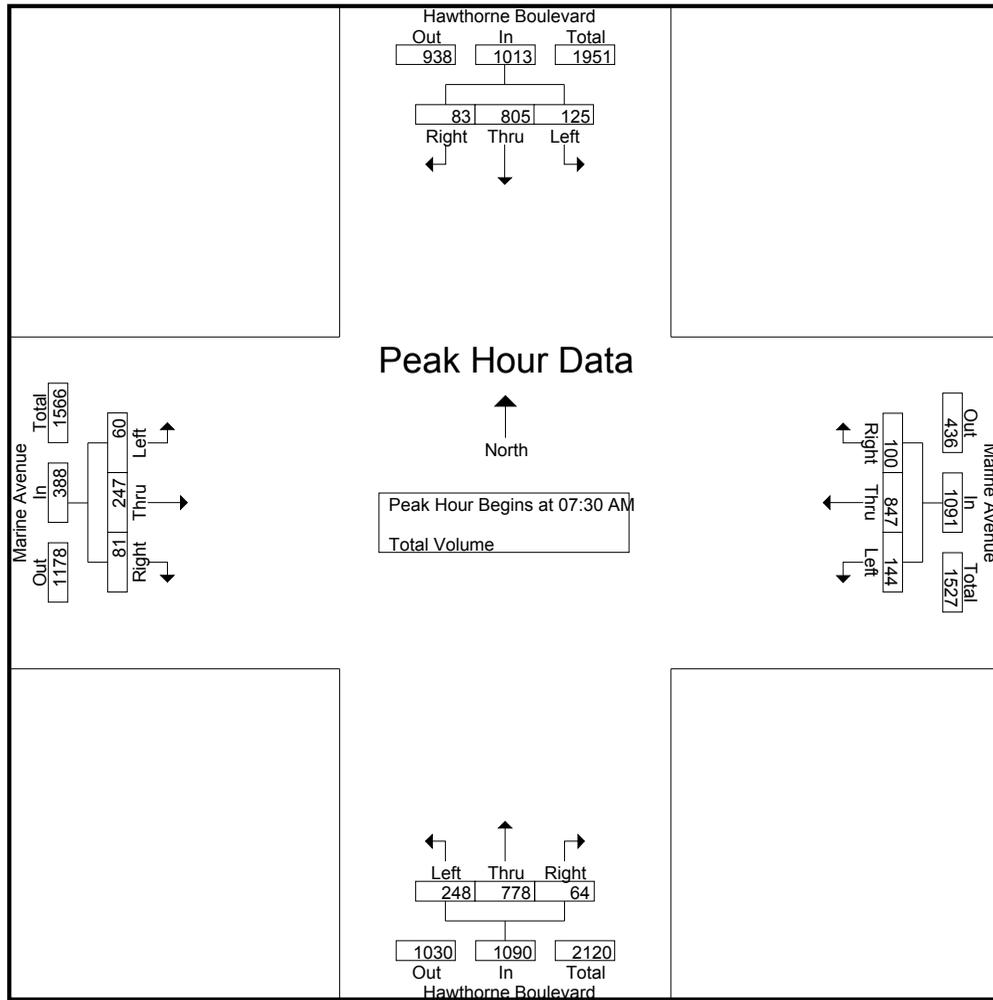
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard Southbound				Marine Avenue Westbound				Hawthorne Boulevard Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	14	120	20	154	40	228	14	282	47	133	8	188	13	43	11	67	691
07:15 AM	8	177	14	199	30	222	25	277	50	180	4	234	13	48	6	67	777
07:30 AM	17	194	28	239	43	268	18	329	55	173	13	241	11	50	16	77	886
07:45 AM	31	225	15	271	42	218	32	292	84	218	10	312	17	61	19	97	972
Total	70	716	77	863	155	936	89	1180	236	704	35	975	54	202	52	308	3326
08:00 AM	36	163	19	218	36	188	29	253	53	172	21	246	19	78	26	123	840
08:15 AM	41	223	21	285	23	173	21	217	56	215	20	291	13	58	20	91	884
08:30 AM	23	151	14	188	28	200	27	255	53	180	14	247	22	60	18	100	790
08:45 AM	17	198	14	229	47	157	36	240	61	214	20	295	17	50	19	86	850
Total	117	735	68	920	134	718	113	965	223	781	75	1079	71	246	83	400	3364
Grand Total	187	1451	145	1783	289	1654	202	2145	459	1485	110	2054	125	448	135	708	6690
Apprch %	10.5	81.4	8.1		13.5	77.1	9.4		22.3	72.3	5.4		17.7	63.3	19.1		
Total %	2.8	21.7	2.2	26.7	4.3	24.7	3	32.1	6.9	22.2	1.6	30.7	1.9	6.7	2	10.6	

Start Time	Hawthorne Boulevard Southbound				Marine Avenue Westbound				Hawthorne Boulevard Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	17	194	28	239	43	268	18	329	55	173	13	241	11	50	16	77	886
07:45 AM	31	225	15	271	42	218	32	292	84	218	10	312	17	61	19	97	972
08:00 AM	36	163	19	218	36	188	29	253	53	172	21	246	19	78	26	123	840
08:15 AM	41	223	21	285	23	173	21	217	56	215	20	291	13	58	20	91	884
Total Volume	125	805	83	1013	144	847	100	1091	248	778	64	1090	60	247	81	388	3582
% App. Total	12.3	79.5	8.2		13.2	77.6	9.2		22.8	71.4	5.9		15.5	63.7	20.9		
PHF	.762	.894	.741	.889	.837	.790	.781	.829	.738	.892	.762	.873	.789	.792	.779	.789	.921

City of Lawndale
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File Name : LNDHAMAAM
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 Start Date : 6/18/2015
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:45 AM				07:45 AM			
+0 mins.	17	194	28	239	40	228	14	282	84	218	10	312	17	61	19	97
+15 mins.	31	225	15	271	30	222	25	277	53	172	21	246	19	78	26	123
+30 mins.	36	163	19	218	43	268	18	329	56	215	20	291	13	58	20	91
+45 mins.	41	223	21	285	42	218	32	292	53	180	14	247	22	60	18	100
Total Volume	125	805	83	1013	155	936	89	1180	246	785	65	1096	71	257	83	411
% App. Total	12.3	79.5	8.2		13.1	79.3	7.5		22.4	71.6	5.9		17.3	62.5	20.2	
PHF	.762	.894	.741	.889	.901	.873	.695	.897	.732	.900	.774	.878	.807	.824	.798	.835

City of Lawndale
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 E/W: Marine Avenue
 Weather: Clear

File Name : LNDHAMAPM
 Site Code : 00715337
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 Page No : 1

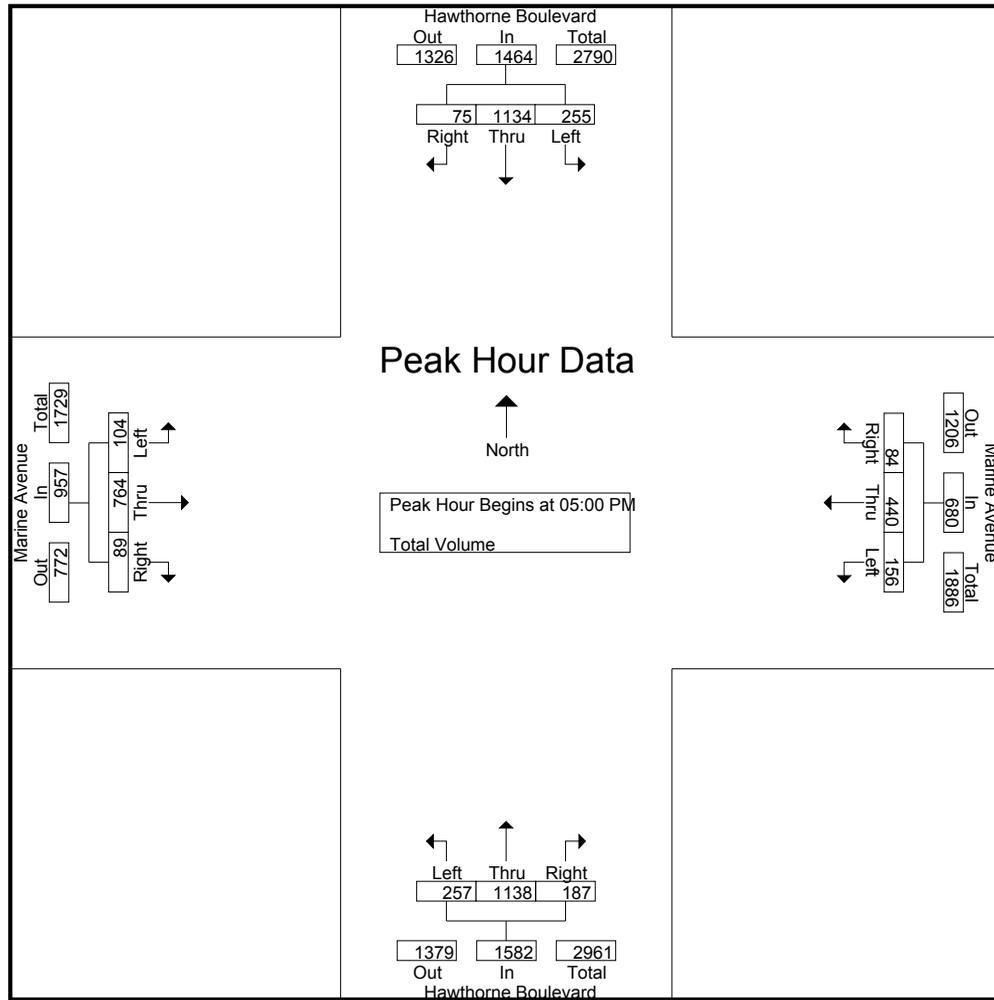
Groups Printed- Total Volume

Start Time	Hawthorne Boulevard Southbound				Marine Avenue Westbound				Hawthorne Boulevard Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	68	232	21	321	32	92	22	146	61	254	49	364	30	196	35	261	1092
04:15 PM	62	266	19	347	25	91	18	134	68	274	36	378	29	168	28	225	1084
04:30 PM	51	213	25	289	34	126	15	175	60	256	38	354	21	182	22	225	1043
04:45 PM	46	289	22	357	31	100	19	150	73	288	36	397	30	183	25	238	1142
Total	227	1000	87	1314	122	409	74	605	262	1072	159	1493	110	729	110	949	4361
05:00 PM	64	246	18	328	36	100	28	164	61	267	66	394	17	193	24	234	1120
05:15 PM	68	317	12	397	32	102	17	151	66	292	30	388	21	182	17	220	1156
05:30 PM	59	276	29	364	53	126	15	194	63	290	39	392	22	207	19	248	1198
05:45 PM	64	295	16	375	35	112	24	171	67	289	52	408	44	182	29	255	1209
Total	255	1134	75	1464	156	440	84	680	257	1138	187	1582	104	764	89	957	4683
Grand Total	482	2134	162	2778	278	849	158	1285	519	2210	346	3075	214	1493	199	1906	9044
Apprch %	17.4	76.8	5.8		21.6	66.1	12.3		16.9	71.9	11.3		11.2	78.3	10.4		
Total %	5.3	23.6	1.8	30.7	3.1	9.4	1.7	14.2	5.7	24.4	3.8	34	2.4	16.5	2.2	21.1	

Start Time	Hawthorne Boulevard Southbound				Marine Avenue Westbound				Hawthorne Boulevard Northbound				Marine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	64	246	18	328	36	100	28	164	61	267	66	394	17	193	24	234	1120
05:15 PM	68	317	12	397	32	102	17	151	66	292	30	388	21	182	17	220	1156
05:30 PM	59	276	29	364	53	126	15	194	63	290	39	392	22	207	19	248	1198
05:45 PM	64	295	16	375	35	112	24	171	67	289	52	408	44	182	29	255	1209
Total Volume	255	1134	75	1464	156	440	84	680	257	1138	187	1582	104	764	89	957	4683
% App. Total	17.4	77.5	5.1		22.9	64.7	12.4		16.2	71.9	11.8		10.9	79.8	9.3		
PHF	.938	.894	.647	.922	.736	.873	.750	.876	.959	.974	.708	.969	.591	.923	.767	.938	.968

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 Page No : 2



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 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	64	246	18	328	36	100	28	164	61	267	66	394	17	193	24	234
+15 mins.	68	317	12	397	32	102	17	151	66	292	30	388	21	182	17	220
+30 mins.	59	276	29	364	53	126	15	194	63	290	39	392	22	207	19	248
+45 mins.	64	295	16	375	35	112	24	171	67	289	52	408	44	182	29	255
Total Volume	255	1134	75	1464	156	440	84	680	257	1138	187	1582	104	764	89	957
% App. Total	17.4	77.5	5.1		22.9	64.7	12.4		16.2	71.9	11.8		10.9	79.8	9.3	
PHF	.938	.894	.647	.922	.736	.873	.750	.876	.959	.974	.708	.969	.591	.923	.767	.938

APPENDIX D

Level of Service Analysis Worksheets

Intersection													
Int Delay, s/veh	1.4												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	385	3	13	1084	49	6	6	20	9	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	418	3	14	1178	53	7	7	22	10	7	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1232	0	0	422	0	0	1050	1689	211	1454	1663	616
Stage 1	-	-	-	-	-	-	429	429	-	1233	1233	-
Stage 2	-	-	-	-	-	-	621	1260	-	221	430	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	561	-	-	1134	-	-	181	93	794	91	96	433
Stage 1	-	-	-	-	-	-	574	582	-	187	247	-
Stage 2	-	-	-	-	-	-	442	240	-	761	582	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	561	-	-	1134	-	-	159	88	794	80	91	433
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	88	-	80	91	-
Stage 1	-	-	-	-	-	-	569	577	-	185	237	-
Stage 2	-	-	-	-	-	-	398	230	-	725	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	22.2	38.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	244	561	-	-	1134	-	-	138
HCM Lane V/C Ratio	0.143	0.008	-	-	0.012	-	-	0.228
HCM Control Delay (s)	22.2	11.5	0.1	-	8.2	0.2	-	38.6
HCM Lane LOS	C	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.8

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	17	2	2	13	8	4	28	7	4	25	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	2	2	14	9	4	30	8	4	27	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	21	0	0	60	47	20	62	44	18
Stage 1	-	-	-	-	-	-	20	20	-	23	23	-
Stage 2	-	-	-	-	-	-	40	27	-	39	21	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1592	-	-	1595	-	-	936	845	1058	933	848	1061
Stage 1	-	-	-	-	-	-	999	879	-	995	876	-
Stage 2	-	-	-	-	-	-	975	873	-	976	878	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1592	-	-	1595	-	-	906	844	1058	900	847	1061
Mov Cap-2 Maneuver	-	-	-	-	-	-	906	844	-	900	847	-
Stage 1	-	-	-	-	-	-	999	879	-	995	875	-
Stage 2	-	-	-	-	-	-	937	872	-	935	878	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	9.3	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	882	1592	-	-	1595	-	-	888
HCM Lane V/C Ratio	0.048	-	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.2
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	2	24	18	22	0	0	0	0	41	996	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	26	20	24	0	0	0	0	45	1083	24

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1196	1184	552	523	1196	0	0	0	0
Stage 1	1184	1184	-	0	0	-	-	-	-
Stage 2	12	0	-	523	1196	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	247	188	409	533	185	-	-	-	-
Stage 1	186	261	-	-	-	-	-	-	-
Stage 2	-	-	-	511	258	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	247	0	409	533	0	-	-	-	-
Mov Cap-2 Maneuver	247	0	-	533	0	-	-	-	-
Stage 1	186	0	-	-	0	-	-	-	-
Stage 2	-	0	-	511	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.5	-	-
HCM LOS	B	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	409	-	-	-
HCM Lane V/C Ratio	0.069	-	-	-
HCM Control Delay (s)	14.5	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection												
Int Delay, s/veh	0.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	22	0	0	6	19	34	1023	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	24	0	0	7	21	37	1112	22	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	522	1208	0	1209	1197	566	0	0	0
Stage 1	0	0	-	1197	1197	-	-	-	-
Stage 2	522	1208	-	12	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	534	182	-	243	185	400	-	-	-
Stage 1	-	-	-	183	257	-	-	-	-
Stage 2	511	254	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	534	0	-	243	0	400	-	-	-
Mov Cap-2 Maneuver	534	0	-	243	0	-	-	-	-
Stage 1	-	0	-	183	0	-	-	-	-
Stage 2	511	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		14.7	
HCM LOS	-	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	400
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	14.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection												
Intersection Delay, s/veh	7.5											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	2	66	6	0	7	49	10	0	8	30	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	72	7	0	8	53	11	0	9	33	15
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.5	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	3%	11%	17%
Vol Thru, %	58%	89%	74%	69%
Vol Right, %	27%	8%	15%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	74	66	29
LT Vol	8	2	7	5
Through Vol	30	66	49	20
RT Vol	14	6	10	4
Lane Flow Rate	57	80	72	32
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.092	0.081	0.037
Departure Headway (Hd)	4.09	4.098	4.078	4.192
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	864	867	870	842
Service Time	2.171	2.158	2.141	2.278
HCM Lane V/C Ratio	0.066	0.092	0.083	0.038
HCM Control Delay	7.5	7.6	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: Existing	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	51	1	1600	0.032	x	0.239
NB Thru	990	3	4800	0.210		
NB Right	17	0	0	0.000		
SB Left	21	1	1600	0.013	x	
SB Thru	979	3	4800	0.207		
SB Right	14	0	0	0.000		
EB Left	21	0	0	0.000	x	0.075
EB Thru	12	1	1600	0.070		
EB Right	79	0	0	0.000		
WB Left	42	0	0	0.000	x	
WB Thru	24	1	1600	0.075		
WB Right	54	0	0	0.000		
Sum of Critical V/C Ratios						0.314
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.414
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: Existing	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	248	2	2880	0.086	x	0.271
NB Thru	778	3	4800	0.175		
NB Right	64	0	0	0.000		
SB Left	125	2	2880	0.043	x	
SB Thru	805	3	4800	0.185		
SB Right	83	0	0	0.000		
EB Left	60	1	1600	0.038	x	0.333
EB Thru	247	2	3200	0.103		
EB Right	81	0	0	0.000		
WB Left	144	1	1600	0.090	x	
WB Thru	847	2	3200	0.296		
WB Right	100	0	0	0.000		
Sum of Critical V/C Ratios						0.605
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.705
Level of Service (LOS) - Refer to table below						C

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection													
Int Delay, s/veh	1.5												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	936	32	14	665	23	9	4	36	2	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1017	35	15	723	25	10	4	39	2	5	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	748	0	0	1052	0	0	1460	1843	526	1307	1849	374
Stage 1	-	-	-	-	-	-	1065	1065	-	766	766	-
Stage 2	-	-	-	-	-	-	395	778	-	541	1083	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	856	-	-	657	-	-	90	74	496	117	74	623
Stage 1	-	-	-	-	-	-	238	297	-	361	410	-
Stage 2	-	-	-	-	-	-	602	405	-	493	292	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	856	-	-	657	-	-	78	68	496	96	68	623
Mov Cap-2 Maneuver	-	-	-	-	-	-	78	68	-	96	68	-
Stage 1	-	-	-	-	-	-	228	284	-	345	394	-
Stage 2	-	-	-	-	-	-	563	389	-	428	279	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	29.6	34.1
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	199	856	-	-	657	-	-	140
HCM Lane V/C Ratio	0.268	0.018	-	-	0.023	-	-	0.116
HCM Control Delay (s)	29.6	9.3	0.2	-	10.6	0.2	-	34.1
HCM Lane LOS	D	A	A	-	B	A	-	D
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-	-	0.4

Intersection												
Int Delay, s/veh	5.8											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	23	3	6	28	8	7	29	6	24	19	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	25	3	7	30	9	8	32	7	26	21	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	28	0	0	103	94	27	109	91	35
Stage 1	-	-	-	-	-	-	42	42	-	48	48	-
Stage 2	-	-	-	-	-	-	61	52	-	61	43	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1571	-	-	1585	-	-	877	796	1048	870	799	1038
Stage 1	-	-	-	-	-	-	972	860	-	965	855	-
Stage 2	-	-	-	-	-	-	950	852	-	950	859	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1571	-	-	1585	-	-	849	788	1048	832	791	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	849	788	-	832	791	-
Stage 1	-	-	-	-	-	-	967	856	-	960	851	-
Stage 2	-	-	-	-	-	-	917	848	-	905	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1	9.6	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	827	1571	-	-	1585	-	-	832
HCM Lane V/C Ratio	0.055	0.005	-	-	0.004	-	-	0.063
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	8	51	31	12	0	0	0	0	120	1353	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	55	34	13	0	0	0	0	130	1471	28

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1753	1746	748	853	1760	0	0	0	0
Stage 1	1746	1746	-	0	0	-	-	-	-
Stage 2	7	0	-	853	1760	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	127	85	305	368	84	-	-	-	-
Stage 1	83	139	-	-	-	-	-	-	-
Stage 2	-	-	-	342	136	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	127	0	305	368	0	-	-	-	-
Mov Cap-2 Maneuver	127	0	-	368	0	-	-	-	-
Stage 1	83	0	-	-	0	-	-	-	-
Stage 2	-	0	-	342	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	19.9	-	-
HCM LOS	C	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	305	-	-	-
HCM Lane V/C Ratio	0.21	-	-	-
HCM Control Delay (s)	19.9	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-

Intersection												
Int Delay, s/veh	0.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	86	30	0	0	12	17	34	1439	51	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	33	0	0	13	18	37	1564	55	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	706	1693	0	1682	1666	809	0	0	0
Stage 1	0	0	-	1666	1666	-	-	-	-
Stage 2	706	1693	-	16	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	434	92	-	138	96	278	-	-	-
Stage 1	-	-	-	93	152	-	-	-	-
Stage 2	410	147	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	434	0	-	138	0	278	-	-	-
Mov Cap-2 Maneuver	434	0	-	138	0	-	-	-	-
Stage 1	-	0	-	93	0	-	-	-	-
Stage 2	410	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	-	19.6	-
HCM LOS	-	C	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	278
HCM Lane V/C Ratio	-	-	-	0.113
HCM Control Delay (s)	-	-	-	19.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	96	5	0	5	52	13	0	7	30	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	104	5	0	5	57	14	0	8	33	36
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	7.6	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	7%	50%
Vol Thru, %	43%	92%	74%	50%
Vol Right, %	47%	5%	19%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	104	70	30
LT Vol	7	3	5	15
Through Vol	30	96	52	15
RT Vol	33	5	13	0
Lane Flow Rate	76	113	76	33
Geometry Grp	1	1	1	1
Degree of Util (X)	0.087	0.131	0.087	0.041
Departure Headway (Hd)	4.127	4.159	4.113	4.534
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	873	851	858	794
Service Time	2.128	2.237	2.202	2.536
HCM Lane V/C Ratio	0.087	0.133	0.089	0.042
HCM Control Delay	7.5	7.9	7.6	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: Existing	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	40	1	1600	0.025	x	0.327
NB Thru	1388	3	4800	0.301		
NB Right	58	0	0	0.000		
SB Left	41	1	1600	0.026	x	
SB Thru	1323	3	4800	0.282		
SB Right	30	0	0	0.000		
EB Left	40	0	0	0.000	x	0.094
EB Thru	47	1	1600	0.094		
EB Right	63	0	0	0.000		
WB Left	38	0	0	0.000	x	
WB Thru	17	1	1600	0.060		
WB Right	41	0	0	0.000		
Sum of Critical V/C Ratios						0.421
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.521
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: Existing	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	257	2	2880	0.089	x	0.365
NB Thru	1138	3	4800	0.276		
NB Right	187	0	0	0.000		
SB Left	255	2	2880	0.089	x	
SB Thru	1134	3	4800	0.252		
SB Right	75	0	0	0.000		
EB Left	104	1	1600	0.065	x	0.364
EB Thru	764	2	3200	0.267		
EB Right	89	0	0	0.000		
WB Left	156	1	1600	0.098	x	
WB Thru	440	2	3200	0.164		
WB Right	84	0	0	0.000		
Sum of Critical V/C Ratios						0.729
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.829
Level of Service (LOS) - Refer to table below						D

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection													
Int Delay, s/veh	1.4												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	385	3	13	1084	49	7	6	20	9	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	418	3	14	1178	53	8	7	22	10	7	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1232	0	0	422	0	0	1050	1689	211	1454	1663	616
Stage 1	-	-	-	-	-	-	429	429	-	1233	1233	-
Stage 2	-	-	-	-	-	-	621	1260	-	221	430	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	561	-	-	1134	-	-	181	93	794	91	96	433
Stage 1	-	-	-	-	-	-	574	582	-	187	247	-
Stage 2	-	-	-	-	-	-	442	240	-	761	582	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	561	-	-	1134	-	-	159	88	794	80	91	433
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	88	-	80	91	-
Stage 1	-	-	-	-	-	-	569	577	-	185	237	-
Stage 2	-	-	-	-	-	-	398	230	-	725	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	22.6	38.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	240	561	-	-	1134	-	-	138
HCM Lane V/C Ratio	0.149	0.008	-	-	0.012	-	-	0.228
HCM Control Delay (s)	22.6	11.5	0.1	-	8.2	0.2	-	38.6
HCM Lane LOS	C	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.8

Intersection

Int Delay, s/veh 6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	17	2	2	14	8	5	29	7	4	25	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	2	2	15	9	5	32	8	4	27	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	24	0	0	21	0	0	61	48	20	63	45	20
Stage 1	-	-	-	-	-	-	20	20	-	24	24	-
Stage 2	-	-	-	-	-	-	41	28	-	39	21	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1591	-	-	1595	-	-	934	844	1058	932	847	1058
Stage 1	-	-	-	-	-	-	999	879	-	994	875	-
Stage 2	-	-	-	-	-	-	974	872	-	976	878	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1591	-	-	1595	-	-	904	843	1058	898	846	1058
Mov Cap-2 Maneuver	-	-	-	-	-	-	904	843	-	898	846	-
Stage 1	-	-	-	-	-	-	999	879	-	994	874	-
Stage 2	-	-	-	-	-	-	936	871	-	934	878	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0		0.6		9.3		9.3
HCM LOS					A		A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	881	1591	-	-	1595	-	-	886
HCM Lane V/C Ratio	0.051	-	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	3	27	18	23	0	0	0	0	41	996	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	29	20	25	0	0	0	0	45	1083	24

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1197	1184	552	524	1196	0	0	0	0
Stage 1	1184	1184	-	0	0	-	-	-	-
Stage 2	13	0	-	524	1196	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	247	188	409	533	185	-	-	-	-
Stage 1	186	261	-	-	-	-	-	-	-
Stage 2	-	-	-	510	258	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	247	0	409	533	0	-	-	-	-
Mov Cap-2 Maneuver	247	0	-	533	0	-	-	-	-
Stage 1	186	0	-	-	0	-	-	-	-
Stage 2	-	0	-	510	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.6	-	-
HCM LOS	B	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	409	-	-	-
HCM Lane V/C Ratio	0.08	-	-	-
HCM Control Delay (s)	14.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection												
Int Delay, s/veh	0.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	23	0	0	6	19	35	1023	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	25	0	0	7	21	38	1112	22	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	524	1210	0	1212	1199	566	0	0	0
Stage 1	0	0	-	1199	1199	-	-	-	-
Stage 2	524	1210	-	13	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	533	181	-	243	184	400	-	-	-
Stage 1	-	-	-	182	257	-	-	-	-
Stage 2	510	254	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	533	0	-	243	0	400	-	-	-
Mov Cap-2 Maneuver	533	0	-	243	0	-	-	-	-
Stage 1	-	0	-	182	0	-	-	-	-
Stage 2	510	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		14.7	
HCM LOS	-	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	400
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	14.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	2	66	6	0	7	49	11	0	8	30	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	72	7	0	8	53	12	0	9	33	15
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.5	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	3%	10%	19%
Vol Thru, %	58%	89%	73%	66%
Vol Right, %	27%	8%	16%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	74	67	32
LT Vol	8	2	7	6
Through Vol	30	66	49	21
RT Vol	14	6	11	5
Lane Flow Rate	57	80	73	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.092	0.082	0.04
Departure Headway (Hd)	4.094	4.105	4.076	4.186
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	863	865	871	843
Service Time	2.175	2.165	2.139	2.272
HCM Lane V/C Ratio	0.066	0.092	0.084	0.042
HCM Control Delay	7.5	7.6	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: Existing Plus Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	52	1	1600	0.033	x	0.240	
NB Thru	991	3	4800	0.210			
NB Right	17	0	0	0.000			
SB Left	21	1	1600	0.013	x		0.075
SB Thru	982	3	4800	0.208			
SB Right	14	0	0	0.000			
EB Left	21	0	0	0.000	x	0.315	
EB Thru	12	1	1600	0.071			
EB Right	81	0	0	0.000			
WB Left	42	0	0	0.000	x		0.100
WB Thru	24	1	1600	0.075			
WB Right	54	0	0	0.000			
Sum of Critical V/C Ratios						0.315	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.415	
Level of Service (LOS) - Refer to table below						A	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: Existing Plus Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	248	2	2880	0.086	x	0.271
NB Thru	778	3	4800	0.175		
NB Right	64	0	0	0.000		
SB Left	125	2	2880	0.043	x	
SB Thru	805	3	4800	0.185		
SB Right	83	0	0	0.000		
EB Left	60	1	1600	0.038	x	0.333
EB Thru	247	2	3200	0.103		
EB Right	81	0	0	0.000		
WB Left	144	1	1600	0.090	x	
WB Thru	847	2	3200	0.296		
WB Right	100	0	0	0.000		
Sum of Critical V/C Ratios						0.605
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.705
Level of Service (LOS) - Refer to table below						C

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	936	33	15	665	23	10	4	36	2	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1017	36	16	723	25	11	4	39	2	5	9

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	748	0	0	1053	0	0	1463	1846	527	1309	1852	374
Stage 1	-	-	-	-	-	-	1066	1066	-	768	768	-
Stage 2	-	-	-	-	-	-	397	780	-	541	1084	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	856	-	-	657	-	-	90	74	496	117	73	623
Stage 1	-	-	-	-	-	-	237	297	-	360	409	-
Stage 2	-	-	-	-	-	-	600	404	-	493	291	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	856	-	-	657	-	-	78	68	496	96	67	623
Mov Cap-2 Maneuver	-	-	-	-	-	-	78	68	-	96	67	-
Stage 1	-	-	-	-	-	-	227	284	-	345	392	-
Stage 2	-	-	-	-	-	-	559	387	-	428	278	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	30.8	34.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	193	856	-	-	657	-	-	139
HCM Lane V/C Ratio	0.282	0.018	-	-	0.025	-	-	0.117
HCM Control Delay (s)	30.8	9.3	0.2	-	10.6	0.2	-	34.3
HCM Lane LOS	D	A	A	-	B	A	-	D
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	0.4

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	24	3	8	29	6	7	30	7	25	20	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	26	3	9	32	7	8	33	8	27	22	5

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	38	0	0	29	0	0	109	98	28	115	97	35
Stage 1	-	-	-	-	-	-	43	43	-	52	52	-
Stage 2	-	-	-	-	-	-	66	55	-	63	45	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1572	-	-	1584	-	-	870	792	1047	862	793	1038
Stage 1	-	-	-	-	-	-	971	859	-	961	852	-
Stage 2	-	-	-	-	-	-	945	849	-	948	857	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1572	-	-	1584	-	-	840	783	1047	822	784	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	840	783	-	822	784	-
Stage 1	-	-	-	-	-	-	966	855	-	956	847	-
Stage 2	-	-	-	-	-	-	910	844	-	901	853	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.4	9.6	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1572	-	-	1584	-	-	823
HCM Lane V/C Ratio	0.058	0.005	-	-	0.005	-	-	0.066
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	9	52	31	15	0	0	0	0	120	1353	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	57	34	16	0	0	0	0	130	1471	28

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1754	1746	748	854	1760	0	0	0	0
Stage 1	1746	1746	-	0	0	-	-	-	-
Stage 2	8	0	-	854	1760	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	127	85	305	367	84	-	-	-	-
Stage 1	83	139	-	-	-	-	-	-	-
Stage 2	-	-	-	342	136	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	127	0	305	367	0	-	-	-	-
Mov Cap-2 Maneuver	127	0	-	367	0	-	-	-	-
Stage 1	83	0	-	-	0	-	-	-	-
Stage 2	-	0	-	342	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	20.1	-	-
HCM LOS	C	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	305	-	-	-
HCM Lane V/C Ratio	0.217	-	-	-
HCM Control Delay (s)	20.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	86	31	0	0	13	17	36	1439	51	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	34	0	0	14	18	39	1564	55	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	711	1698	0	1687	1670	809	0	0	0
Stage 1	0	0	-	1670	1670	-	-	-	-
Stage 2	711	1698	-	17	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	432	91	-	137	95	278	-	-	-
Stage 1	-	-	-	92	151	-	-	-	-
Stage 2	407	146	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	432	0	-	137	0	278	-	-	-
Mov Cap-2 Maneuver	432	0	-	137	0	-	-	-	-
Stage 1	-	0	-	92	0	-	-	-	-
Stage 2	407	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		19.7	
HCM LOS	-	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	278
HCM Lane V/C Ratio	-	-	-	0.117
HCM Control Delay (s)	-	-	-	19.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	96	5	0	5	52	15	0	7	31	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	104	5	0	5	57	16	0	8	34	36
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	7.6	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	7%	52%
Vol Thru, %	44%	92%	72%	48%
Vol Right, %	46%	5%	21%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	104	72	31
LT Vol	7	3	5	16
Through Vol	31	96	52	15
RT Vol	33	5	15	0
Lane Flow Rate	77	113	78	34
Geometry Grp	1	1	1	1
Degree of Util (X)	0.089	0.131	0.089	0.043
Departure Headway (Hd)	4.136	4.165	4.103	4.542
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	849	859	793
Service Time	2.137	2.247	2.196	2.545
HCM Lane V/C Ratio	0.088	0.133	0.091	0.043
HCM Control Delay	7.5	7.9	7.6	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: Existing Plus Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	43	1	1600	0.027	x	0.327
NB Thru	1390	3	4800	0.302		
NB Right	58	0	0	0.000		
SB Left	41	1	1600	0.026	x	
SB Thru	1324	3	4800	0.282		
SB Right	30	0	0	0.000		
EB Left	40	0	0	0.000	x	0.094
EB Thru	47	1	1600	0.094		
EB Right	64	0	0	0.000		
WB Left	38	0	0	0.000	x	
WB Thru	17	1	1600	0.060		
WB Right	41	0	0	0.000		
Sum of Critical V/C Ratios						0.422
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.522
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: Existing Plus Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	257	2	2880	0.089	x	0.365
NB Thru	1138	3	4800	0.276		
NB Right	187	0	0	0.000		
SB Left	255	2	2880	0.089	x	
SB Thru	1134	3	4800	0.252		
SB Right	76	0	0	0.000		
EB Left	104	1	1600	0.065	x	0.364
EB Thru	764	2	3200	0.267		
EB Right	89	0	0	0.000		
WB Left	156	1	1600	0.098	x	
WB Thru	440	2	3200	0.164		
WB Right	84	0	0	0.000		
Sum of Critical V/C Ratios						0.729
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.829
Level of Service (LOS) - Refer to table below						D

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	389	3	13	1095	49	6	6	20	9	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	423	3	14	1190	53	7	7	22	10	7	15

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	1243	0	0	426	0	0	1060	1705	213	1468	1680	622
Stage 1	-	-	-	-	-	-	433	433	-	1245	1245	-
Stage 2	-	-	-	-	-	-	627	1272	-	223	435	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	556	-	-	1130	-	-	178	90	792	89	94	430
Stage 1	-	-	-	-	-	-	571	580	-	184	244	-
Stage 2	-	-	-	-	-	-	438	237	-	759	579	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	556	-	-	1130	-	-	156	86	792	78	89	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	86	-	78	89	-
Stage 1	-	-	-	-	-	-	566	575	-	182	234	-
Stage 2	-	-	-	-	-	-	394	227	-	723	574	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	22.5	39.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	240	556	-	-	1130	-	-	135
HCM Lane V/C Ratio	0.145	0.008	-	-	0.013	-	-	0.233
HCM Control Delay (s)	22.5	11.5	0.1	-	8.2	0.2	-	39.6
HCM Lane LOS	C	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.9

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	17	2	2	13	8	4	28	7	4	25	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	2	2	14	9	4	30	8	4	27	8

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	23	0	0	21	0	0	60	47	20	62	44	18
Stage 1	-	-	-	-	-	-	20	20	-	23	23	-
Stage 2	-	-	-	-	-	-	40	27	-	39	21	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1592	-	-	1595	-	-	936	845	1058	933	848	1061
Stage 1	-	-	-	-	-	-	999	879	-	995	876	-
Stage 2	-	-	-	-	-	-	975	873	-	976	878	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1592	-	-	1595	-	-	906	844	1058	900	847	1061
Mov Cap-2 Maneuver	-	-	-	-	-	-	906	844	-	900	847	-
Stage 1	-	-	-	-	-	-	999	879	-	995	875	-
Stage 2	-	-	-	-	-	-	937	872	-	935	878	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	9.3	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	882	1592	-	-	1595	-	-	888
HCM Lane V/C Ratio	0.048	-	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.2
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	2	24	18	22	0	0	0	0	41	1006	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	26	20	24	0	0	0	0	45	1093	24

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1207	1195	558	528	1207	0	0	0	0
Stage 1	1195	1195	-	0	0	-	-	-	-
Stage 2	12	0	-	528	1207	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	244	185	405	530	182	-	-	-	-
Stage 1	184	258	-	-	-	-	-	-	-
Stage 2	-	-	-	508	254	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	244	0	405	530	0	-	-	-	-
Mov Cap-2 Maneuver	244	0	-	530	0	-	-	-	-
Stage 1	184	0	-	-	0	-	-	-	-
Stage 2	-	0	-	508	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.6	-	-
HCM LOS	B	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	405	-	-	-
HCM Lane V/C Ratio	0.07	-	-	-
HCM Control Delay (s)	14.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	22	0	0	6	19	34	1033	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	24	0	0	7	21	37	1123	22	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	526	1218	0	1220	1208	571	0	0	0
Stage 1	0	0	-	1208	1208	-	-	-	-
Stage 2	526	1218	-	12	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	532	179	-	240	182	397	-	-	-
Stage 1	-	-	-	180	254	-	-	-	-
Stage 2	509	251	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	532	0	-	240	0	397	-	-	-
Mov Cap-2 Maneuver	532	0	-	240	0	-	-	-	-
Stage 1	-	0	-	180	0	-	-	-	-
Stage 2	509	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		14.7	
HCM LOS	-	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	397
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	14.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	2	67	6	0	7	49	10	0	8	30	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	73	7	0	8	53	11	0	9	33	15
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.5	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	3%	11%	17%
Vol Thru, %	58%	89%	74%	67%
Vol Right, %	27%	8%	15%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	75	66	30
LT Vol	8	2	7	5
Through Vol	30	67	49	20
RT Vol	14	6	10	5
Lane Flow Rate	57	82	72	33
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.093	0.081	0.038
Departure Headway (Hd)	4.092	4.101	4.081	4.175
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	863	867	869	845
Service Time	2.174	2.161	2.144	2.262
HCM Lane V/C Ratio	0.066	0.095	0.083	0.039
HCM Control Delay	7.5	7.6	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: 2017 Opening Year Pre-Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	52	1	1600	0.033	x	0.241	
NB Thru	1000	3	4800	0.212			
NB Right	17	0	0	0.000			
SB Left	21	1	1600	0.013	x		0.076
SB Thru	989	3	4800	0.209			
SB Right	14	0	0	0.000			
EB Left	21	0	0	0.000	x	0.317	
EB Thru	12	1	1600	0.071			
EB Right	80	0	0	0.000			
WB Left	42	0	0	0.000	x		0.100
WB Thru	24	1	1600	0.076			
WB Right	55	0	0	0.000			
Sum of Critical V/C Ratios						0.317	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.417	
Level of Service (LOS) - Refer to table below						A	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: 2017 Opening Year Pre-Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	250	2	2880	0.087	x	0.274
NB Thru	786	3	4800	0.177		
NB Right	65	0	0	0.000		
SB Left	126	2	2880	0.044	x	
SB Thru	813	3	4800	0.187		
SB Right	84	0	0	0.000		
EB Left	61	1	1600	0.038	x	0.337
EB Thru	249	2	3200	0.103		
EB Right	82	0	0	0.000		
WB Left	145	1	1600	0.091	x	
WB Thru	856	2	3200	0.299		
WB Right	101	0	0	0.000		
Sum of Critical V/C Ratios						0.611
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.711
Level of Service (LOS) - Refer to table below						C

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	945	32	14	672	23	9	4	36	2	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1027	35	15	730	25	10	4	39	2	5	9

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	755	0	0	1062	0	0	1473	1861	531	1319	1865	378
Stage 1	-	-	-	-	-	-	1075	1075	-	773	773	-
Stage 2	-	-	-	-	-	-	398	786	-	546	1092	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	851	-	-	652	-	-	88	72	493	115	72	620
Stage 1	-	-	-	-	-	-	234	294	-	358	407	-
Stage 2	-	-	-	-	-	-	599	401	-	490	289	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	851	-	-	652	-	-	76	66	493	94	66	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	66	-	94	66	-
Stage 1	-	-	-	-	-	-	224	281	-	343	391	-
Stage 2	-	-	-	-	-	-	559	385	-	425	277	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	30.4	35
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	194	851	-	-	652	-	-	136
HCM Lane V/C Ratio	0.275	0.018	-	-	0.023	-	-	0.12
HCM Control Delay (s)	30.4	9.3	0.2	-	10.7	0.2	-	35
HCM Lane LOS	D	A	A	-	B	A	-	E
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	0.4

Intersection												
Int Delay, s/veh	5.8											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	23	3	8	28	8	7	29	6	24	19	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	25	3	9	30	9	8	32	7	26	21	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	28	0	0	107	99	27	113	95	35
Stage 1	-	-	-	-	-	-	42	42	-	52	52	-
Stage 2	-	-	-	-	-	-	65	57	-	61	43	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1571	-	-	1585	-	-	872	791	1048	864	795	1038
Stage 1	-	-	-	-	-	-	972	860	-	961	852	-
Stage 2	-	-	-	-	-	-	946	847	-	950	859	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1571	-	-	1585	-	-	843	782	1048	825	786	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	843	782	-	825	786	-
Stage 1	-	-	-	-	-	-	967	856	-	956	847	-
Stage 2	-	-	-	-	-	-	913	842	-	905	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.3	9.6	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	822	1571	-	-	1585	-	-	826
HCM Lane V/C Ratio	0.056	0.005	-	-	0.005	-	-	0.063
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	8	52	31	12	0	0	0	0	121	1367	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	57	34	13	0	0	0	0	132	1486	28

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1770	1763	756	862	1777	0	0	0	0
Stage 1	1763	1763	-	0	0	-	-	-	-
Stage 2	7	0	-	862	1777	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	124	83	301	364	82	-	-	-	-
Stage 1	81	136	-	-	-	-	-	-	-
Stage 2	-	-	-	339	134	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	124	0	301	364	0	-	-	-	-
Mov Cap-2 Maneuver	124	0	-	364	0	-	-	-	-
Stage 1	81	0	-	-	0	-	-	-	-
Stage 2	-	0	-	339	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	20.2	-	-
HCM LOS	C	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	301	-	-	-
HCM Lane V/C Ratio	0.217	-	-	-
HCM Control Delay (s)	20.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	87	30	0	0	12	17	34	1453	52	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	33	0	0	13	18	37	1579	57	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	712	1710	0	1698	1682	817	0	0	0
Stage 1	0	0	-	1682	1682	-	-	-	-
Stage 2	712	1710	-	16	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	432	90	-	136	94	274	-	-	-
Stage 1	-	-	-	91	149	-	-	-	-
Stage 2	407	144	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	432	0	-	136	0	274	-	-	-
Mov Cap-2 Maneuver	432	0	-	136	0	-	-	-	-
Stage 1	-	0	-	91	0	-	-	-	-
Stage 2	407	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		19.8	
HCM LOS	-	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	274
HCM Lane V/C Ratio	-	-	-	0.115
HCM Control Delay (s)	-	-	-	19.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	97	5	0	5	53	13	0	7	30	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	105	5	0	5	58	14	0	8	33	36
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	7.6	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	7%	50%
Vol Thru, %	43%	92%	75%	50%
Vol Right, %	47%	5%	18%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	105	71	30
LT Vol	7	3	5	15
Through Vol	30	97	53	15
RT Vol	33	5	13	0
Lane Flow Rate	76	114	77	33
Geometry Grp	1	1	1	1
Degree of Util (X)	0.087	0.132	0.088	0.041
Departure Headway (Hd)	4.131	4.16	4.115	4.538
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	873	851	857	793
Service Time	2.132	2.238	2.204	2.54
HCM Lane V/C Ratio	0.087	0.134	0.09	0.042
HCM Control Delay	7.5	7.9	7.6	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: 2017 Opening Year Pre-Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	40	1	1600	0.025	x	0.330
NB Thru	1402	3	4800	0.304		
NB Right	59	0	0	0.000		
SB Left	41	1	1600	0.026	x	
SB Thru	1336	3	4800	0.285		
SB Right	30	0	0	0.000		
EB Left	40	0	0	0.000	x	0.094
EB Thru	47	1	1600	0.094		
EB Right	64	0	0	0.000		
WB Left	38	0	0	0.000	x	
WB Thru	17	1	1600	0.060		
WB Right	41	0	0	0.000		
Sum of Critical V/C Ratios						0.424
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.524
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: 2017 Opening Year Pre-Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	260	2	2880	0.090	x	0.368
NB Thru	1149	3	4800	0.279		
NB Right	189	0	0	0.000		
SB Left	258	2	2880	0.090	x	
SB Thru	1145	3	4800	0.254		
SB Right	76	0	0	0.000		
EB Left	105	1	1600	0.066	x	0.368
EB Thru	772	2	3200	0.269		
EB Right	90	0	0	0.000		
WB Left	158	1	1600	0.099	x	
WB Thru	444	2	3200	0.165		
WB Right	85	0	0	0.000		
Sum of Critical V/C Ratios						0.736
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.836
Level of Service (LOS) - Refer to table below						D

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection													
Int Delay, s/veh	1.4												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	389	3	13	1095	49	7	6	20	9	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	423	3	14	1190	53	8	7	22	10	7	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1243	0	0	426	0	0	1060	1705	213	1468	1680	622
Stage 1	-	-	-	-	-	-	433	433	-	1245	1245	-
Stage 2	-	-	-	-	-	-	627	1272	-	223	435	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	556	-	-	1130	-	-	178	90	792	89	94	430
Stage 1	-	-	-	-	-	-	571	580	-	184	244	-
Stage 2	-	-	-	-	-	-	438	237	-	759	579	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	556	-	-	1130	-	-	156	86	792	78	89	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	86	-	78	89	-
Stage 1	-	-	-	-	-	-	566	575	-	182	234	-
Stage 2	-	-	-	-	-	-	394	227	-	723	574	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	23	39.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	236	556	-	-	1130	-	-	135
HCM Lane V/C Ratio	0.152	0.008	-	-	0.013	-	-	0.233
HCM Control Delay (s)	23	11.5	0.1	-	8.2	0.2	-	39.6
HCM Lane LOS	C	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.9

Intersection

Int Delay, s/veh 6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	17	2	2	14	8	5	29	7	4	25	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	2	2	15	9	5	32	8	4	27	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	24	0	0	21	0	0	61	48	20	63	45	20
Stage 1	-	-	-	-	-	-	20	20	-	24	24	-
Stage 2	-	-	-	-	-	-	41	28	-	39	21	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1591	-	-	1595	-	-	934	844	1058	932	847	1058
Stage 1	-	-	-	-	-	-	999	879	-	994	875	-
Stage 2	-	-	-	-	-	-	974	872	-	976	878	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1591	-	-	1595	-	-	904	843	1058	898	846	1058
Mov Cap-2 Maneuver	-	-	-	-	-	-	904	843	-	898	846	-
Stage 1	-	-	-	-	-	-	999	879	-	994	874	-
Stage 2	-	-	-	-	-	-	936	871	-	934	878	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	9.3	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	881	1591	-	-	1595	-	-	886
HCM Lane V/C Ratio	0.051	-	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	3	27	18	23	0	0	0	0	41	1006	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	29	20	25	0	0	0	0	45	1093	24

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1208	1195	558	528	1207	0	0	0	0
Stage 1	1195	1195	-	0	0	-	-	-	-
Stage 2	13	0	-	528	1207	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	244	185	405	530	182	-	-	-	-
Stage 1	184	258	-	-	-	-	-	-	-
Stage 2	-	-	-	508	254	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	244	0	405	530	0	-	-	-	-
Mov Cap-2 Maneuver	244	0	-	530	0	-	-	-	-
Stage 1	184	0	-	-	0	-	-	-	-
Stage 2	-	0	-	508	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.7	-	-
HCM LOS	B	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	405	-	-	-
HCM Lane V/C Ratio	0.081	-	-	-
HCM Control Delay (s)	14.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	23	0	0	6	19	35	1033	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	25	0	0	7	21	38	1123	22	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	528	1221	0	1223	1210	571	0	0	0
Stage 1	0	0	-	1210	1210	-	-	-	-
Stage 2	528	1221	-	13	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	530	179	-	239	181	397	-	-	-
Stage 1	-	-	-	180	254	-	-	-	-
Stage 2	508	251	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	530	0	-	239	0	397	-	-	-
Mov Cap-2 Maneuver	530	0	-	239	0	-	-	-	-
Stage 1	-	0	-	180	0	-	-	-	-
Stage 2	508	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		14.7	
HCM LOS	-	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	397
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	14.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	2	67	6	0	7	49	11	0	8	30	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	73	7	0	8	53	12	0	9	33	15
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.5	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	3%	10%	18%
Vol Thru, %	58%	89%	73%	64%
Vol Right, %	27%	8%	16%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	75	67	33
LT Vol	8	2	7	6
Through Vol	30	67	49	21
RT Vol	14	6	11	6
Lane Flow Rate	57	82	73	36
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.093	0.083	0.042
Departure Headway (Hd)	4.097	4.107	4.079	4.171
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	862	864	870	846
Service Time	2.181	2.17	2.144	2.259
HCM Lane V/C Ratio	0.066	0.095	0.084	0.043
HCM Control Delay	7.5	7.6	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: 2017 Opening Year With Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	53	1	1600	0.033	x	0.243
NB Thru	1001	3	4800	0.212		
NB Right	17	0	0	0.000		
SB Left	21	1	1600	0.013	x	
SB Thru	992	3	4800	0.210		
SB Right	14	0	0	0.000		
EB Left	21	0	0	0.000	x	0.076
EB Thru	12	1	1600	0.072		
EB Right	82	0	0	0.000		
WB Left	42	0	0	0.000	x	
WB Thru	24	1	1600	0.076		
WB Right	55	0	0	0.000		
Sum of Critical V/C Ratios						0.318
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.418
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: 2017 Opening Year With Project	Peak Hour: AM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	250	2	2880	0.087	x	0.274
NB Thru	786	3	4800	0.177		
NB Right	65	0	0	0.000		
SB Left	126	2	2880	0.044	x	
SB Thru	813	3	4800	0.187		
SB Right	84	0	0	0.000		
EB Left	61	1	1600	0.038	x	0.337
EB Thru	249	2	3200	0.103		
EB Right	82	0	0	0.000		
WB Left	145	1	1600	0.091	x	
WB Thru	856	2	3200	0.299		
WB Right	101	0	0	0.000		
Sum of Critical V/C Ratios						0.611
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.711
Level of Service (LOS) - Refer to table below						C

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	945	33	15	672	23	10	4	36	2	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1027	36	16	730	25	11	4	39	2	5	9

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	755	0	0	1063	0	0	1477	1864	532	1322	1869	378
Stage 1	-	-	-	-	-	-	1076	1076	-	776	776	-
Stage 2	-	-	-	-	-	-	401	788	-	546	1093	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	851	-	-	651	-	-	88	72	492	114	72	620
Stage 1	-	-	-	-	-	-	234	294	-	356	406	-
Stage 2	-	-	-	-	-	-	597	400	-	490	288	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	851	-	-	651	-	-	76	66	492	93	66	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	66	-	93	66	-
Stage 1	-	-	-	-	-	-	224	281	-	341	389	-
Stage 2	-	-	-	-	-	-	555	383	-	425	276	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	31.8	35
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	188	851	-	-	651	-	-	136
HCM Lane V/C Ratio	0.289	0.018	-	-	0.025	-	-	0.12
HCM Control Delay (s)	31.8	9.3	0.2	-	10.7	0.2	-	35
HCM Lane LOS	D	A	A	-	B	A	-	E
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	0.4

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	24	3	8	29	6	7	30	7	25	20	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	26	3	9	32	7	8	33	8	27	22	5

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	38	0	0	29	0	0	109	98	28	115	97	35
Stage 1	-	-	-	-	-	-	43	43	-	52	52	-
Stage 2	-	-	-	-	-	-	66	55	-	63	45	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1572	-	-	1584	-	-	870	792	1047	862	793	1038
Stage 1	-	-	-	-	-	-	971	859	-	961	852	-
Stage 2	-	-	-	-	-	-	945	849	-	948	857	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1572	-	-	1584	-	-	840	783	1047	822	784	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	840	783	-	822	784	-
Stage 1	-	-	-	-	-	-	966	855	-	956	847	-
Stage 2	-	-	-	-	-	-	910	844	-	901	853	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.4	9.6	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1572	-	-	1584	-	-	823
HCM Lane V/C Ratio	0.058	0.005	-	-	0.005	-	-	0.066
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	9	53	31	15	0	0	0	0	121	1367	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	58	34	16	0	0	0	0	132	1486	28

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1771	1763	756	862	1777	0	0	0	0
Stage 1	1763	1763	-	0	0	-	-	-	-
Stage 2	8	0	-	862	1777	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	124	83	301	364	82	-	-	-	-
Stage 1	81	136	-	-	-	-	-	-	-
Stage 2	-	-	-	339	134	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	124	0	301	364	0	-	-	-	-
Mov Cap-2 Maneuver	124	0	-	364	0	-	-	-	-
Stage 1	81	0	-	-	0	-	-	-	-
Stage 2	-	0	-	339	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	20.4	-	-
HCM LOS	C	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	301	-	-	-
HCM Lane V/C Ratio	0.224	-	-	-
HCM Control Delay (s)	20.4	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	87	31	0	0	13	17	36	1453	52	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	34	0	0	14	18	39	1579	57	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	717	1714	0	1703	1686	817	0	0	0
Stage 1	0	0	-	1686	1686	-	-	-	-
Stage 2	717	1714	-	17	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	429	89	-	135	93	274	-	-	-
Stage 1	-	-	-	90	149	-	-	-	-
Stage 2	404	144	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	429	0	-	135	0	274	-	-	-
Mov Cap-2 Maneuver	429	0	-	135	0	-	-	-	-
Stage 1	-	0	-	90	0	-	-	-	-
Stage 2	404	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		19.9	
HCM LOS	-	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	274
HCM Lane V/C Ratio	-	-	-	0.119
HCM Control Delay (s)	-	-	-	19.9
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	97	5	0	5	53	15	0	7	31	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	105	5	0	5	58	16	0	8	34	36
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	7.6	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	7%	52%
Vol Thru, %	44%	92%	73%	48%
Vol Right, %	46%	5%	21%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	105	73	31
LT Vol	7	3	5	16
Through Vol	31	97	53	15
RT Vol	33	5	15	0
Lane Flow Rate	77	114	79	34
Geometry Grp	1	1	1	1
Degree of Util (X)	0.089	0.132	0.09	0.043
Departure Headway (Hd)	4.139	4.166	4.105	4.546
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	849	859	792
Service Time	2.141	2.248	2.198	2.549
HCM Lane V/C Ratio	0.088	0.134	0.092	0.043
HCM Control Delay	7.5	7.9	7.6	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	
Scenario: 2017 Opening Year With Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	42	1	1600	0.026	x	0.330
NB Thru	1404	3	4800	0.305		
NB Right	59	0	0	0.000		
SB Left	41	1	1600	0.026	x	
SB Thru	1337	3	4800	0.285		
SB Right	30	0	0	0.000		
EB Left	40	0	0	0.000	x	0.095
EB Thru	47	1	1600	0.095		
EB Right	65	0	0	0.000		
WB Left	38	0	0	0.000	x	
WB Thru	17	1	1600	0.060		
WB Right	41	0	0	0.000		
Sum of Critical V/C Ratios						0.425
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.525
Level of Service (LOS) - Refer to table below						A

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	
Scenario: 2017 Opening Year With Project	Peak Hour: PM
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	260	2	2880	0.090	x	0.368
NB Thru	1149	3	4800	0.279		
NB Right	189	0	0	0.000		
SB Left	258	2	2880	0.090	x	
SB Thru	1145	3	4800	0.255		
SB Right	77	0	0	0.000		
EB Left	105	1	1600	0.066	x	0.368
EB Thru	772	2	3200	0.269		
EB Right	90	0	0	0.000		
WB Left	158	1	1600	0.099	x	
WB Thru	444	2	3200	0.165		
WB Right	85	0	0	0.000		
Sum of Critical V/C Ratios						0.736
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.836
Level of Service (LOS) - Refer to table below						D

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection												
Int Delay, s/veh	1.4											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	389	3	13	1095	49	7	6	20	9	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	423	3	14	1190	53	8	7	22	10	7	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1243	0	0	426	0	0	1060	1705	213	1468	1680	622
Stage 1	-	-	-	-	-	-	433	433	-	1245	1245	-
Stage 2	-	-	-	-	-	-	627	1272	-	223	435	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	556	-	-	1130	-	-	178	90	792	89	94	430
Stage 1	-	-	-	-	-	-	571	580	-	184	244	-
Stage 2	-	-	-	-	-	-	438	237	-	759	579	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	556	-	-	1130	-	-	156	86	792	78	89	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	86	-	78	89	-
Stage 1	-	-	-	-	-	-	566	575	-	182	234	-
Stage 2	-	-	-	-	-	-	394	227	-	723	574	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	23	39.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	236	556	-	-	1130	-	-	135
HCM Lane V/C Ratio	0.152	0.008	-	-	0.013	-	-	0.233
HCM Control Delay (s)	23	11.5	0.1	-	8.2	0.2	-	39.6
HCM Lane LOS	C	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.9

Intersection

Int Delay, s/veh 6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	17	2	2	14	8	5	29	7	4	25	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	2	2	15	9	5	32	8	4	27	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	24	0	0	21	0	0	61	48	20	63	45	20
Stage 1	-	-	-	-	-	-	20	20	-	24	24	-
Stage 2	-	-	-	-	-	-	41	28	-	39	21	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1591	-	-	1595	-	-	934	844	1058	932	847	1058
Stage 1	-	-	-	-	-	-	999	879	-	994	875	-
Stage 2	-	-	-	-	-	-	974	872	-	976	878	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1591	-	-	1595	-	-	904	843	1058	898	846	1058
Mov Cap-2 Maneuver	-	-	-	-	-	-	904	843	-	898	846	-
Stage 1	-	-	-	-	-	-	999	879	-	994	874	-
Stage 2	-	-	-	-	-	-	936	871	-	934	878	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0		0.6		9.3		9.3
HCM LOS					A		A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	881	1591	-	-	1595	-	-	886
HCM Lane V/C Ratio	0.051	-	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	3	27	18	23	0	0	0	0	41	1010	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	29	20	25	0	0	0	0	45	1098	24

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1212	1199	560	530	1211	0	0	0	0
Stage 1	1199	1199	-	0	0	-	-	-	-
Stage 2	13	0	-	530	1211	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	243	184	404	529	181	-	-	-	-
Stage 1	182	257	-	-	-	-	-	-	-
Stage 2	-	-	-	506	253	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	243	0	404	529	0	-	-	-	-
Mov Cap-2 Maneuver	243	0	-	529	0	-	-	-	-
Stage 1	182	0	-	-	0	-	-	-	-
Stage 2	-	0	-	506	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.7	-	-
HCM LOS	B	-	-

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	404	-	-	-	-
HCM Lane V/C Ratio	0.081	-	-	-	-
HCM Control Delay (s)	14.7	-	-	-	-
HCM Lane LOS	B	-	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	23	0	0	6	19	35	1035	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	25	0	0	7	21	38	1125	22	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	529	1223	0	1225	1212	572	0	0	0
Stage 1	0	0	-	1212	1212	-	-	-	-
Stage 2	529	1223	-	13	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	530	178	-	239	181	397	-	-	-
Stage 1	-	-	-	179	253	-	-	-	-
Stage 2	507	250	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-
Mov Cap-1 Maneuver	530	0	-	239	0	397	-	-	-
Mov Cap-2 Maneuver	530	0	-	239	0	-	-	-	-
Stage 1	-	0	-	179	0	-	-	-	-
Stage 2	507	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		14.7	
HCM LOS	-	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	397
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	14.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	2	67	6	0	7	49	11	0	8	30	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	73	7	0	8	53	12	0	9	33	15
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.5	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	3%	10%	18%
Vol Thru, %	58%	89%	73%	64%
Vol Right, %	27%	8%	16%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	75	67	33
LT Vol	8	2	7	6
Through Vol	30	67	49	21
RT Vol	14	6	11	6
Lane Flow Rate	57	82	73	36
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.093	0.083	0.042
Departure Headway (Hd)	4.097	4.107	4.079	4.171
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	862	864	870	846
Service Time	2.181	2.17	2.144	2.259
HCM Lane V/C Ratio	0.066	0.095	0.084	0.043
HCM Control Delay	7.5	7.6	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	Peak Hour: AM
Scenario: 2017 Opening Year With Project Plus Cumulative Projects	
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	53	1	1600	0.033	x	0.244	
NB Thru	1003	3	4800	0.213			
NB Right	17	0	0	0.000			
SB Left	21	1	1600	0.013	x		0.076
SB Thru	996	3	4800	0.210			
SB Right	14	0	0	0.000			
EB Left	21	0	0	0.000	x	0.319	
EB Thru	12	1	1600	0.072			
EB Right	82	0	0	0.000			
WB Left	42	0	0	0.000	x		0.419
WB Thru	24	1	1600	0.076			
WB Right	55	0	0	0.000			
Sum of Critical V/C Ratios						0.319	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.419	
Level of Service (LOS) - Refer to table below						A	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	Peak Hour: AM
Scenario: 2017 Opening Year With Project Plus Cumulative Projects	
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	250	2	2880	0.087	x	0.275	
NB Thru	788	3	4800	0.178			
NB Right	65	0	0	0.000			
SB Left	126	2	2880	0.044	x		0.337
SB Thru	817	3	4800	0.188			
SB Right	84	0	0	0.000			
EB Left	61	1	1600	0.038	x	0.612	
EB Thru	249	2	3200	0.103			
EB Right	82	0	0	0.000			
WB Left	145	1	1600	0.091	x		0.712
WB Thru	856	2	3200	0.299			
WB Right	101	0	0	0.000			
Sum of Critical V/C Ratios						0.612	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.712	
Level of Service (LOS) - Refer to table below						C	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

Intersection													
Int Delay, s/veh	1.5												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	14	945	33	15	672	23	10	4	36	2	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1027	36	16	730	25	11	4	39	2	5	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	755	0	0	1063	0	0	1477	1864	532	1322	1869	378
Stage 1	-	-	-	-	-	-	1076	1076	-	776	776	-
Stage 2	-	-	-	-	-	-	401	788	-	546	1093	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	851	-	-	651	-	-	88	72	492	114	72	620
Stage 1	-	-	-	-	-	-	234	294	-	356	406	-
Stage 2	-	-	-	-	-	-	597	400	-	490	288	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	851	-	-	651	-	-	76	66	492	93	66	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	66	-	93	66	-
Stage 1	-	-	-	-	-	-	224	281	-	341	389	-
Stage 2	-	-	-	-	-	-	555	383	-	425	276	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	31.8	35
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	188	851	-	-	651	-	-	136
HCM Lane V/C Ratio	0.289	0.018	-	-	0.025	-	-	0.12
HCM Control Delay (s)	31.8	9.3	0.2	-	10.7	0.2	-	35
HCM Lane LOS	D	A	A	-	B	A	-	E
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	0.4

Intersection												
Int Delay, s/veh	6											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	24	3	8	29	6	7	30	7	25	20	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	26	3	9	32	7	8	33	8	27	22	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	38	0	0	29	0	0	109	98	28	115	97	35
Stage 1	-	-	-	-	-	-	43	43	-	52	52	-
Stage 2	-	-	-	-	-	-	66	55	-	63	45	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1572	-	-	1584	-	-	870	792	1047	862	793	1038
Stage 1	-	-	-	-	-	-	971	859	-	961	852	-
Stage 2	-	-	-	-	-	-	945	849	-	948	857	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1572	-	-	1584	-	-	840	783	1047	822	784	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	840	783	-	822	784	-
Stage 1	-	-	-	-	-	-	966	855	-	956	847	-
Stage 2	-	-	-	-	-	-	910	844	-	901	853	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.4	9.6	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1572	-	-	1584	-	-	823
HCM Lane V/C Ratio	0.058	0.005	-	-	0.005	-	-	0.066
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	9	53	31	15	0	0	0	0	121	1369	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	58	34	16	0	0	0	0	132	1488	28

Major/Minor	Minor2			Minor1			Major2		
Conflicting Flow All	1773	1765	757	863	1779	0	0	0	0
Stage 1	1765	1765	-	0	0	-	-	-	-
Stage 2	8	0	-	863	1779	-	-	-	-
Critical Hdwy	5.74	6.54	7.14	5.74	6.54	-	-	-	-
Critical Hdwy Stg 1	6.64	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	-	-	-	-
Pot Cap-1 Maneuver	124	83	300	363	81	-	-	-	-
Stage 1	80	136	-	-	-	-	-	-	-
Stage 2	-	-	-	338	133	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	124	0	300	363	0	-	-	-	-
Mov Cap-2 Maneuver	124	0	-	363	0	-	-	-	-
Stage 1	80	0	-	-	0	-	-	-	-
Stage 2	-	0	-	338	0	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	20.4	-	-
HCM LOS	C	-	-

Minor Lane/Major Mvmt	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	300	-	-	-
HCM Lane V/C Ratio	0.225	-	-	-
HCM Control Delay (s)	20.4	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-

Intersection													
Int Delay, s/veh	0.4												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	87	31	0	0	13	17	36	1457	52	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	34	0	0	14	18	39	1584	57	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	719	1718	0	1707	1690	819	0	0	0
Stage 1	0	0	-	1690	1690	-	-	-	-
Stage 2	719	1718	-	17	0	-	-	-	-
Critical Hdwy	5.74	6.54	-	5.74	6.54	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	3.82	4.02	3.92	-	-	-
Pot Cap-1 Maneuver	428	89	-	134	92	273	-	-	-
Stage 1	-	-	-	90	148	-	-	-	-
Stage 2	403	143	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	428	0	-	134	0	273	-	-	-
Mov Cap-2 Maneuver	428	0	-	134	0	-	-	-	-
Stage 1	-	0	-	90	0	-	-	-	-
Stage 2	403	0	-	-	0	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	-	20	-
HCM LOS	-	C	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	-	-	-	273
HCM Lane V/C Ratio	-	-	-	0.119
HCM Control Delay (s)	-	-	-	20
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	97	5	0	5	53	15	0	7	31	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	105	5	0	5	58	16	0	8	34	36
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	7.6	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	7%	52%
Vol Thru, %	44%	92%	73%	48%
Vol Right, %	46%	5%	21%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	105	73	31
LT Vol	7	3	5	16
Through Vol	31	97	53	15
RT Vol	33	5	15	0
Lane Flow Rate	77	114	79	34
Geometry Grp	1	1	1	1
Degree of Util (X)	0.089	0.132	0.09	0.043
Departure Headway (Hd)	4.139	4.166	4.105	4.546
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	849	859	792
Service Time	2.141	2.248	2.198	2.549
HCM Lane V/C Ratio	0.088	0.134	0.092	0.043
HCM Control Delay	7.5	7.9	7.6	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.3	0.1

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & 154th Street	Peak Hour: PM
Scenario: 2017 Opening Year With Project Plus Cumulative Projects	
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	42	1	1600	0.026	x	0.331	
NB Thru	1408	3	4800	0.306			
NB Right	59	0	0	0.000			
SB Left	41	1	1600	0.026	x		0.331
SB Thru	1339	3	4800	0.285			
SB Right	30	0	0	0.000			
EB Left	40	0	0	0.000	x	0.095	
EB Thru	47	1	1600	0.095			
EB Right	65	0	0	0.000			
WB Left	38	0	0	0.000	x		0.095
WB Thru	17	1	1600	0.060			
WB Right	41	0	0	0.000			
Sum of Critical V/C Ratios						0.426	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.526	
Level of Service (LOS) - Refer to table below						A	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection: Hawthorne Boulevard & Marine Avenue	Peak Hour: PM
Scenario: 2017 Opening Year With Project Plus Cumulative Projects	
Analyst: NS	Agency: City of Lawndale

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total	
NB Left	260	2	2880	0.090	x	0.369	
NB Thru	1153	3	4800	0.280			
NB Right	189	0	0	0.000			
SB Left	258	2	2880	0.090	x		0.369
SB Thru	1147	3	4800	0.255			
SB Right	77	0	0	0.000			
EB Left	105	1	1600	0.066	x	0.368	
EB Thru	772	2	3200	0.269			
EB Right	90	0	0	0.000			
WB Left	158	1	1600	0.099	x		0.368
WB Thru	444	2	3200	0.165			
WB Right	85	0	0	0.000			
Sum of Critical V/C Ratios						0.737	
Adjustment for Lost Time						0.100	
Intersection Capacity Utilization (ICU)						0.837	
Level of Service (LOS) - Refer to table below						D	

Notes:	Comments:	LOS	Maximum V/C Ratio
1. Per lane Capacity = 1,600 VPH		A	0.6
2. Dual turn lane Capacity = 2,880 VPH		B	0.7
3. Intersection Type: 4-Way X		C	0.8
T		D	0.9
Split N/S		E	1.0
Split E/W		F	n/a