300 Studebaker Road Industrial Park Project

Final Initial Study – Mitigated Negative Declaration

prepared by

City of Long Beach
Planning Bureau, Department of Development Services
411 West Ocean Boulevard, 3rd Floor
Long Beach, California 90802
Contact: Maryanne Cronin, Planner

prepared with the assistance of

Rincon Consultants, Inc.
250 East 1st Street, Suite 1400
Los Angeles, California 90012

November 2019

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

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1 Responses to Comments on the IS-MND

This section includes comments received during the circulation of the Draft Initial Study-Mitigated Negative Declaration (IS-MND) prepared for the 300 Studebaker Road Industrial Park Project (Project).

The Draft IS-MND was circulated for a 30-day public review period that began on September 6, 2019 and ended on October 7, 2019. The City of Long Beach received six comment letters on the Draft IS-MND. The commenters and the page number on which each commenter's letter appear are listed below.

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7	John Fries, President, Los Cerritos Wetlands Land Trust	1-26

The comment letters and responses follow. The comment letters have been numbered sequentially and each separate issue raised by the commenter, if more than one, has been assigned a number. The responses to each comment identify first the number of the comment letter, and then the number assigned to each issue (Response 1.1, for example, indicates that the response is for the first issue raised in comment Letter 1).

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
301 E Ocean Blvd, Suite 300
Long Beach, CA 90802
(562) 590-5071

Letter 1

October 7, 2019

City of Long Beach, Development Services Department
Attn: Maryanne Cronin, City Planner
411 W. Ocean Boulevard, 3rd floor
Long Beach, CA 90802

RE: 300 Studebaker Road Industrial Park Project Notice of Mitigated Negative Declaration Coastal Commission Staff Comments on MND

Maryanne Cronin:

Thank you for the invitation to comment on the City of Long Beach's (City's) intent to adopt a Mitigated Negative Declaration (MND) for the 300 Studebaker Road Industrial Park Project. In Long Beach, the requirements of the California Coastal Act are met through compliance with the certified Local Coastal Plan (LCP). The City will process a local coastal development permit for the proposed project under the provisions of the certified LCP. The majority of the proposed project site is located within the coastal zone in the Southeast Area Development and Improvement Plan (SEADIP) area, Subareas 19 and 24, as stated in the MND. Three of the subject parcels (APNs: 7237-017-007, 7237-017-008, and 7237-017-009) located within SEADIP Subarea 24 South, are in the appealable area of the City's coastal development permit jurisdiction area. Therefore, the City's final action on the required local coastal development permit can be appealed to the Coastal Commission. The City's action on the local coastal development permit may be appealed to the Commission on the grounds that the approved development does not conform to the policies and standards of the certified LCP.

Per Section 21.25.904.C of the City's certified zoning code [a segment of the City's Implementation Plan (IP) portion of the certified Local Coastal Program (LCP)], in order to approve a local CDP, the City must find that the proposed development conforms to the certified LCP, which includes but is not limited to the Local Coastal Plan, Open Space and Recreation Element, Zoning Code, and SEADIP, as certified by the Commission. While the MND did include analysis of the proposed project's conformance with the LCP, Commission staff suggests also addressing the following issues, at a minimum. Additionally, a more thorough review of SEADIP and the LCP in its entirety is recommended.

A. **Open Space Dedication.** The subject project includes a proposal to change the use of two undeveloped areas between Studebaker Road and the Cerritos Channel from Industrial to Open Space and update the City's Land Use Plan.

i. The City's Local Coastal Plan includes a Park Dedication Policy that states: "*Properties in the coastal zone not now developed as parks but which at some future time become public park lands shall be dedicated in perpetuity at the time they become parklands*". The proposed project must be found to be consistent with the certified Local Coastal Plan, which includes the park dedication policy. In addition, the City should consider amending the LCP, including but not limited to the Local Coastal Plan, Zoning Code, and Open Space and Recreation Element to update the park and land use designations, maps, and lists to include the new proposed open 1.1 1.2

-2

space areas. The proposed project must also be found to be consistent with the aforementioned LCP elements. 1.2 (cont'd)

ii. *SEADIP* – Policy (b) of Subarea 24 states: "*Area 24 South is to be developed as an overlook area and interpretive center for the bordering marsh*". Policy (c) of Subarea 24 states: "*Area 24 North shall be dedicated to the City of Long Beach for park and playground purposes*". The proposed project must be found to be consistent with these policies of the certified LCP or the City can request to amend the LCP prior to approval of the proposed project so that the project conforms to the policies of the LCP. 1.3

B. **Coastal Hazards.** Land Use Policy 9 of SEADIP requires all development to minimize risks to life and property in hazardous areas, including those at risk for flooding hazards. Upon initial review, it appears that the project site may be subject to substantial flooding under normal conditions (no severe storms) and a medium-high risk aversion scenario around 2080, which may be within the anticipated lifetime of the structure. The MND should call out the anticipated life of the structure. Additionally, the MND should does not discuss the proposed project's vulnerability to hazards and identify alternatives, design elements, and adaptation strategies that may be included in the project. In order to be found consistent with the City's LCP, the City should carefully analyze the hazards that may affect the project site, including flood hazards exacerbated by sea level rise, and ensure the proposed project is designed and conditioned to minimize risks to life and property. 1.4

Please note that the comments provided herein are preliminary in nature. More specific comments may be appropriate as the project develops. Additionally, as mentioned in the MND, the Commission has not yet heard and acted on the City's LCP amendment request, which includes the City's proposal to replace SEADIP with the Southeast Area Specific Plan (SEASP). If the LCP amendment is certified by the Commission prior to the City's processing of the local CDP, then the project must be found to be consistent with SEASP and the rest of the LCP in order for the project to be approved. Coastal Commission staff requests notification of any future activity associated with this project or related projects. Thank you for the opportunity to comment on the MND. Please feel free to contact me at (562) 590-5071 with any questions. 1.5

Sincerely,

Dani Ziff
Coastal Program Analyst

cc: Christopher Koontz, City of Long Beach
Zach Rehm, California Coastal Commission
Steve Hudson, California Coastal Commission

Letter 1

COMMENTER: Dani Ziff, Coastal Program Analyst, California Coastal Commission

DATE: October 7, 2019

The commenter states that three of the subject parcels in the project site are located within the coastal zone in the Southeast Area Development and Improvement Plan (SEADIP) area; therefore, the City of Long Beach's final action on the local coastal development permit may be appealed to the California Coastal Commission (CCC) if the approved development does not conform to the policies and standards of the Local Coastal Plan (LCP). The CCC recommends a more thorough review of the project's conformance with SEADIP and the LCP than was presented in the IS-MND. Specific points of examination are labeled as responses below:

Response 1.1

The commenter states that project must be found to be consistent with the LCP's Park Dedication Policy, which states that properties within the coastal zone not currently developed as parks, but may become public park lands at a future time, shall be dedicated in perpetuity at the time they become parklands.

The commenter also states that the City should consider amending the LCP, including the Zoning Code, and Open Space and Recreation Element to update the park and land use designations, maps, and lists to include the new proposed open space areas. The project must be consistent with those changes.

Thank you for your comment. The proposed open space area on the west side of Studebaker Road that are included in the project boundaries will be dedicated to the Los Cerritos Wetlands Authority (LCWA), or designated state or City of Long Beach agency. The LCWA is a joint powers authority made up of the State Coastal Conservancy, the Rivers and Mountains Conservancy and the cities of Long Beach and Seal Beach and currently owns approximately 170 acres of Los Cerritos Wetlands. The dedication of these parcels to the LCWA, or designated agency, would constitute a transference of land to an authority for the purpose of conservation and preservation of open space, which is the intent of the provisions listed under the SEADIP for Subarea 24. These areas will undergo native plant restoration in consultation with the LCWA (please refer to Response 4.1, below). While the areas would not presently be dedicated as parkland, the open space designation is consistent with the intent for SEADIP Subarea 24 and the underlying Land Use Designation (LUD No. 7 – Mixed Uses) allows for recreation, including passive recreation, as a permitted land use.

Response 1.2

The commenter also states that the project must be consistent with SEADIP plans for Subareas 24 South and North, which designate an overlook area and interpretive center, and a park and playground, respectively. Alternatively, the City can request to amend the LCP prior to approval of the project.

SEADIP Subarea 24 calls for the dedication of open space in the form of an overlook and interpretive center and a park and playground. As part of pending submittals to the California Coastal Commission (CCC) for the approval of the Southeast Area Specific Plan (SEASP) and Beach Oil Minerals Project (BOMP), the interpretive center has been proposed to be located at an alternate location.

The Subarea 24 North area is not sized or suitable for a playground. The LCWA has the resources available to maintain, preserve, and restore this area consistent with the intent to provide a public open space resource.

Response 1.4

The commenter states that due to potential risk for flooding risk for current and future conditions, the IS-MND should include the anticipated life of the proposed structure and the project's vulnerability to hazards. The IS-MND should identify alternatives, design elements, and adaptation strategies.

The commenter is referred to the IS-MND, specifically at page 89, which discusses the proposed projects ability to be impacted by a flood event due to its location in a floodplain or zone. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the project site is not located in a 100-year flood zone (Map # 06037C1988F). The project site is situated in Zone X, which refers to an area with reduced flood risk due to levee (FEMA 2019. Therefore, no impact would occur to the potentially for flooding on-site.

The City of Long Beach has not formally adopted flood hazards maps beyond FEMA FIRM maps. The project would be required to construct the project in accordance with the floodplain requirements established at the time of building plan check submittal. As such, the conditions of approval include an advisory condition related to design alternatives to adapt to potential future flooding.

Moreover, the comment regarding potential conflicts regarding flood hazards and project vulnerability into the future 2080 scenario is unclear. A lead agency is not required to perform "reverse CEQA analysis" (analyzing the impacts of the existing environment on the project and its future users) unless the project has a reasonably foreseeable risk of exacerbating existing environmental hazards. The proposed project includes open space areas on the west side of Studebaker Road, and two 35-foot high buildings for industrial operation including 21,000 sf office space.

Development of the proposed project is not introducing permanent sensitive receptors or at-risk receptors to the project site, nor is the proposed project increasing the severity of a flood hazards in the project area over time. Thus, the impact of the proposed project on hazardous conditions in the area is considered less than significant.

Response 1.5

The commenter states if City's LCP amendment request, which includes the City's proposal to replace the SEADIP with the Southeast Area Specific Plan (SEASP), is certified prior to the local Coastal Development Permit, the project must be found to be consistent with the SEASP and the rest of the LCP prior to approval. CCC requests notification of any future activity associated with this project or related projects.

This comment is noted. The City of Long Beach will notify the CCC with future actions related to this project.

DEPARTMENT OF TRANSPORTATION
DISTRICT 7- OFFICE OF REGIONAL PLANNING
100 S. MAIN STREET, SUITE 100
LOS ANGELES, CA 90012
PHONE (213) 897-6536
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TTY 711
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Letter 2

Making Conservation a California Way of Life.

October 7, 2019

Maryanne Cronin
Planner
City of Long Beach
411 W. Ocean Blvd., 3rd Floor
Long Beach, CA 90802

RE: 300 Studebaker Road Industrial Park Project
Mitigated Negative Declaration (MND)
SCH# 2019099005
GTS# 07-LA-2019-02806
Vic. LA – 1/ PM 0.209

Dear Ms. Cronin:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project involves the demolition of 400 square feet (sf) of existing concrete, on-site pipeline structures, and asphalt paving, and the development of two concrete tilt-up industrial buildings, situated on 6.69 acres of land east of Studebaker Road. Approximately 1.81 acres of vacant land west of Studebaker Road, at the northwest and southwest corners of Studebaker Road and Loynes Drive, would be dedicated as open space to the Los Cerritos Wetlands Authority as part of this project. The project would include planting of an assortment of native grasses and tree species consistent with the Los Cerritos Wetlands Authority, including low growing grasses along street frontage. Situated within the eastern project area, the two 35-foot high buildings would total 139,200 sf, including 21,000 sf office space. The individual building sizes would be 91,700 sf and 47,500 sf, respectively. The project would support potential uses such light manufacturing, warehousing, assembly and distribution. The proposed facility would operate 24 hours a day. The building layout may be broken into six or more individual spaces depending upon final tenant demand. Office spaces would be provided in the interior frontage of each building to support the business operations. Office space would occupy a maximum of 25 percent of the gross floor area pursuant to Chapter 21.33 of the Long Beach Municipal Code. Office space in Building 1 would total 14,000 sf and 7.,000 sf in Building 2, which together represents 21,000 sf or 15 percent of the gross floor area.

The nearest State facilities to the proposed project are Pacific Coast Highway/ State Route 1 (SR-1) and State Route 22 (SR-22). After reviewing the Mitigated Negative Declaration (MND), Caltrans has the following comments:

The mission of Caltrans is to provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability. Senate Bill 743 (2013) mandates that Vehicle Miles Traveled (VMT) be used as the primary metric in identifying transportation impacts of all future development projects under CEQA, starting July 1, 2020. For information on determining transportation impacts in terms of VMT on the State Highway System, see the Technical Advisory on Evaluating Transportation Impacts in CEQA by the California Governor's 2.1

Office of Planning and Research, dated December 2018: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

Caltrans acknowledges the implementation of Transportation Demand Management (TDM) such as the provision of preferential parking for vanpools, bicycle racks or other secure bicycle parking, and sidewalks or other designated pedestrian pathway connecting each building to the external pedestrian circulation system. Caltrans encourages the Lead Agency to continue the reduction of vehicle speeds in order to benefit pedestrian and bicyclist safety, as there is a direct link between impact speeds and the likelihood of fatality. The most effective methods to reduce pedestrian and bicyclist exposure to vehicles is through physical design and geometrics. Such methods include the construction of physically separated facilities such as Class IV bike lanes, sidewalks, pedestrian refuge islands, landscaping, street furniture, and reductions in crossing distances through roadway narrowing. Visual indicators such as, but not limited to, pedestrian and bicyclist warning signage, flashing beacons, crosswalks, and striping should be used to indicate to motorists that they can expect to see and yield to pedestrians and people on bikes. 2.2

Due to the scope of the project and proximity to the State facilities, the following on- and off-ramp and intersections should be included in the study in order to understand the assignment of project trips to State facilities:

- State Route 22 (on- and off- ramps)
- State Route 1 (Pacific Coast Highway) and 2nd Street
- PCH and Loynes Drive

2.3

Caltrans recommends that the Highway Capacity Manual (HCM) Sixth Edition method be used for conducting all operational and conflict analyses on State highway facilities. Specifically, queuing analyses based on the HCM queuing methodology are required for any Caltrans' off-ramps that would be potentially significantly impacted by the project. Also, when the State highway facility has saturated flows, it is encouraged that a micro-simulation model be used for the analyses.

The Tenth Edition of the Institute of Transportation Engineers' (ITE) Trip Generation Manual should be used for determining trip generation forecasts and trip reductions (e.g. pass-by, diverted, and internal capture trips). Local trip generation rates are acceptable if appropriate validation is provided.

As a reminder, any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles of State highways will need a Caltrans transportation permit. We recommend large size truck trips be limited to off-peak commute periods. 2.4

If you have any questions, please contact project coordinator Mr. Carlo Ramirez, at carlo.ramirez@dot.ca.gov and refer to GTS# 07-LA-2019-02806.

Sincerely,

MIYA EDMONSON
IGR/CEQA Branch Chief

Cc: Scott Morgan, State Clearinghouse

Letter 2

COMMENTER: Miya Edmonson, IGR/CEQA Branch Chief, California Department of Transportation (Caltrans)

DATE: October 7, 2019

Response 2.1

The commenter states that the Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts in CEQA contains guidance on using vehicles miles traveled (VMT) as a metric for evaluating impacts to the State Highway System.

The City of Long Beach has not adopted metrics for the measurement of VMT in traffic impact analyses. A qualitative analysis was included in the traffic section of the IS-MND. The proposed project would be expected to reduce per capita VMT by developing an industrial/manufacturing use in an existing urban area near public transit options. The location in an urban area would generally limit the travel distance needed for work-related trips and the adjacency of transit to the project site supports a reduction in VMT per employee as compared to a location not near transit. Furthermore, because the project involves construction of over 25,000 sf of nonresidential development, it would be required to implement transportation demand management (TDM) strategies pursuant to Section 21.64 of the LBMC.

Response 2.2

The commenter states that Caltrans encourages reduction of vehicle speeds to improve bicycle and pedestrian safety and lists examples of types of physically separated facilities and visual indicators to further enhance safety measures.

The commenter is referred to page 29 of the Traffic Impact Analysis (TIA) included as Appendix J to the IS-MND, which provides that a sight distance analysis was conducted along Studebaker Road and Loynes Drive at the proposed location of the main project driveway to ensure driver visibility and safety. The TIA determined that there are no sight distance obstructions at the proposed project driveways and the project driveways would meet the minimum sight distance requirements specified in the Caltrans Highway Design Manual.

Response 2.3

The commenter states that the following on- and off-ramp and intersections should be included in the study to understand the assignment of project trips to State facilities:

- State Route-22 (SR-22) (on- and off-ramps)
- State Route 1 (Pacific Coast Highway) and 2nd Street
- Pacific Coast Highway and Loynes Drive

Caltrans recommends the use of methodology included in the Highway Capacity Manual (HCM) 6th Edition in the analysis on State and highway facilities, specifically queuing analysis for Caltrans off-ramps that may be impacted by the project.

The traffic study prepared for the project evaluates traffic generated by the project, using Institute of Transportation Engineers, (ITE) rates 10th Annual 2017 rates. Based on the trip generation and

distribution, there would be fewer than 50 peak hour trips added to any State facility (Pacific Coast Highway, or SR-22).

According to the Caltrans *Guide for the Preparation of Traffic Impact* Studies, the following criterion is a starting point in determining when a traffic impact study is needed to evaluate potential impacts on the State Highway System. When a project:

1. Generates over 100 peak hour trips assigned to a State highway facility

   Per Figure 7 of the TIA, the project would generate a maximum of 34 p.m. peak hour trips towards any State Highway Facility (Pacific Coast Highway or SR-22). This is below the 100 peak hour trip threshold.

2. Generates 50 to 100 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing noticeable delay; approaching unstable traffic flow conditions (LOS "C" or "D").

   Per Figure 7 of the TIA, the project would generate a maximum of 34 p.m. peak hour trips towards any State Highway Facility (Pacific Coast Highway or State Route 22). This is below the 50-100 peak hour trip threshold.

3. Generates 1 to 49 peak hour trips assigned to a State highway facility – the following are examples that may require a full TIS or some lesser analysis
   a. Affected State highway facilities experiencing significant delay; unstable or forced traffic flow conditions (LOS "E" or "F").
   b. The potential risk for a traffic incident is significantly increased (i.e., congestion related collisions, non-standard sight distance considerations, increase in traffic conflict points, etc.).
   c. Change in local circulation networks that impact a State highway facility (i.e., direct access to State highway facility, a non-standard highway geometric design, etc.).

The project does not directly access a State Highway Facility and the number of trips added to the roadway network is not anticipated to cause significant delay or increase accidents on the State Highway System.

Project Trip Generation, Distribution and Assignment

The TIA evaluated the traffic generated by the project based on trip rates from the ITE and converted to Passenger Car Equivalents (PCEs). As shown in Table D of the traffic study, the project would generate 57 a.m., 60 p.m. and 538 average daily traffic (ADT). However, not all of these trips would access the State Highway System.

Figure 7 of the TIA illustrates the project trip assignment. Based on the trip distribution of the project trips (including both passenger vehicles and trucks), only a portion of project traffic would use Pacific Coast Highway or SR-22. During the p.m. peak hour, 34 trips (PCEs) would be expected to travel north of the project site on Studebaker Road towards SR-22. Along Loynes Drive, headed westbound, there is expected to be seven project trips during the p.m. peak hour, as trucks are not allowed to travel on Loynes Drive.

Based on the project trip generation and the directionality of project passenger cars and trucks, there would be less than 50 peak hour trips assigned to any State facility (Pacific Coast Highway or SR-22). As such, this would not meet the Caltrans thresholds for analysis. There is no need to expand

the study area, per Caltrans comment, as there would be no impact to State highway facilities based on implementation of the project.

Because the TIA prepared for the project shows the project does not meet the HCM criteria for specifically queuing analysis, there is no need to expand the study area and no impact to State Facilities.

Response 2.4

The commenter states that transportation of heavy construction equipment that requires oversized-transport vehicles on State highways will require a Caltrans construction permit and recommends that large size truck trips be limited to off-peak commute periods.

Thank you for your comment. The comment does not address the adequacy of the IS-MND and no revisions to the IS-MND are necessary in response to this comment. A condition of approval has been incorporated into the record of proceedings. Your letter will be forwarded to the members of the decision-making body and public for review and consideration.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

Letter 3

October 8, 2019

Maryanne Cronin
Long Beach, City of
411 W. Ocean Blvd., 3rd Fl
Long Beach, CA 90802

Subject: 300 Studebaker Road Industrial Park Project
SCH#: 2019099005

Dear Maryanne Cronin:

The State Clearinghouse submitted the above named MND to selected state agencies for review. The review period closed on 10/7/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, please visit: https://ceqanet.opr.ca.gov/2019099005/2 for full details about your project. 3.1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL 1-916-445-0613 state.clearinghouse@opr.ca.gov www.opr.ca.gov

Letter 3

COMMENTER: Scott Morgan, State Clearinghouse, Office of Planning and Research

DATE: October 8, 2019

Response 3.1

The commenter states that the State Clearinghouse submitted the IS-MND to selected state agencies for review and no state agencies submitted comment by that date. The IS-MND has complied with State Clearinghouse review requirements pursuant to CEQA.

Thank you for your comment. No revisions to the IS-MND are necessary in response to this comment.

Los Cerritos Wetlands Authority

Letter 4

Governing Board

Samuel Schuchat, Chair
Coastal Conservancy

Suzie Price, Vice-Chair
City of Long Beach

Joe Kalmick, Board Member
City of Seal Beach

Roberto Uranga, Board Member
Rivers and Mountains Conservancy

Mark Stanley
Executive Officer

October 7, 2019

Maryanne Cronin, Planner
City of Long Beach
411 West Ocean Blvd, 3rd Floor
Long Beach, California 90802

Re: Response to MND - 300 Studebaker Road Industrial Park Project

Dear Ms. Cronin:

The Los Cerritos Wetlands Authority (LCWA) is a joint powers authority between the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy, the State Coastal Conservancy, and the Cities of Long Beach and Seal Beach, whose objective is to preserve and restore the Los Cerritos Wetlands.

Staff to the LCWA reviewed the proposed Mitigated Negative Declaration (MND) for the 300 Studebaker Road Industrial Park Project. Upon completion of the review, there are five items we believe merit some attention and consideration.

1. In Figure 9, page 17, the western parcels are labeled wetlands mitigation area. From the LCWA's interpretation of the project and the definition of mitigation, we recommend that the western parcels be labeled native plant habitat restoration area instead. 4.1

2. Staff to the LCWA recommends developing public access plans in the native plant habitat restoration area during finalization of project construction drawings. The LCWA would be willing to provide advice/consultation on the restoration and public access plans for the western parcels generated by the project proponent, or the type of analysis that should be considered to develop the restoration plans, to determine the most appropriate plant habitat-type and passive recreation best suited for the long-term sustainability of the site and larger Los Cerritos Wetlands area. 4.2

3. It is mentioned in several instances, such as under Aesthetics pg 26 question b., that the landscape restoration in the western parcels will be "consistent with LCWA." We recommend that the statement instead read that the western project area would be developed under the LCWA's consultation and advice. 4.3

Los Cerritos Wetlands Authority · El Encanto · 100 N. Old San Gabriel Canyon Road · Azusa, CA 91702
◆ Office-626.815.1019 ◆ Fax-626.815.1269 ◆

4. Under the Hazards and Hazardous Material section pg 80, OEF 12 states that fill from unknown sources is present on the western project area parcels and may warrant further investigation. LCWA staff may work with the project proponent to determine if OEF 12 needs to be further investigated during the development of final work plans. 4.4

5. Lastly, it is mentioned in several instances, for example in the last paragraph on pg 38, that the western project area will be restored and "donated to the LCWA". The LCWA would like to continue discussions regarding the *potential* for a land donation and recommend that wording in the MND reflect the potential for the open space to be donated to a public agency because formal agreements have not yet been developed. 4.5

Should you have any questions please contact Project Manager, Sally Gee, at sgee@rmc.ca.gov or at 626-815-1019 ext. 104.

Sincerely,

Mark Stanley
Executive Officer

CC: Mark Payne, Panattoni Development Company, Inc.
Ryan Jones, Panattoni Development Company, Inc.

Letter 4

COMMENTER: Mark Stanley, Executive Officer, Los Cerritos Wetlands Authority

DATE: October 7, 2019

Response 4.1

The commenter recommends that the western parcels in Figure 9, page 17 currently "labeled wetlands mitigation area" be changed to "native plant restoration area."

This comment does not address the adequacy of the IS-MND. Per the commenter's request, Figure 9 has been revised in response to this comment (see also Errata of the Final IS-MND).

Response 4.2

The commenter states that Los Cerritos Wetland Authority (LCWA) recommends developing public access plans in the native habitat restoration area during finalization of project drawings, and states that LCWA is able to provide advice/consultation.

A condition of approval has been incorporated into the record that requires the development of a public access and restoration plan during the finalization of project plans.

Response 4.3

The commenter recommends a universal change of the language "the landscape restoration in the western parcels will be consistent with LCWA" to "the landscape restoration in the western parcels would be developed under the LCWA's consultation and advice."

This comment does not address the adequacy of the IS-MND. Based on this comment, the following text revisions have been made on Page 16, *Project Description*, of the Final IS-MND as follows:

> The project would include planting of an assortment of native grasses and tree species ~~consistent with the LCWA~~ <u>under the LCWA's consultation and advice</u>, including low growing grasses along street frontage.

Based on this comment, the following text revisions have been made on in Section 1, Page 25, *Aesthetics*, of the Final IS-MND as follows:

> The project would include planting of an assortment of native grasses and tree species ~~consistent with the LCWA~~ <u>under the LCWA's consultation and advice</u>, including low growing grasses along street frontage.

Based on this comment, the following text revisions have been made on in Section 1, Page 25, *Aesthetics*, of the Final IS-MND as follows:

> Furthermore, the western project area would undergo landscape restoration ~~consistent with the LCWA~~ <u>under the LCWA's consultation and advice</u>.

Based on this comment, the following text revisions have been made on in Section 11, Page 91, Land Use and Planning, of the Final IS-MND as follows:

> The proposed project would include the removal of 400 sf of existing concrete (berm), on-site pipeline structures; and asphalt paving, development of a warehouse/manufacturing facility with associated office support, as well as wetland restoration ~~consistent with the LCWA~~ under the LCWA's consultation and advice, and offsite sewer line extension.

Response 4.4

The commenter states that LCWA staff may work with the project proponent to determine if OEF 12 (fill from unknown sources, as listed in the *Hazards and Hazardous Materials* section) needs to be further investigated.

A condition of approval has been incorporated into the record that requires the coordination between the project proponent and LCWA related to further hazardous waste investigations prior to the transfer of property to LCWA.

Response 4.5

The commenter states that LCWA would like to continue discussions regarding the potential for a land donation and recommends that the wording in the IS-MND reflect the potential for open space to be donated to a public agency.

Based on this comment, the following text revisions have been made in the Final IS-MND as follows to state that the land will be donated to the LCWA, or a designated state or City of Long Beach agency:

> Section 1, *Aesthetics*, Page 27:
>
> Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.
>
> Section 2, *Air Quality*, Page 38:
>
> Under the proposed project, the eastern project area would be developed with industrial warehouses and the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.
>
> Section 3, *Biological Resources*, Page 51:
>
> Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to ~~the Los Cerritos Wetland Authority~~ LCWA or a designated state or City of Long Beach agency.
>
> Section 11, *Land Use and Planning*, Page 92:
>
> Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.

Source: GAA Architects

OCTA

Letter 5

AFFILIATED AGENCIES

Orange County Transit District

Local Transportation Authority

Service Authority for Freeway Emergencies

Consolidated Transportation Service Agency

Congestion Management Agency

October 7, 2019

Ms. Maryanne Cronin
Planner
City of Long Beach – Development Services
411 W. Ocean Blvd., 3rd Floor
Long Beach, CA 90802

Subject: **300 Studebaker Road Industrial Park Project Initial Study/Mitigated Negative Declaration**

Dear Ms. Cronin:

Thank you for providing the Orange County Transportation Authority (OCTA) with the Initial Study/Mitigated Negative Declaration for the 300 Studebaker Road Industrial Park Project (Project). The following comment is provided for your consideration:

- Appendix J ('Traffic Impact Analysis'), Section 'Existing Conditions' (Page 11) describes the existing conditions for 2nd Street as "a six-lane east-west arterial south of the project site. It is classified as a Major Arterial (Scenic Route) within the city limits. This arterial's name changes to Westminster Avenue at the Orange County line." Please note that 2nd Street becomes a four-lane arterial east of Studebaker Road. 5.1

Throughout the development of this project, we encourage communication with OCTA on any matters discussed herein. If you have any questions or comments, please contact me at (714) 560-5907 or at dphu@octa.net.

Sincerely,

Dan Phu
Manager, Environmental Programs

Orange County Transportation Authority
550 South Main Street / P.O. Box 14184 / Orange / California 92863-1584 / (714) 560-OCTA (6282)

Letter 5

COMMENTER: Dan Phu, Manager, Environmental Programs, Orange County Transportation Authority

DATE: October 7, 2019

Response 5.1

The commenter notes that the description of 2nd Street, as found on page 11 of Appendix J, should be changed to reflect that 2nd Street becomes a four-lane arterial east of Studebaker Road.

Thank you for your comment. The comment does not address the adequacy of the IS-MND. Nevertheless, based on this comment, the following text revisions have been made in the TIA as follows (the revised page of the TIA is attached to Errata of this Final IS-MND):

> Appendix J, *Traffic Impact Analysis for the Long Beach Business Park Project*, Page 11:
>
> 2nd Street: 2nd Street is a six-lane east-west arterial south of the project site. It is classified as a Major Arterial (Scenic Route) within the city limits. This arterial's name changes to Westminster Avenue at the Orange County line. *2nd Street becomes a four-lane arterial east of Studebaker Road.*

We will forward your letter to the members of the decision-making body for their review and for the public and decision-makers to consider.

- **Studebaker Road:** Studebaker Road is a four-lane, north-south roadway abutting the project and parallel to the Los Cerritos Channel. The route is classified as a Major Arterial by the City of Long Beach Mobility Element. The roadway also provides direct access to Interstate 405 and SR-22. Studebaker Road begins at 2nd Street in Long Beach and extends to Los Coyotes Diagonal south of Lakewood.
- **Loynes Drive:** Loynes Drive is an east-west roadway adjacent to and west of the project that spans from Studebaker Road to Bellflower Boulevard in Long Beach. Within the study area, Loynes Drive will provide access to the project site at the signalized T-intersection of Studebaker Road and Loynes Drive.
- **2nd Street:** 2nd Street is a six-lane east-west arterial south of the project site. It is classified as a Major Arterial (Scenic Route) within the city limits. This arterial's name changes to Westminster Avenue at the Orange County line. 2nd Street becomes a four-lane arterial east of Studebaker Road.
- **Bellflower Boulevard.** Bellflower Boulevard is a six-lane north-south arterial northwest of the project site. The City's Transportation Element classifies this roadway as a Major Arterial.
- **7th Street**: 7th Street is a six-lane east-west arterial northwest of the project site. This arterial transitions into SR-22 east of PCH and is classified as a Major Arterial.

Existing Traffic Volumes

National Data and Surveying Services collected the weekday peak-hour intersection turn volumes for the study intersection of Studebaker Road and Loynes Drive in September 2018. Vehicle classification counts were conducted for the study area intersection on Loynes Drive and Studebaker Road, which included passenger cars, two-axle trucks, three-axle trucks, four-axle trucks, bicycles, and pedestrians. Figure 4 presents the existing a.m. and p.m. peak-hour volumes in passenger car equivalent (PCE) for the study area intersections. Appendix A provides the existing count data.

Existing Intersection Level of Service Analysis

Table A summarizes the results of the existing a.m. and p.m. peak-hour LOS analysis for the signalized study area intersection using the ICU and HCM methodologies. Appendix B provides the existing LOS calculation worksheets. As the table indicates, the study area intersection operates at an acceptable LOS during the a.m. and p.m. peak hours under both methodologies.

Table A: Existing Intersection LOS Summary

Intersection	Analysis Method	AM Peak Hour		PM Peak Hour	
		V/C or Delay	LOS	V/C or Delay	LOS
Studebaker Road/Loynes Drive	ICU	0.68	B	0.72	C
	HCM	10.8	B	13.2	B

Delay is reported in seconds (for HCM)
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
LOS = level of service
V/C = volume-to-capacity ratio (for ICU)

SANITATION DISTRICTS OF LOS ANGELES COUNTY

Converting Waste Into Resources

Letter 6

Robert C. Ferrante
Chief Engineer and General Manager
1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

October 7, 2019

Ref. DOC 5297891

Ms. Maryanne Cronin, Planner
City of Long Beach
Department of Development Services
333 West Ocean Boulevard, 3rd Floor
Long Beach, CA 90802

Dear Ms. Cronin:

NOI Response for the 300 Studebaker Road Industrial Park Project

The Sanitation Districts of Los Angeles County (Districts) received a Notice of Intent to Adopt a Mitigated Negative Declaration (NOI) for the subject project on September 6, 2019. We offer the following comments regarding sewerage service:

1. The majority of the project area is outside the jurisdictional boundaries of the Districts and will require annexation into District No. 3 before sewerage service can be provided to the proposed development. For a copy of the Districts' Annexation Information and Processing Fee sheets, go to www.lacsd.org, Wastewater & Sewer Systems, and click on Annexation Program. For more specific information regarding the annexation procedure and fees, please contact Ms. Donna Curry at (562) 908-4288, extension 2708. 6.1

2. Because of the project's location, the flow originating from the proposed project would have to be transported to the Districts' trunk sewer by local sewer(s) that are not maintained by the Districts. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or Districts' trunk sewer. The nearest Districts' trunk sewer is the Marina Trunk Sewer Section 4, located in public right-of-way on the west side of Pacific Coast Highway north of 2nd Street. The Districts' 15–inch diameter trunk sewer has a capacity of 1.4 million gallons per day (mgd) and conveyed a peak flow of 0.8 mgd when last measured in 2017. 6.2

3. The wastewater generated by the proposed project will be treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 mgd and currently processes an average flow of 261.1 mgd. 6.3

4. The expected average wastewater flow from the project, described in the notice as 139,300 square feet of industrial buildings of which 21,000 square feet is office space, is 7,155 gallons per day. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, click on Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link. 6.4

5. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System for increasing the strength or quantity of wastewater discharged from connected facilities. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before this project is permitted to discharge to the Districts' Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Wastewater & Sewer Systems, and click on Connection Fee, Service Charge and More. In determining the impact to the Sewerage System and applicable connection fees, the Districts will determine the user category (e.g. Condominium, Single Family home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, the developer should contact the Districts' Wastewater Fee Public Counter at (562) 908-4288, extension 2727. 6.5

6. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CCA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise the developer that the Districts intend to provide this service up to the levels that are legally permitted and to inform the developer of the currently existing capacity and any proposed expansion of the Districts' facilities. 6.6

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR:dc

cc: D. Curry
A. Schmidt
A. Howard

DOC 5326016.D0399

Letter 6

COMMENTER: Adriana Raza, Customer Service Specialist, Facilities Planning Department, Sanitation Districts of Los Angeles

DATE: October 7, 2019

Response 6.1

The commenter states that the project area is outside the jurisdictional boundaries of the Districts and will require annexation into District No. 3 prior to service. The Districts has provided comments on the Draft IS-MND, which are addressed below in the following responses.

Response 6.2

The commenter notes that the flow originating from the project would need to be transported to the Districts' trunk sewer by local sewer(s) that are not maintained by the Districts. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or Districts' trunk sewer. The nearest Districts' trunk sewer is the Marina Trunk Sewer Section 4, located in public right-of-way on the west side of Pacific Coast Highway north of 2nd Street. The Districts' 15-inch diameter trunk sewer has a capacity of 1.4 million gallons per day (mgd) and conveyed a peak flow of 0.8 mgd when last measured in 2017.

Based on this comment, the following text revisions have been made in Section 19, *Utilities and Service Systems*, of the Final IS-MND on page 138 as follows:

> The project site is located outside the service area and jurisdictional boundaries of the Districts and will require annexation into District No. 3 prior to service. The proposed sewer line extension would convey wastewater to the nearest Districts' trunk sewer, the Marina Trunk Sewer Section 4, located in public right-of-way on the west side of Pacific Coast Highway north of 2nd Street. The Districts' 15-inch diameter trunk sewer has a capacity of 1.4 million gallons per day (mgd) and conveyed a peak flow of 0.8 mgd when last measured in 2017 (Districts 2019).

This correction does not alter the IS-MND analysis or conclusions.

Response 6.3

The commenter note that the wastewater generated by the proposed project will be treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 mgd and currently processes an average flow of 261.1 mgd.

As discussed in Section 19, *Utilities and Service Systems, Wastewater* (see page 138 of the IS-MND), a majority of the City's wastewater is delivered to the Joint Water Pollution Control Plant (JWPCP) of the Los Angeles County Sanitation Districts (LACSD). The remaining portion is delivered to the Long Beach Water Reclamation Plant (LBWRP) of the LACSD. The JWPCP provides advanced primary and partial secondary treatment for 260 million gallons of wastewater per day (MGD), with a permitted capacity for 400 MGD of wastewater (LACSD 2018a), resulting in an available capacity of 140 MGD.

Based on this comment, the following text revisions have been made in Section 19, *Utilities*, of the Final IS-MND on page 138 as follows:

> The JWPCP provides advanced primary and partial secondary treatment for ~~260~~ 261.1 million gallons of wastewater per day (MGD), with a permitted capacity for 400 MGD of wastewater ~~(LACSD 2018a)~~, resulting in an available capacity of ~~140~~ 138.9 MGD (Districts 2019).

This correction does not alter the IS-MND analysis or conclusions.

Response 6.4

The commenter notes that the expected increase in average wastewater flow from the proposed project would generate 7,155 gallons per day based on the Districts' average wastewater generation factors. As discussed in Section 19, *Utilities and Service Systems, Wastewater* (see page 138 of the IS-MND), assuming that 100 percent of the proposed project's water use would be treated as wastewater, 35.6 million gallons per year (approximately 97,534 gallons per day or 0.1 MGD) represents approximately 0.07 percent of the remaining daily capacity of 140 MGD of wastewater at the JWPCP. The proposed project would not require the construction of new treatment facilities as the JWPCP would have adequate capacity to treat the wastewater produced by the proposed project. Impacts would be less than significant.

Based on this comment, and Response 6.3, the following text revisions have been made in Section 19, *Utilities and Service Systems*, of the Final IS-MND on page 138 as follows:

> ~~Assuming that 100 percent of the proposed project's water use would be treated as wastewater, 35.6 million gallons per year (approximately~~ Based on the Districts' generation rates the proposed project would generate ~~97,534~~ 7,155 gallons of wastewater per day or ~~0.1~~ 0.007 MGD~~)~~, which represents approximately ~~0.07~~ 0.005 percent of the remaining daily capacity of ~~140~~ 138.9 MGD of wastewater at the JWPCP (Districts 2019).

In addition, based on this comment, the following text revisions have been made in Section 19, *Utilities and Service Systems*, of the Final IS-MND on page 140 as follows:

> ~~As discussed under impact discussion 19(*a*). of this section, the proposed project would create demand for an estimated 35.6 million gallons of wastewater per year according to CalEEMod estimations (Appendix A, Air Quality/Greenhouse Gas Modeling Results). Assuming that 100 percent of this water use would be treated as wastewater, 36.5 million gallons per year (approximately~~ Based on Districts' wastewater generation rates the proposed project would generate ~~97,534~~ 7,155 gallons per day or ~~0.1~~ 0.007 MGD) represents approximately ~~0.07~~ 0.005 percent of the remaining daily capacity of ~~140~~ 138.9 MGD of wastewater at the JWPCP (Districts 2019).

Response 6.5

The commenter discusses the Districts' ability to charge connection fees to the Districts' Sewerage System for increasing the strength or quantity of wastewater discharged from connected facilities. The Districts notes that payment of a connection fee will be required before a permit to connect to the sewer is issued to the proposed project.

Based on this comment, the following text revisions have been made in Section 19, *Utilities and Service Systems*, of the Final IS-MND on page 138 as follows:

> Under the California Health and Safety Code, the Districts charge connection fees to the District's Sewerage System for increasing the strength or quantity of wastewater discharged

from connected facilities. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System and to accommodate proposed development. As such, the project applicant would be required to pay a sewer connection fee prior to the issuance of a sewer connection permit which would offset any project impacts to the sewer system.

This correction does not alter the IS-MND analysis or conclusions.

Response 6.6

The commenter notes that in order for the Districts to conform to the Federal Clean Air Act, the capacities of the Districts' wastewater treatment facilities must be based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). All expansions of Districts' treatment facilities will therefore be limited to levels associated with approved growth identified by SCAG. The commenter notes that their comment letter does not guarantee wastewater service but to advise the applicant that Districts intend to provide service up to the levels that are legally permitted and inform the applicant of existing capacity.

As discussed above under Response 6.2, the proposed project would be required to adhere to all requirements pertaining to wastewater conveyance and sewer line connection as required by the LBMC, Chapter 15.01, which regulates sewer installation, requirements, permits and charges. As discussed above under Response 6.5, the project applicant would be required to pay a sewer connection fee prior to issuance of a sewer connection permit, which would offset any project impacts to the sewer system. Additionally, as discussed above, under Response 6.3 and 6.4, wastewater generated by the proposed project would be within the remaining capacity of the JWPCP. Lastly, as discussed in Section 14, *Population and Housing*, the proposed project would not cause a substantial increase in population that is inconsistent with SCAG's population and employment projections. For these reasons, and consistent with impact the conclusion as presented in in the IS-MND, impacts to sewer and wastewater conveyance would be less than significant.

Los Cerritos Wetlands Land Trust
for Long Beach and Seal Beach

PO Box 30165
Long Beach, CA 90853

www.lcwlandtrust.org

Letter 7

October 8, 2019

Maryanne Cronin, Planner
City of Long Beach
411 West Ocean Blvd, 3rd Floor
Long Beach, California 90802

Re: 300 Studebaker Road Industrial Park Project

Dear Ms. Cronin:

The Los Cerritos Land Wetlands Land Trust (the "Land Trust") is a non-profit, public benefit corporation located in Los Angeles and Orange Counties, California, with goals of preserving, enhancing, and educating the public about Los Cerritos Wetlands. The Land Trust would like to offer our support for the 300 Studebaker Road Business Park Development currently undertaken by Panattoni Development. We have been in communication with Panattoni representatives, Mark Payne and Ryan Jones, about the project and have engaged them in discussions about the current development plan. 7.1

During the process of engagement, Mark Payne provided presentations to the community to address any questions regarding the current project. The Land Trust board of directors is impressed by their willingness to work with the Land Trust on the restoration and donation of open space parcels to public hands, and to incorporate bird safe treatments to the project.

If you have any questions for the Land Trust, please contact me.

Sincerely,

John Fries
President
Los Cerritos Wetlands Land Trust

Letter 7

COMMENTER: John Fries, President, Los Cerritos Wetlands Land Trust

DATE: October 8, 2019

Response 7.1

The commenter states support of the Los Cerritos Wetlands Land Trust for the project, specifically the restoration and donation of open space parcels as public lands and incorporation of safe bird treatments under the project.

Thank you for your comment. The comment does not address the adequacy of the IS-MND and no revisions to the IS-MND are necessary in response to this comment. We will forward your letter to the members of the decision-making body for their review and for the public and decision-makers to consider.

2 Errata to the Initial Study/Mitigated Negative Declaration

The following modifications are Lead Agency driven or are provided in Response to Comments received on the Initial Study/Mitigated Negative Declaration (IS/MND). The modifications are not substantial changes are proposed in the project which require major revisions and do not change the conclusions of the draft IS/MND. Changes are shown with ~~strike-out~~ for text that is removed and double underline for new text.

Project Description

Page 1 (footnote)

[1] For the purposes of the IS/MND the parcels described are assessor parcels for taxation purposes; however, as shown in the ALTA/NPSS Title the project site contains ~~2~~ three (3) legal parcels.

Page 15 (Table 1 Project Summary)

Project Area	Square Feet	Acres			
Site Area (gross)	370,106	8.50			
Street Dedication	0	0.00			
Total Project Area	**370,106**	**8.50**			
Parcel Area	**Parcel 1[1]**	**Parcel 2[1]**	**Parcel 3[1]**	**Parcel 4[1]**	**Total**
Net Area (sf)	177,795	113,450	57,426	21,433	370,104
Net Acreage	4.08	2.60	1.32	0.49	8.50
Buildable	**177,795**	**113,450**	**0.00**	**0.00**	**291,245**
Buildable Acreage	4.08	2.60	0.00	0.00	6.69
Open Space Provided	17,810	14,510	57,426	21,433	111,179
	Building 1	**Building 2**	**Total**		
Building Area (sf)					
Warehouse	77,700	40,500			118,200
Office - Ground Floor	4,000	2,000			6,000
Total Building Footprint	**81,700**	**42,500**			**124,200**
Mezzanine Office	10,000	5,000			15,000
Total Building Area	91,700	47,500			139,200
Total Office Area	14,000	7,000			21,000
Parking					
Standard (9 ft x 18 ft)	79	38			117
Accessible Parking (9 ft x 18 ft)	5	4			9
EV Space	28	14			42
Total	**112**	**56**			**168**
Site Area and Coverage					
In square feet	177,995	113,450			370,104
In acres	4.08	2.60			8.50
Coverage	46.1%	37.5%			42.7%
FAR	51.7%	42.0%			47.9%
Truck Doors					
Dock Doors	12	8			20
Grade Doors	4	2			6
EV Charging Station	2	1			

Notes: sf = square feet; ft = feet

Source: GAA Architects 2019

[1]For the purposes of this table, the project area is divided into four parcels. Parcels 1 and 2 reflect the adjusted lot line on the east side of Studebaker Road at the location of the two proposed industrial buildings. Parcels 3 and 4 refer to the two vacant parcels on the west side of Studebaker Road proposed for open space dedication.

Page 16

The project would include planting of an assortment of native grasses and tree species ~~consistent with the LCWA~~ under the LCWA's consultation and advice, including low growing grasses along street frontage.

Page 17

As shown in the following page, Figure 9 has been revised to reflect the change of parcels formerly labeled "wetlands mitigation area" to "native plant restoration area."

Aesthetics

Page 25

The project would include planting of an assortment of native grasses and tree species ~~consistent with the LCWA~~ under the LCWA's consultation and advice, including low growing grasses along street frontage.

Page 26

Furthermore, the western project area would undergo landscape restoration ~~consistent with the LCWA~~ under the LCWA's consultation and advice.

Page 27

Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.

Air Quality

Page 38

Under the proposed project, the eastern project area would be developed with industrial warehouses and the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.

Biological Resources

Page 51

Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to ~~the Los Cerritos Wetland Authority~~ LCWA or a designated state or City of Long Beach agency.

Land Use and Planning

Page 91

The proposed project would include the removal of 400 sf of existing concrete (berm), on-site pipeline structures; and asphalt paving, development of a warehouse/manufacturing facility with

Source: GAA Architects

associated office support, as well as wetland restoration ~~consistent with the LCWA~~ under the LCWA's consultation and advice, and offsite sewer line extension.

Page 92

Under the proposed project, the ~~western~~ open space in the project area would be restored to native wetland habitat and donated to the LCWA or a designated state or City of Long Beach agency.

Noise

Page 110

As discussed under impact *a*. of this section, wetland restoration and landscaping activities proposed on Parcels 3 and 4 (the proposed open space parcels west of Studebaker Road) would not include use of heavy construction equipment.

Utilities and Service Systems

Page 138

A majority of the City's wastewater is delivered to the Joint Water Pollution Control Plant (JWPCP) of the Los Angeles County Sanitation Districts (~~LACSD~~ Districts). The remaining portion is delivered to the Long Beach Water Reclamation Plant (LBWRP) of the ~~LACSD~~ Districts. The JWPCP provides advanced primary and partial secondary treatment for ~~260~~ 261.1 million gallons of wastewater per day (MGD), with a permitted capacity for 400 MGD of wastewater, ~~(LACSD 2018a),~~ resulting in an available capacity of ~~140~~ 138.9 MGD (Districts 2019). The LBWRP provides primary, secondary, and tertiary treatment for 25 MGD of wastewater (~~LACSD 2018b~~ Districts 2018).

~~Assuming that 100 percent of the proposed project's water use would be treated as wastewater, 35.6 million gallons per year (approximately~~ Based on the Districts' generation rates the proposed project would generate ~~97,534~~ 7,155 gallons of wastewater per day or ~~0.1~~ 0.007 MGD), which represents approximately ~~0.07~~ 0.005 percent of the remaining daily capacity of ~~140~~ 138.9 MGD of wastewater at the JWPCP (Districts 2019). The proposed project would not require the construction of new treatment facilities as the JWPCP would have adequate capacity to treat the wastewater produced by the proposed project. Impacts would be less than significant.

In addition, as discussed in the Will Serve Letter, prepared by the Long Beach Water Department, dated May 24, 2019 (Appendix M), the project includes a sewer line extension, measuring roughly 1,000 linear feet (lf), which would be located along the public right-of-way of Loynes Drive. See also Figure 10. Storm drain lines and surface swales would convey drainage to two existing facilities located at the south east and south west portions of the property. Domestic water and fire flow would be taken from an existing 12-inch line in Studebaker Road.

The project site is located outside the service area and jurisdictional boundaries of the Districts and will require annexation into District No. 3 prior to service. The proposed sewer line extension would convey wastewater to the nearest Districts' trunk sewer, the Marina Trunk Sewer Section 4, located in public right-of-way on the west side of Pacific Coast Highway north of 2nd Street. The Districts' 15-inch diameter trunk sewer has a capacity of 1.4 million gallons per day (mgd) and conveyed a peak flow of 0.8 mgd when last measured in 2017 (Districts 2019).

Under the California Health and Safety Code, the Districts charge connection fees to the District's Sewerage System for increasing the strength or quantity of wastewater discharged from connected facilities. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System and to accommodate proposed development. As such, the project applicant would be required to pay a sewer connection fee prior to the issuance of a sewer connection permit which would offset any project impacts to the sewer system.

Page 139

~~As discussed under impact discussion 19(*a*). of this section, the proposed project would create demand for an estimated 35.6 million gallons of wastewater per year according to CalEEMod estimations (Appendix A, Air Quality/Greenhouse Gas Modeling Results). Assuming that 100 percent of this water use would be treated as wastewater, 36.5 million gallons per year (approximately~~ Based on Districts' wastewater generation rates the proposed project would generate ~~97,534~~ 7,155 gallons per day or ~~0.1~~ 0.007 MGD) represents approximately ~~0.07~~ 0.005 percent of the remaining daily capacity of ~~140~~ 138.9 MGD of wastewater at the JWPCP (Districts 2019). The proposed project would not require the construction of new treatment facilities as the JWPCP would have adequate capacity to treat the wastewater produced by the proposed project. Impacts would be less than significant.

Page 140

~~As discussed under impact discussion 19(*a*). of this section, the proposed project would create demand for an estimated 35.6 million gallons of wastewater per year according to CalEEMod estimations (Appendix A, Air Quality/Greenhouse Gas Modeling Results). Assuming that 100 percent of this water use would be treated as wastewater, 36.5 million gallons per year (approximately~~ Based on Districts' wastewater generation rates the proposed project would generate ~~97,534~~ 7,155 gallons per day or ~~0.1~~ 0.007 MGD) represents approximately ~~0.07~~ 0.005 percent of the remaining daily capacity of ~~140~~ 138.9 MGD of wastewater at the JWPCP (Districts 2019).

References

Los Angeles County Sanitation Districts (Districts). 2019. NOI Response for the 300 Studebaker Road Industrial Park Project. October 7, 2019.

3 Mitigation Monitoring and Reporting Program

This document is the Mitigation Monitoring and Reporting Program (MMRP) for the 300 Studebaker Road Industrial Park Project (proposed project) proposed in the City of Long Beach. The purpose of the MMRP is to ensure that the required mitigation measures identified in the Initial Study – Mitigated Negative Declaration (IS-MND) are implemented as part of the overall project implementation. In addition, the MMRP provides feedback to agency staff and decision-makers during project implementation and identifies the need for enforcement action before irreversible environmental damage occurs.

The following table summarizes the mitigation measures for each issue area identified in the IS-MND for the proposed project. The table identifies the actions required for the measure to be implemented, the time at which the monitoring is to occur, the monitoring frequency, and the agency or party responsible for ensuring that the monitoring is performed. In addition, the table includes columns for compliance verification. These columns will be filled out by the monitoring agency or party and would document monitoring compliance. Where an impact was identified to be less than significant, no mitigation measures were required.

This MMRP will be used by City staff or the City's consultant to determine compliance with permit conditions. Violations of these conditions may cause the City to revoke the operating permit.

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
Aesthetics							
AES-1 Outdoor Lighting Plan Prior to issuance of building permits for the project, the project Applicant shall submit a photometric plan to the Department of Development Services demonstrating that the project will be designed and shielded so that the project's contribution of nighttime lighting shall be no greater than 0.10 foot-candles at the edge of the Los Cerritos Wetlands.	Applicant shall demonstrate in photometric plan that the project will be designed and shielded so that the project's contribution of nighttime lighting shall be no greater than 0.10 foot-candles at the edge of the Los Cerritos Wetlands	Review and verification of photometric plan prior to issuance of any building permit	Review and verification once prior to issuance of any building permit	City of Long Beach Department of Development Services			
Biological Resources							
BIO-1 Pre-construction Nesting Bird Surveys and Avoidance If initial clearing activities prior to the start of construction take place during the bird nesting season (generally February 1 through August 31, but variable based on seasonal and annual climatic conditions), a nesting bird survey should be performed by a qualified biologist within seven days of such activities to determine the presence/absence, location, and status of any active nests on-site or within 100 feet of the site. The findings of the survey should be summarized in a report to be submitted to the City of Long Beach prior to undertaking construction activities at the site. If nesting birds are found on-site, a construction buffer of 500 feet for nesting raptors or threatened or endangered species and 100 feet of all other nesting birds should be implemented around the active nests and demarcated with fencing or flagging. Nests should be monitored at a minimum of once per week by the qualified biologist until it	Verify that construction is scheduled outside of the bird breeding season; if construction is to occur during the bird breeding season, verify and review completion of a nesting bird survey and review survey results; if nests are found, field verify compliance with established buffer	Review and verification prior to issuance of any construction permit; field verification during construction.	Review and verification once prior to issuance of any construction permit; field verification periodically during construction	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
has been determined that the nest is no longer being used by either the young or adults. No ground disturbance should occur within this buffer until the qualified biologist confirms that the breeding/nesting is completed and all the young have fledged. If project activities must occur within the buffer, they should be conducted at the discretion of the qualified biologist. If no nesting birds are observed during pre-construction surveys, no further actions would be necessary.							
Cultural Resources							
CR-1 Unanticipated Discovery of Cultural Resources If cultural resources are encountered during ground-disturbing activities, work in the immediate area shall be halted and an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work such as data recovery excavation and Native American consultation and archaeological monitoring may be warranted to mitigate any significant impacts to cultural resources.	If cultural resources encountered on-site during ground-disturbing activities, verify that construction activities are halted and that the find is evaluated by a qualified paleontologist	Field verification during construction	Field verification during construction	City of Long Beach Department of Development Services			
Geology and Soils							
GEO-1 Liquefiable Soils Prior to the proposed ground improvement technique as recommended in the site-specific Geotechnical investigation (Appendix F), consisting of vibro-replacement stone columns, copies of the preliminary grading and foundation plans shall be provided to a geotechnical engineer for review. A deep foundation system shall be built from the medium dense to very dense, non-liquefiable soils present at depths between 32 and at least 51 ½ feet, to support the proposed structures. The deep foundation shall be	Review of grading and foundation plans by geotechnical engineer; implementation of deep foundation system	Review prior to implementation of ground improvement technique; implementation of deep foundation system during construction	Review and implementation once prior to issuance of any building permit	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
embedded at least five feet within non-liquefiable, low compressibility, suitable bearing soils. The existing soils in the proposed building area shall be overexcavated to a depth of at least 1 foot below the proposed building pad subgrade elevation and to a depth of at least 1 foot below the existing grade, whichever is greater. The overexcavation areas shall be extend at least 5 feet beyond the building perimeters. Following completion of the overexcavation, the subgrade soils within the building area shall be evaluated by a geotechnical engineer to verify the suitability to serve as the structural fill subgrade.							
GEO-2 Expansive Soils As referenced in the project specific Geotechnical Investigation (Appendix F), a structural engineer shall be retained to determine the floor slab reinforcement required for the proposed buildings based on the imposed slab loading and the potential liquefaction settlements. The minimum floor slab reinforcement shall consist of No. 3 rebars at 18-inches on center in both directions to account for the presence of low to medium expansive soils. Structural floor slab supported on the deep foundation system shall be at minimum five inches thick. Materials with high expansion potential, low strength, poor gradation or containing organic materials may require removal from the site or selective placement and/or mixing to the satisfaction of the Geotechnical Engineer. Bare soil within five feet of proposed structures shall be sloped at a minimum five percent gradient away from the structure (about three inches of fall in five feet), or the same area could be paved with a minimum surface gradient of one percent. Additional expansion index testing shall be conducted at the completion of rough grading to verify the expansion potential of the as-graded building pad. All soils shall be evaluated and tested by the Geotechnical Engineer.	Determination of the floor slab reinforcement required by structural engineer; evaluation and testing of soils by geotechnical engineer	Determination of the floor slab reinforcement required prior to construction; evaluation and testing of soils prior to construction	Determination floor slab reinforcement and evaluation of soils once prior to issuance of any building permit	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
GEO-3 Unanticipated Discovery of Paleontological Resources In the event an unanticipated fossil discovery is made during the course of project development, then in accordance with SVP (2010) guidelines, it is the responsibility of any worker who observes fossils within the project site to stop work in the immediate vicinity of the find and notify a qualified professional paleontologist who shall be retained to evaluate the discovery, determine its significance and if additional mitigation or treatment is warranted. Work in the area of the discovery will resume once the find is properly documented and authorization is given to resume construction work. Any significant paleontological resources found during construction monitoring will be prepared, identified, analyzed, and permanently curated in an approved regional museum repository.	If paleontological resources are discovered on-site during construction, verify that construction activities are halted and the find is evaluated by a qualified paleontologist	Field verification during construction	Field verification during construction	City of Long Beach Department of Development Services			
Hazards and Hazardous Materials							
HAZ-1 Existing Toxic/Hazardous Materials Removal of residual large-diameter pipelines shall be performed on-site, as well as abatement of related material that may have become entrained in surrounding soils. If additional ACMs are found to be present, all asbestos removal operations shall be performed by a California Division of Occupational Safety and Health (Cal/OSHA-DOSH)-registered and California-licensed asbestos contractor. All disturbance of ACMs, and/or abatement operations, shall be performed under the surveillance of a third-party Cal/OSHA Certified Asbestos Consultant. All disturbances of ACMs, and/or abatement operations, shall be performed in accordance with the Cal/OSHA requirements set forth in 8 CCR 1529. Given the location of the project site, all asbestos abatement must also be performed in accordance with SCAQMD requirements set forth in Rule 1403 as well as all other applicable State and federal rules and regulations. In addition, methane sampling shall be implemented throughout the eastern project area	Removal of residual pipelines and abatement of associated material; asbestos abatement; methane sampling in eastern section of the project site	Prior to issuance of any demolition permits	Once prior to the issuance of any demolition permits	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
of the project site, in order to account for the lack of specific information associated with the prior sampling. Contingency plans shall be in place to manage the removal and appropriate disposal of unanticipated subsurface infrastructure that could be encountered during site grading activities.							
HAZ-2 Soil Management Plan No ground-disturbing activities shall be allowed on the project site without a Soil Management Plan prepared by the project Applicant and approved by the Department of Toxic Substances Control. In order to mitigate any potentially significant impacts pertaining to RECs and OEFs present on-site, any soil brought to the surface by grading, excavation, trenching, or backfilling shall be managed in accordance with all applicable provisions of state and federal law. In order to verify compliance with the LUC, annual inspections and annual reporting requirements shall be enforced by the City.	Preparation of a Soil Management Plan; approval by Department of Toxic Substances Control; annual inspections and reporting to verify LUC compliance	Preparation and approval of a Soil Management Plan prior to ground-disturbing activities; annual inspections and reporting	Preparation and approval of a Soil Management Plan once prior to ground-disturbing activities; annual inspections and reporting	City of Long Beach Department of Development Services			
Noise							
NOI-1 Construction Noise Reduction Prior to Grading Permit issuance, the Applicant shall demonstrate, to the satisfaction of the City of Long Beach City Engineer, that the project complies with the following measures to reduce construction-related noise. ▪ Property owners and occupants located within 100 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City of Long Beach Development Services Department, prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and telephone number where residents can inquire about the construction process and register	Applicant shall provide notice of construction to properties within 100 feet of the project boundary, designate a Noise Disturbance Coordinator and provide evidence that construction noise reduction measures will be used prior to construction; Applicant shall equip stationary	Provide notice of construction, designate a Noise Disturbance Coordinator and demonstrate use of construction noise reduction measures prior to issuance of construction permits; Equip stationary equipment with mufflers, direct	Provide notice of construction, designate a Noise Disturbance Coordinator and demonstrate use of construction noise reduction measures once prior to issuance of construction permits; Equip stationary equipment with mufflers, direct equipment away from sensitive				

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
complaints. ▪ Prior to the issuance of any Grading or Building Permit, the contractor shall provide evidence that a construction staff member will be designated as a Noise Disturbance Coordinator and will be present during on-site construction activities. The Noise Disturbance Coordinator shall be responsible for responding to any local complaints about construction noise. When a noise complaint is received, the Noise Disturbance Coordinator shall notify the City within 24-hours of the complaint and determine the cause of the noise complaint and shall implement reasonable measures to resolve the complaint, as deemed acceptable by the City of Long Beach City Engineer. All notices that are sent to residential units immediately surrounding the construction site and all signs posted at the construction site shall include the contact name and the telephone number for the Noise Disturbance Coordinator. ▪ Prior to the issuance of any Grading or Building Permit, the project applicant shall demonstrate to the satisfaction of the City of Long Beach City Engineer that construction noise reduction methods shall be sued where feasible. These reduction methods include shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and electric air compressors and similar power tools. ▪ During all excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. ▪ The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receivers (e.g., residences and wildlife) nearest to the project site.	equipment with mufflers, place stationary equipment so that emitted noise is directed away from sensitive receptors and stage equipment to avoid impacting sensitive receptors during construction; Avoidance of nesting birds during construction	equipment away from sensitive receptors, stage equipment to avoid impacting sensitive receptors and avoid nesting birds during construction	receptors, stage equipment to avoid impacting sensitive receptors and avoid nesting birds throughout construction process				

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
▪ The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers (e.g., residences and wildlife) during all project construction. ▪ No construction shall occur within 500 feet of nesting raptors or threatened or endangered species and 100 feet of all other nesting birds protected by the federal Migratory Bird Treaty Act.							
Tribal Cultural Resources							
TR-1 Retain a Native American Monitor/Consultant The Project Applicant shall be required to retain and compensate for the services of a Tribal monitor/consultant who is both approved by the Gabrieleño Band of Mission Indians-Kizh Nation Tribal Government and is listed under the NAHC's Tribal Contact list for the area of the project location. This list is provided by the NAHC. The monitor/consultant will only be present on-site during the construction phases that involve ground disturbing activities. Ground disturbing activities are defined by the Gabrieleño Band of Mission Indians-Kizh Nation as activities that may include, but are not limited to, pavement removal, pot-holing or auguring, grubbing, tree removals, boring, grading, excavation, drilling, and trenching, within the project area. The Tribal Monitor/consultant will complete daily monitoring logs that will provide descriptions of the day's activities, including construction activities, locations, soil, and any cultural materials identified. The on-site monitoring shall end when the project site grading and excavation activities are completed, or when the Tribal Representatives and monitor/consultant have indicated that the site has a low potential for impacting Tribal Cultural Resources.	Verify that an approved Tribal monitor/ consultant has been obtained, verify completion of daily monitoring logs during the construction phase when ground disturbing activities occur.	Prior to issuance of grading permits; continuous during construction activities.	Once at plan check; periodically throughout construction	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
TR-2 Unanticipated Discovery of Tribal Cultural and Archaeological Resources Upon discovery of any archaeological resources, cease construction activities in the immediate vicinity of the find until the find can be assessed. All archaeological resources unearthed by project construction activities shall be evaluated by the qualified archaeologist and tribal monitor/consultant approved by the Gabrieleño Band of Mission Indians-Kizh Nation. If the resources are Native American in origin, the Gabrieleño Band of Mission Indians-Kizh Nation shall coordinate with the landowner regarding treatment and curation of these resources. Typically, the Tribe will request reburial or preservation for educational purposes. Work may continue on other parts of the project while evaluation and, if necessary, mitigation takes place (CEQA Guidelines Section 15064.5 [f]). If a resource is determined by the qualified archaeologist to constitute a "historical resource" or "unique archaeological resource", time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available. The treatment plan established for the resources shall be in accordance with CEQA Guidelines Section 15064.5(f) for historical resources and Public Resources Code Sections 21083.2(b) for unique archaeological resources. Preservation in place (i.e., avoidance) is the preferred manner of treatment. If preservation in place is not feasible, treatment may include implementation of archaeological data recovery excavations to remove the resource along with subsequent laboratory processing and analysis. Any historic archaeological material that is not Native American in origin shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, they shall be offered to a local	Verify that appropriate procedures are followed if archaeological resources are identified during demolition, grading, and/or construction.	Periodically during grading and ground disturbing activities.	Periodically throughout grading and ground disturbing activities.	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
school or historical society in the area for educational purposes.							
TR-3 Unanticipated Discovery of Human Remains and Associated Funerary Objects Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in PRC 5097.98, are also to be treated according to this statute. Health and Safety Code 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and excavation halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC) and PRC 5097.98 shall be followed.	Verify that appropriate procedures are followed if human remains and/or associated funerary objects are identified during demolition, grading, and/or construction.	Periodically during grading and ground disturbing activities.	Periodically throughout grading and ground disturbing activities.	City of Long Beach Department of Development Services			
TR-4 Resource Assessment and Continuation of Work Protocol Upon discovery, the tribal and/or archaeological monitor/consultant/consultant will immediately divert work at minimum of 150 feet and place an exclusion zone around the burial. The monitor/consultant(s) will then notify the Tribe, the qualified lead archaeologist, and the construction manager who will call the coroner. Work will continue to be diverted while the coroner determines whether the remains are Native American. The discovery is to be kept confidential and secure to prevent any further disturbance. If the finds are determined to be Native American, the coroner will notify the NAHC as mandated by state law who will then appoint a Most Likely Descendent (MLD).	Verify that appropriate procedures are followed if human remains and/or associated funerary objects are identified during demolition, grading, and/or construction.	Periodically during grading and ground disturbing activities.	Periodically throughout grading and ground disturbing activities.	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
TR-5 Kizh-Gabrieleno Procedures for Burials and Funerary Remains If the Gabrieleño Band of Mission Indians – Kizh Nation is designated MLD, the following treatment measures shall be implemented. To the Tribe, the term "human remains" encompasses more than human bones. In ancient as well as historic times, Tribal Traditions included, but were not limited to, the burial of funerary objects with the deceased, and the ceremonial burning of human remains. These remains are to be treated in the same manner as bone fragments that remain intact. Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects.	Verify that appropriate procedures are followed if human remains and/or associated funerary objects, as defined by the Gabrieleno Band of Mission Indians – Kizh Nation (if designated as the MLD) are identified during demolition, grading, and/or construction.	Periodically during grading and ground disturbing activities.	Periodically throughout grading and ground disturbing activities.	City of Long Beach Department of Development Services			
TR-6 Treatment Measures Prior to the continuation of ground disturbing activities, the land owner shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects. In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains will be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed. The Tribe will work closely with the qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be taken which includes at a minimum	Verify that appropriate procedures are followed if human remains and/or associated funerary objects are identified during demolition, grading, and/or construction.	Periodically during grading and ground disturbing activities.	Periodically throughout grading and ground disturbing activities.	City of Long Beach Department of Development Services			

Mitigation Measure/Condition of Approval	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
detailed descriptive notes and sketches. Additional types of documentation shall be approved by the Tribe for data recovery purposes. Cremations will either be removed in bulk or by means as necessary to ensure completely recovery of all material. If the discovery of human remains includes four or more burials, the location is considered a cemetery and a separate treatment plan shall be created. Once complete, a final report of all activities is to be submitted to the Tribe and the NAHC. The Tribe does NOT authorize any scientific study or the utilization of any invasive diagnostics on human remains.							
Each occurrence of human remains and associated funerary objects will be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony will be removed to a secure container on site if possible. These items should be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location agreed upon between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered. Professional Standards: Archaeological and Native American monitoring and excavation during construction projects will be consistent with current professional standards. All feasible care to avoid any unnecessary disturbance, physical modification, or separation of human remains and associated funerary objects shall be taken. Principal personnel must meet the Secretary of Interior standards for archaeology and have a minimum of 10 years of experience as a principal investigator working with Native American archaeological sites in southern California. The Qualified Archaeologist shall ensure that all other personnel are appropriately trained and qualified.							

TRAFFIC IMPACT ANALYSIS

LONG BEACH BUSINESS PARK PROJECT

LONG BEACH, CALIFORNIA

This Traffic Impact Study has been prepared under the supervision of
Ambarish Mukherjee, P.E.

LSA

October 2019

TRAFFIC IMPACT ANALYSIS

LONG BEACH BUSINESS PARK PROJECT

LONG BEACH, CALIFORNIA

Submitted to:

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Project No. ULL1801

October 2019

EXECUTIVE SUMMARY

LSA Associates, Inc. (LSA) has prepared this Traffic Impact Analysis (TIA) to identify the short-term traffic impacts resulting from the development of the proposed Long Beach Business Park Project (project) in Long Beach, California. LSA has prepared this analysis with the objectives and methodologies set forth in the City of Long Beach TIA Guidelines, the 2010 Congestion Management Program for Los Angeles County, and applicable provisions of the California Environmental Quality Act.

The project is located east of Studebaker Road and Loynes Drive in Long Beach, California. The project proposes a total of approximately 139,500 square feet (sf), including warehouse (118,500 sf) and office use (21,000 sf) within two buildings on the project site. Access to the project site will be provided via a new driveway, creating the fourth leg of the signalized intersection of Studebaker Road/Loynes Drive, and a second access driveway along Studebaker Road that is right in and right out only. The project is proposed for construction by 2020.

This study analyzes the a.m. and p.m. peak-hour levels of service during a typical weekday the study area intersections. Project impacts were determined based on the analysis of the following scenarios, consistent with City of Long Beach (City) requirements:

1. Existing
2. Existing Plus Project
3. Project Build-Out Year (2020) Plus Cumulative Projects
4. Project Build-Out Year (2020) Plus Cumulative Projects Plus Project

Based on the results of this TIA, the proposed project would not significantly affect the study area intersections in either the existing or project build-out year (cumulative) horizon, based on the City's performance criteria.

An evaluation of the project build-out year conditions was also made based on the City's proposed road diet along Loynes Avenue. As a result, the project would not significantly impact the study area intersections with Loynes Avenue that have been reduced from four lanes to two lanes.

The project proposes the following project design features:

- Provide one single-lane ingress and egress at the project driveway at the Studebaker Road/Loynes Drive intersection. In addition, a southbound left-turn pocket and left-turn lane on Studebaker Road would be constructed. The inside eastbound right-turn lane on Loynes Drive would be converted to an eastbound through lane for vehicles entering the project site from Loynes Drive. The existing outer right turn lane on Loynes Drive will remain a right-turn lane.

- Provide one right-in/right-out only driveway at the northern end of the project, providing access to Studebaker Road.

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F: LOYNES DRIVE ROAD DIET LOS CALCULATION WORKSHEETS

LIST OF ABBREVIATIONS AND ACRONYMS

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Long Beach
CMP	Congestion Management Program
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
LOS	level(s) of service
mph	miles per hour
OCTA	Orange County Transportation Authority
PCE	passenger car equivalent
PCH	East Pacific Coast Highway
project	Long Beach Business Park Project
sf	square feet
SR-22	State Route 22
TIA	Traffic Impact Analysis
v/c	volume to capacity
vph	vehicles per hour

INTRODUCTION

The purpose of this Traffic Impact Analysis (TIA) is to identify the potential circulation impacts associated with the development of the Long Beach Business Park Project in Long Beach, California. Figure 1 shows the location of the project site and the study area intersection analyzed in this report.

Issues addressed in this analysis include the operation of the existing roadway system in the area, local off-site intersection impacts, site access, and internal circulation. The traffic analysis for the proposed project examines four scenarios:

1. Existing
2. Existing Plus Project
3. Project Build-Out Year (2020) Plus Cumulative Projects
4. Project Build-Out Year (2020) Plus Cumulative Projects Plus Project

In addition, an alternative project build-out year analysis was conducted to evaluate the project's impact based on a City-proposed road diet along Loynes Drive.

LSA prepared the TIA based on the City of Long Beach's (City) general requirements for traffic studies.

Project Description

The proposed project considers the development of 139,500 square feet (sf) of warehouse use (118,500 sf) and office use (21,000 sf) within two buildings on the east side of Studebaker Road at Loynes Drive. Figure 2 shows the site plan for the proposed business park project.

The Long Beach Business Park Project would create a four-leg signalized intersection at Studebaker Road/Loynes Drive. This intersection would consist of a new protected left-turn phase in the southbound direction with a new southbound left-turn pocket along Studebaker Road. A second access driveway that would be right in and right out only would also be created on the north end of the project site.

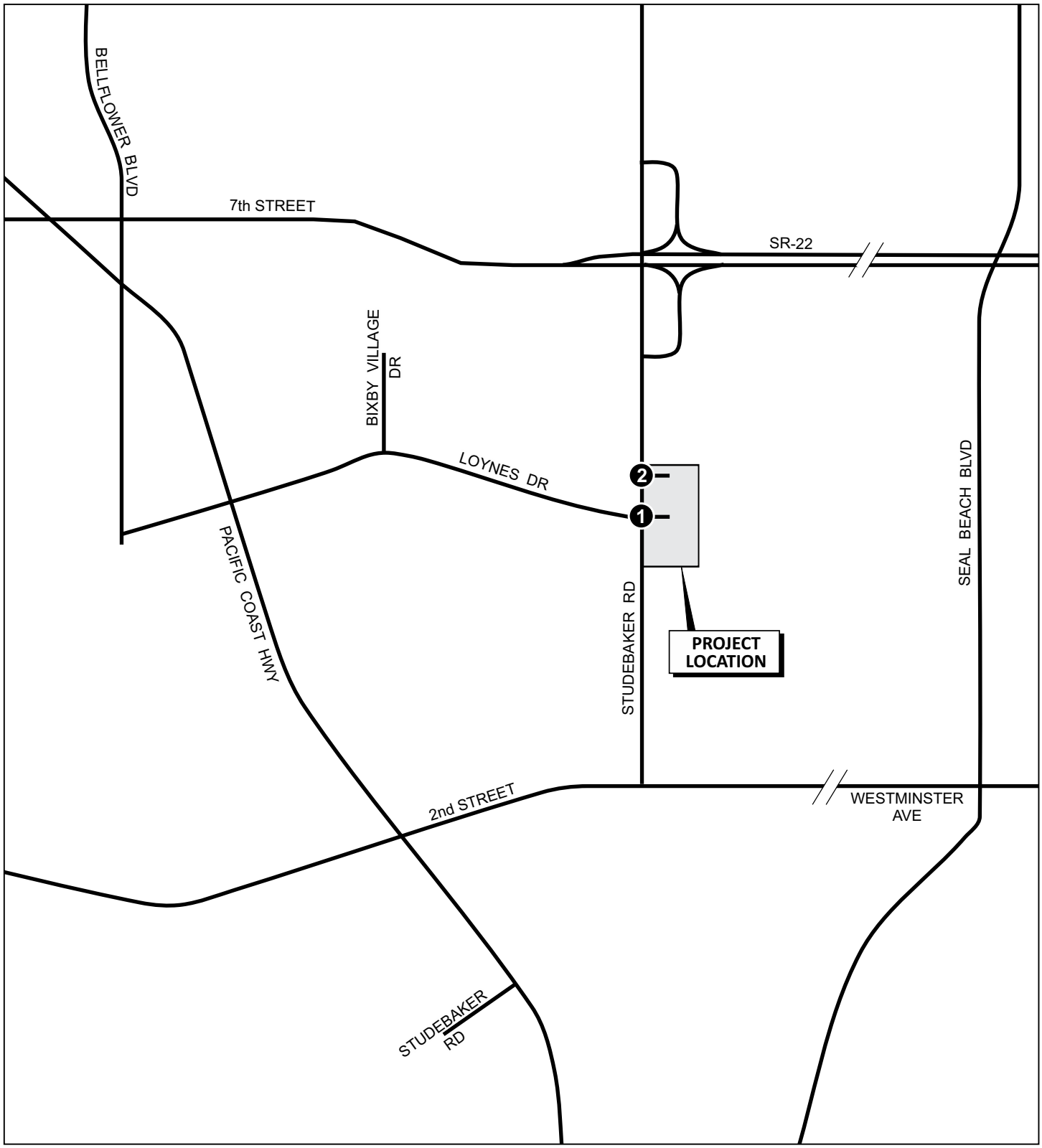
METHODOLOGY

This TIA's format is consistent with the objectives and methodologies set forth in the City of Long Beach TIA Guidelines, the 2010 Congestion Management Program (CMP) for Los Angeles County, and applicable provisions of the California Environmental Quality Act (CEQA).

The City's Traffic Engineer reviewed and approved the scope of work, including the project study area, prior to the preparation of this analysis.

Intersection Capacity Utilization

LSA used the Intersection Capacity Utilization (ICU) methodology using Traffix (Version 8.0) software to calculate the levels of service (LOS) for the signalized study area intersection, consistent with the City's requirements. This methodology compares the volume-to-capacity (v/c) ratios of conflicting



LSA

FIGURE 1

LEGEND

1 - Study Area Intersections

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SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Project Location and Study Area Intersections

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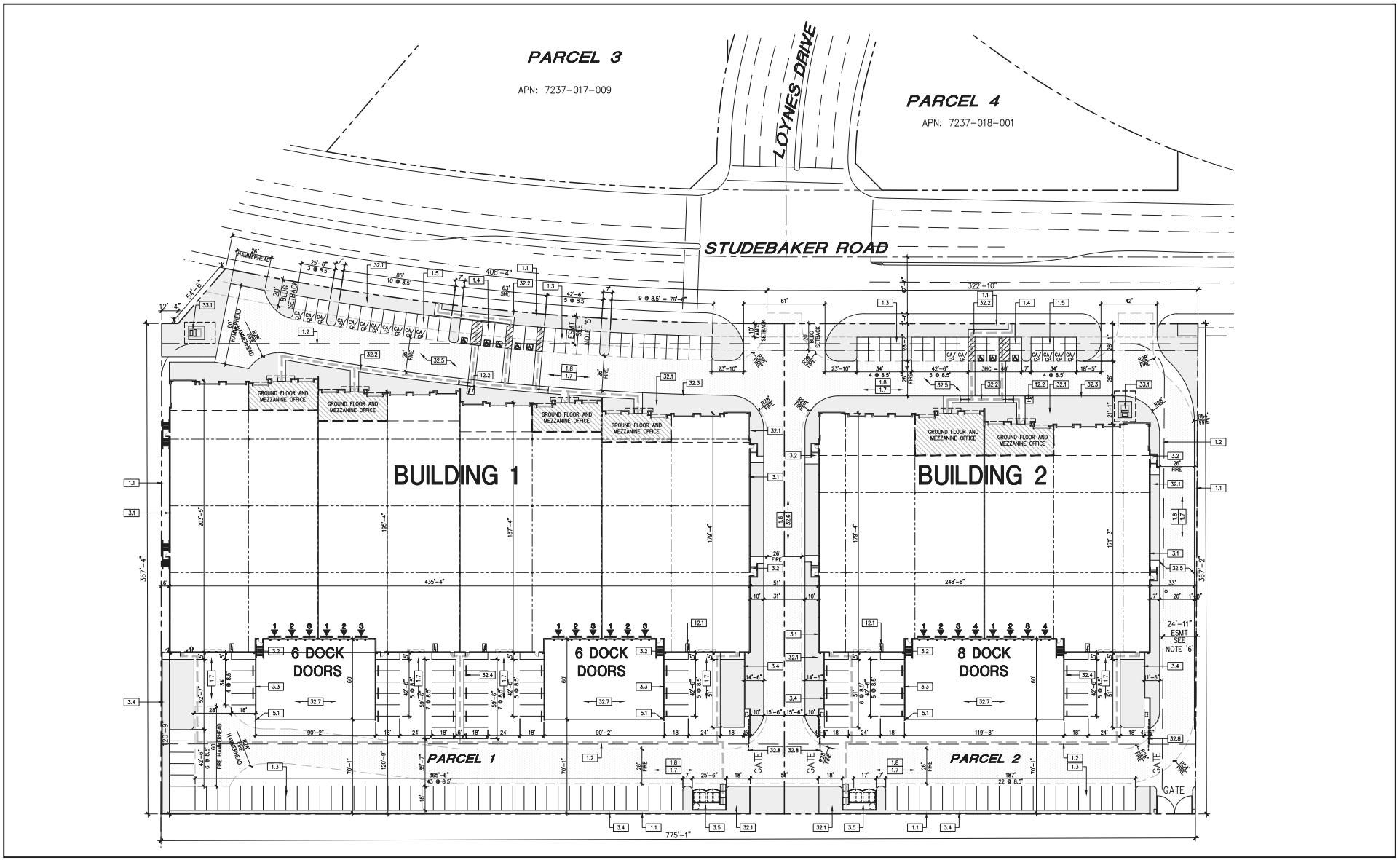

LSA

FIGURE 2

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0 35 70
FEET

SOURCE: GAA Architects

Long Beach Business Park
Site Plan

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turn movements at an intersection, sums these critical conflicting v/c ratios for each intersection approach, and determines the overall ICU. The resulting ICU is expressed in terms of LOS, where LOS A represents free-flow activity, and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations. The following presents LOS criteria for signalized intersections using the ICU methodology.

LOS	Description
A	No approach phase is fully utilized by traffic, and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily, and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized, and a substantial number are nearing full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, speed can drop to zero.

LOS = level of service

The relationship between LOS and the ICU value (i.e., v/c ratio) is as follows:

Level of Service	Intersection Capacity Utilization
A	< 0.601
B	0.601–0.700
C	0.701–0.800
D	0.801–0.900
E	0.901–1.000
F	> 1.000

Consistent with the City's requirements, the ICU calculations use a lane capacity value of 1,600 vehicles per hour (vph) per lane, and a dual turn lane capacity of 2,880 vph. Based on the City's requirements, a clearance adjustment factor of 0.10 was added to each LOS calculation.

The City considers intersections with an ICU of 0.90 (LOS D) as the upper limit of satisfactory operations. A project impact at an intersection is considered significant if the intersection operates at an unsatisfactory LOS (LOS E or F) and the project increases the ICU by 2 percent or higher (ICU > 0.02), or the project traffic causes the intersection to deteriorate from LOS D to LOS E or F.

Highway Capacity Manual (HCM) Methodology

LSA used the *Highway Capacity Manual Sixth Edition* (HCM) methodology using Synchro (Version 10) software to determine intersection LOS at the signalized intersection at Studebaker Road and Loynes Drive and for the unsignalized intersection at Studebaker Road and Driveway 2. The HCM analysis was used to evaluate new signal timing and potential queuing of the new southbound left-turn lane on Studebaker Road. The HCM signalized intersection methodology describes LOS in terms of overall control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and the delay (in seconds) at signalized and unsignalized intersections is as follows:

Level of Service	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	≤10.0	≤10.0
B	>10.0 and ≤20.0	>10.0 and ≤15.0
C	>20.0 and ≤35.0	>15.0 and ≤25.0
D	>35.0 and ≤55.0	>25.0 and ≤35.0
E	>55.0 and ≤80.0	>35.0 and ≤50.0
F	>80.0	>50.0

Source: *Highway Capacity Manual 6th Edition* (Transportation Research Board 2016).

Study Intersections

Intersections at which the project would contribute a total of 50 or more peak-hour trips should be included in the study area, based on the City's TIA guidelines. The project would not contribute 50 or more peak-hour trips to any intersections north, south, or west of the project driveway.

The study area analyzed in this report includes the following intersections per the City Traffic Engineer:

1. Studebaker Road/Loynes Drive
2. Studebaker Road/Driveway Access 2

Figure 3 provides the existing geometrics and traffic control devices at the study intersection.

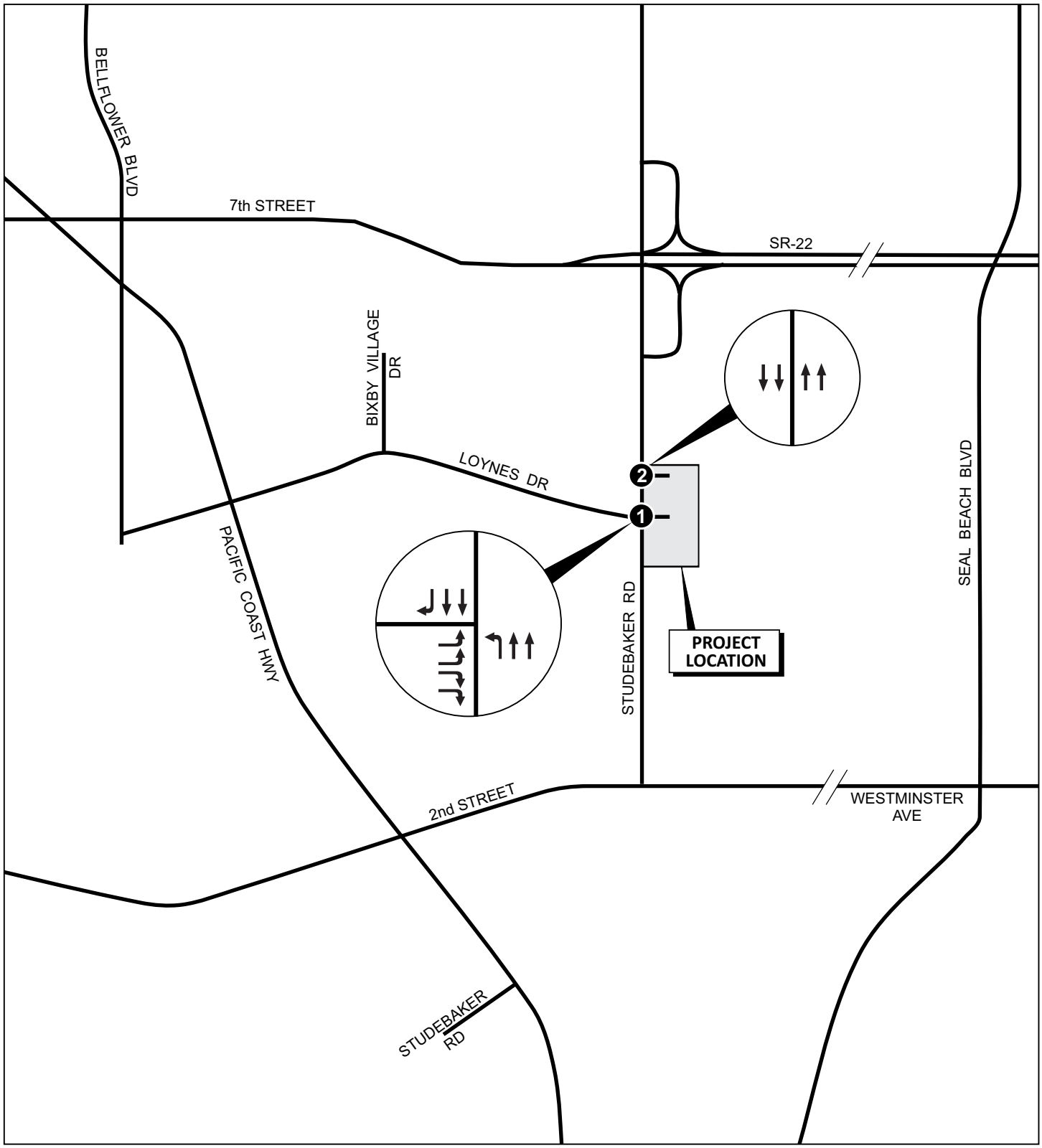
EXISTING CONDITIONS

Existing Circulation System

Key roadways in the vicinity of the proposed project are as follows:

- **State Route 22.** The freeway portion of State Route 22 (SR-22) runs northeast of the project site. This extension of 7th Street becomes a state route at PCH and extends through Orange County. Access to the project site from the SR-22 freeway is provided via eastbound and westbound on/off-ramps at Studebaker Road. SR-22 is also classified as a State Freeway in the 2010 CMP for Los Angeles County.

- **Pacific Coast Highway.** PCH is west of the project site and is a Regional Corridor that extends throughout Los Angeles and Orange counties. Access to the project site from PCH is provided via 2nd Street and Loynes Drive. This arterial is classified as a Regional Corridor in the City's Transportation Element. PCH is also classified as a State Highway (Arterial) in the 2010 CMP for Los Angeles County.



LSA

FIGURE 3

LEGEND

1 - Study Area Intersections

- Directional Travel Lane

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Existing Intersection Geometry

I:\ULL1801\G\Existing Geometrics.cdr (10/17/2018)

- **Studebaker Road:** Studebaker Road is a four-lane, north-south roadway abutting the project and parallel to the Los Cerritos Channel. The route is classified as a Major Arterial by the City of Long Beach Mobility Element. The roadway also provides direct access to Interstate 405 and SR-22. Studebaker Road begins at 2nd Street in Long Beach and extends to Los Coyotes Diagonal south of Lakewood.
- **Loynes Drive:** Loynes Drive is an east-west roadway adjacent to and west of the project that spans from Studebaker Road to Bellflower Boulevard in Long Beach. Within the study area, Loynes Drive will provide access to the project site at the signalized T-intersection of Studebaker Road and Loynes Drive.
- **2nd Street:** 2nd Street is a six-lane east-west arterial south of the project site. It is classified as a Major Arterial (Scenic Route) within the city limits. This arterial's name changes to Westminster Avenue at the Orange County line. 2nd Street becomes a four-lane arterial east of Studebaker Road.
- **Bellflower Boulevard.** Bellflower Boulevard is a six-lane north-south arterial northwest of the project site. The City's Transportation Element classifies this roadway as a Major Arterial.
- **7th Street**: 7th Street is a six-lane east-west arterial northwest of the project site. This arterial transitions into SR-22 east of PCH and is classified as a Major Arterial.

Existing Traffic Volumes

National Data and Surveying Services collected the weekday peak-hour intersection turn volumes for the study intersection of Studebaker Road and Loynes Drive in September 2018. Vehicle classification counts were conducted for the study area intersection on Loynes Drive and Studebaker Road, which included passenger cars, two-axle trucks, three-axle trucks, four-axle trucks, bicycles, and pedestrians. Figure 4 presents the existing a.m. and p.m. peak-hour volumes in passenger car equivalent (PCE) for the study area intersections. Appendix A provides the existing count data.

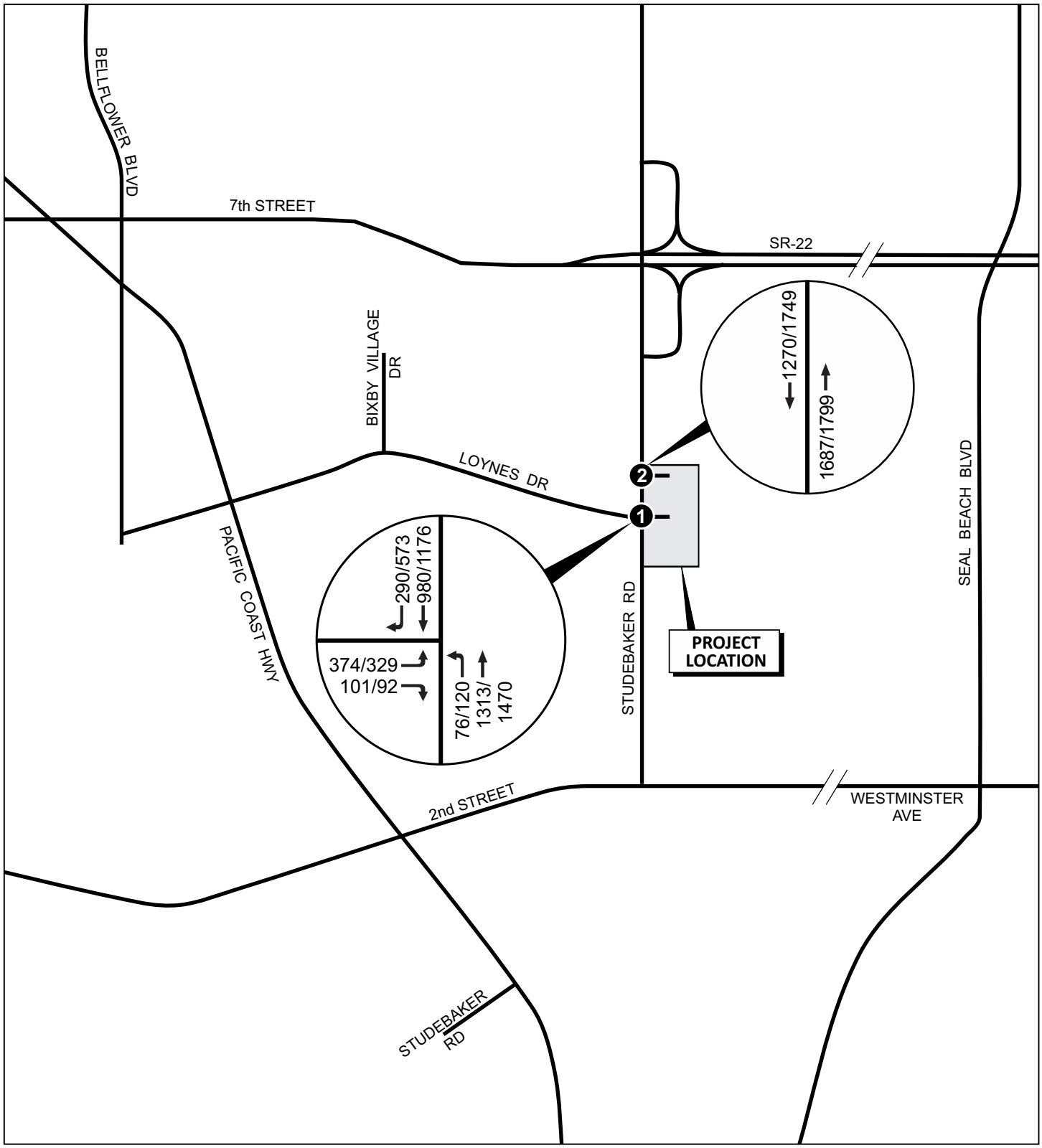
Existing Intersection Level of Service Analysis

Table A summarizes the results of the existing a.m. and p.m. peak-hour LOS analysis for the signalized study area intersection using the ICU and HCM methodologies. Appendix B provides the existing LOS calculation worksheets. As the table indicates, the study area intersection operates at an acceptable LOS during the a.m. and p.m. peak hours under both methodologies.

Table A: Existing Intersection LOS Summary

Intersection	Analysis Method	AM Peak Hour		PM Peak Hour	
		V/C or Delay	LOS	V/C or Delay	LOS
Studebaker Road/Loynes Drive	ICU	0.68	B	0.72	C
	HCM	10.8	B	13.2	B

Delay is reported in seconds (for HCM)
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
LOS = level of service
V/C = volume-to-capacity ratio (for ICU)



LSA

FIGURE 4

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Existing Peak Hour Traffic Volumes

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PROJECT BUILD-OUT YEAR (2020) CONDITIONS

According to the project applicant, the project is proposed for completion by 2020. To develop a cumulative (2020) project opening condition, traffic volumes for other committed and/or approved (cumulative) developments within this time frame were added to the existing baseline traffic volumes. LSA contacted the City to identify pending projects and committed improvements that could be constructed prior to the year 2020.

One cumulative project was identified in the cumulative condition based on discussions with the City of Long Beach Planning Department: the 2nd & PCH Project. This project proposes the development of a 245,000 sf shopping center consisting of 150,000 sf of retail, 70,000 sf of restaurant, and 25,000 sf of commercial personal service uses at the intersection of 2nd Street/PCH, southwest of the project site. Traffic generated by the project was assigned to Studebaker Road/Loynes Drive intersection using trip distribution assumptions as included in the 2nd Street + PCH Project Traffic Impact Analysis prepared by LLG (March 2017).

Table B shows the project trip generation for the pending project provided by the City. Figure 5 illustrates the cumulative project trip assignment.

Table B: Cumulative Project Trip Generation Summary

Land Use	Size	Unit	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rates[1]									
Shopping Center (820)		TE/1,000 sf	43	0.60	0.36	0.96	1.78	1.93	3.71
Quality Restaurant (931)		TE/1,000 sf	90	0.41	0.41	0.81	5.02	2.47	7.49
High-Turnover (Sit-Down) Restaurant (932)		TE/1,000 sf	127	5.95	5.95	10.81	5.91	3.94	9.85
Project Trip Generation									
1. 2nd Street + PCH Project									
Retail (820)	180	TE/1,000 sf	9,951	138	85	223	426	462	888
Quality Restaurant (931)	40	TE/1,000 sf	3,598	16	16	32	201	99	300
High-Turnover Restaurant (932)	25	TE/1,000 sf	3,179	149	121	270	148	99	246
Pass-By Reduction[2] – Retail			-995	-14	-9	-23	-145	-157	-302
Pass-By Reduction[2] – Quality Restaurant			-360	0	0	0	-88	-44	-132
Pass-By Reduction[2] – High-Turnover Restaurant			-318	0	0	0	-64	-42	-106
Total			**15,055**	**289**	**213**	**502**	**478**	**416**	**894**

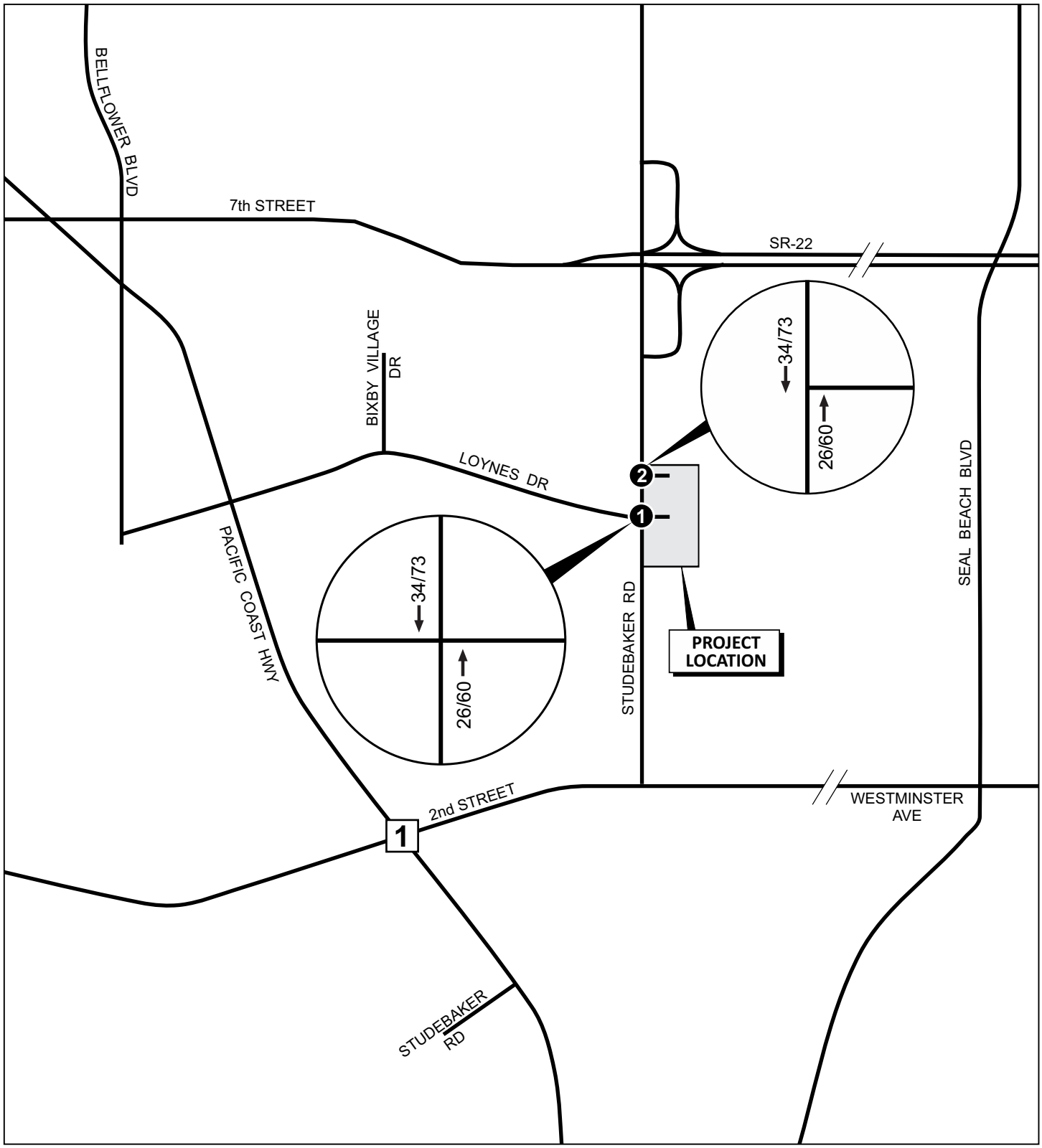
[1] Trip rates referenced from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition (2012).

[2] Trip rates referenced from the Institute of Transportation Engineers (ITE) Trip Generation Handbook (2012). Pass-by reductions for the retail, quality restaurant and high-turnover restaurant project are as follows:

- Retail: Weekday (Daily: 10%, AM: 10% and PM: 34%)
- Quality Restaurant: Weekday (Daily: 10%, AM: 0% and PM: 44%)
- High-Turnover Restaurant: Weekday (Daily: 0%, AM: 10% and PM: 43%)

Land Use Code (820) – Shopping Center
Land Use Code (931) – Quality Restaurant
Land Use Code (932) – High-Turnover (Sit-Down) Restaurant

ADT = average daily trips TE/1000 sf = Trip end per 1000 SF of development



LSA

FIGURE 5

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

CUMULATIVE PROJECTS:

1 - 2nd Street/PCH Project

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Cumulative Project Trips

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To determine the project build-out year without project traffic conditions, traffic generated by the approved/pending project was added to existing traffic PCE volumes at the study area intersection. An ambient growth rate of 1.52 percent per year for 2 years (3.04 percent) was also added to existing baseline traffic volumes to develop the cumulative conditions. The growth rate for this region was identified in the CMP for Los Angeles County (Appendix C). Figure 6 shows the resulting project build-out year without project a.m. and p.m. peak-hour traffic volumes.

Table C summarizes the results of the project build-out year a.m. and p.m. peak-hour LOS analysis for the signalized study area intersection using the ICU and HCM methodologies. The cumulative LOS calculation worksheets are contained in Appendix D. As this table indicates, all study area intersections are forecast to operate at an acceptable LOS (LOS D or better) in the peak hours.

Table C: Project Build-Out Year (2020) Level of Service Summary

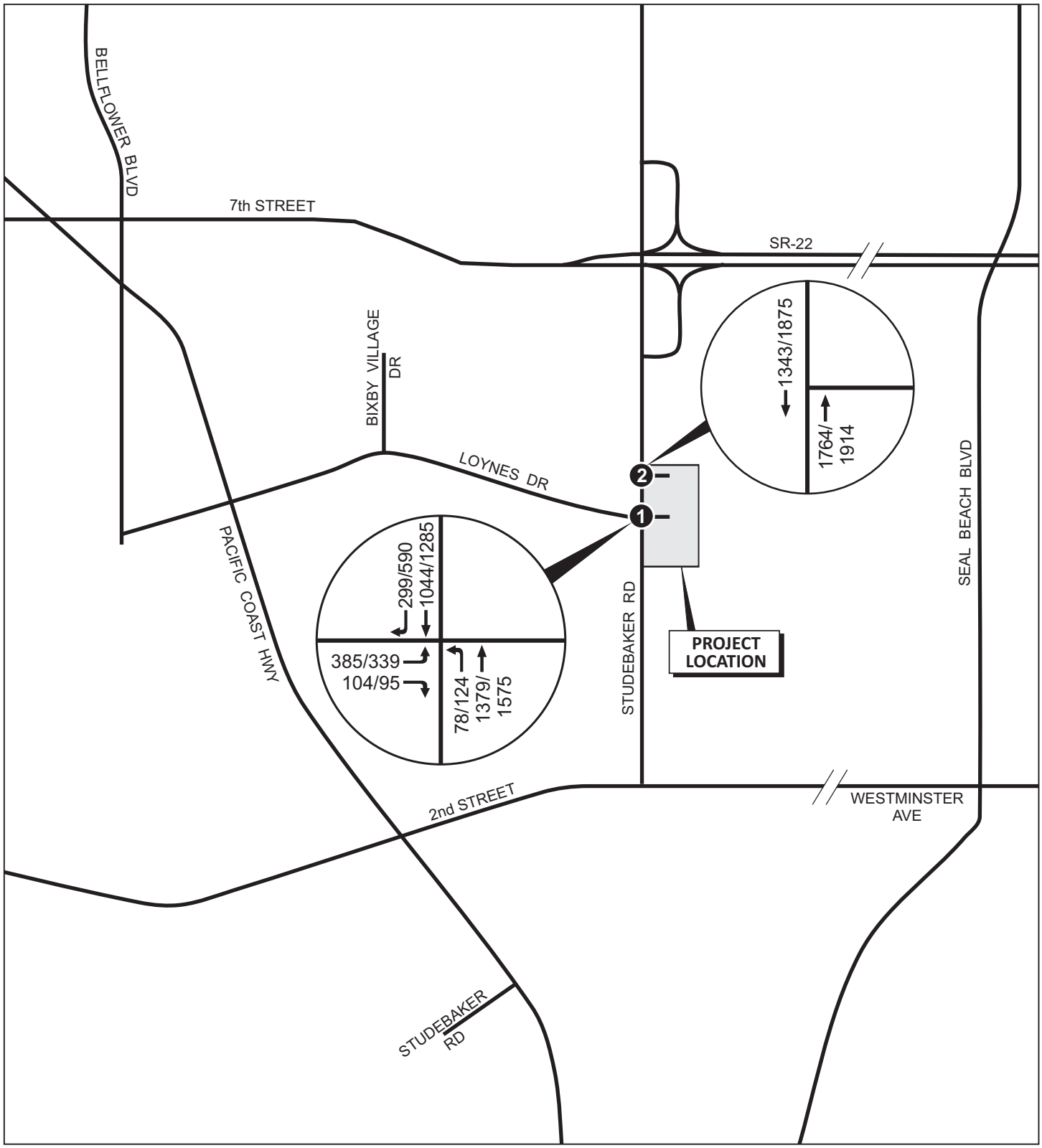
Intersection	Analysis Method	AM Peak Hour		PM Peak Hour	
		ICU / Delay	LOS	ICU / Delay	LOS
Studebaker Road/Loynes Drive	ICU	0.71	C	0.76	C
	HCM	11.3	B	13.8	B

Delay is reported in seconds (for HCM).
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
V/C = Volume-to-Capacity ratio (for ICU)

PROJECT CONDITION

Trip Generation

The daily and peak-hour trips for the proposed project were generated using trip rates from the Institute of Transportation Engineers *ITE Trip Generation Manual*, Tenth Edition (2017). It should be noted that the resulting project trips were converted to trucks and passenger vehicles based on the South Coast Air Quality Management District requirements for warehouse projects. The PCE volume is determined through application of a PCE factor to heavy vehicles. The PCE factor is a multiplier that is applied to the number of truck axles and can vary depending on the size of the truck. The PCE factors that were applied for this study were: 1.5 for two-axle trucks, 2.0 for three-axle trucks, and 3.0 for four or more-axle trucks (City of Fontana Truck Trip Generation Study, 2003). Using the ITE rates and PCE factors, the proposed project would generate 538 average daily trips, 57 a.m. peak-hour trips (46 in and 11 out), and 60 p.m. peak-hour trips (12 in and 48 out) in PCEs. Table D presents the resulting trip generation.



LSA

FIGURE 6

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Project Build-Out Year Plus Cumulative Projects Peak Hour Traffic Volumes

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Table D: Project Trip Generation

Land Uses	Units		A.M. Peak Hour			P.M. Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Warehouse[1]	**118.500**	**TSF**							
Trips/Unit (Cars)			0.077	0.025	0.102	0.029	0.085	0.114	1.044
Trips/Unit (2-Axle Trucks)			0.009	0.003	0.012	0.004	0.009	0.013	0.118
Trips/Unit (3-Axle Trucks)			0.012	0.003	0.015	0.005	0.012	0.017	0.158
Trips/Unit (4+ Axle Trucks)			0.032	0.009	0.041	0.012	0.034	0.046	0.420
Trips/Unit (Total)			*0.130*	*0.040*	*0.170*	*0.050*	*0.140*	*0.190*	*1.740*
Trip Generation (Cars)			9	3	12	3	11	14	124
Trip Generation (2-Axle Trucks)			1	0	1	0	2	2	14
Trip Generation (3-Axle Trucks)			1	1	2	1	1	2	19
Trip Generation (4+ Axle Trucks)			4	1	5	1	4	5	50
Trip Generation (Total)			*15*	*5*	*20*	*5*	*18*	*23*	*207*
Trip Generation (Cars)			9	3	12	3	11	14	124
PCE Trip Generation (2-Axle Trucks)			2	0	2	0	3	3	21
PCE Trip Generation (3-Axle Trucks)			2	2	4	2	2	4	38
PCE Trip Generation (4+ Axle Trucks)			12	3	15	3	12	15	150
PCE Trip Generation (Total)			**25**	**8**	**33**	**8**	**28**	**36**	**333**
Office	**21.000**	**TSF**							
Trips/Unit (Total)			1.000	0.160	1.160	0.180	0.970	1.150	9.740
Trip Generation (Total)			**21**	**3**	**24**	**4**	**20**	**24**	**205**
Total Project	**139.500**	**TSF**							
PCE Trip Generation			**46**	**11**	**57**	**12**	**48**	**60**	**538**

Note: Trip rates referenced from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 10th Edition (2017). Land Use Codes 150 (Warehousing) and 710 (General Office Building).

[1] The resulting trips were converted to trucks and passenger vehicles based on the South Coast Air Quality Management District (SCAQMD) requirements for warehouse projects. As such, 40% of warehouse traffic will be trucks. Based on the City of Fontana *Truck Trip Generation Study,* dated August 2003, the truck mix was considered as 60.34% 4-axle, 22.71% 3-axle, and 16.95% 2-axle trucks. Furthermore, all truck trips were converted to passenger car equivalents (PCEs) using a 1.5 PCE factor for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4- and more axle trucks.

TSF = thousand square-feet

Project Trip Distribution and Assignment

Trip distribution for the proposed project was based on logical travel corridors and minimum time paths. Project traffic volumes for vehicles both entering and exiting the project site were distributed and assigned to the adjacent street system based on the proximity to major arterials (i.e., SR-22, PCH, and Bellflower Boulevard) and residential neighborhoods.

As illustrated on Figure 7, approximately 70 percent of the trips would be north via Studebaker Road; 15 percent south via Studebaker Road; and 15 percent west via Loynes Drive. It should be noted that no trucks were assigned on Loynes Drive. The project traffic volumes were assigned to the adjacent street system based on the trip distribution percentages and total trip generation.

EXISTING PLUS PROJECT CONDITIONS

To determine existing plus project conditions, traffic generated by the proposed project was added to existing traffic volumes at the study area intersections. Figure 8 shows the roadway geometry in the plus project conditions. Figure 9 shows the resulting existing plus project a.m. and p.m. peak-hour traffic volumes at the study area intersection.

Table E summarizes the results of the existing plus project a.m. and p.m. peak hour LOS analysis for the study area intersections using the ICU and HCM methodologies. Appendix E provides the existing plus project LOS calculation worksheets.

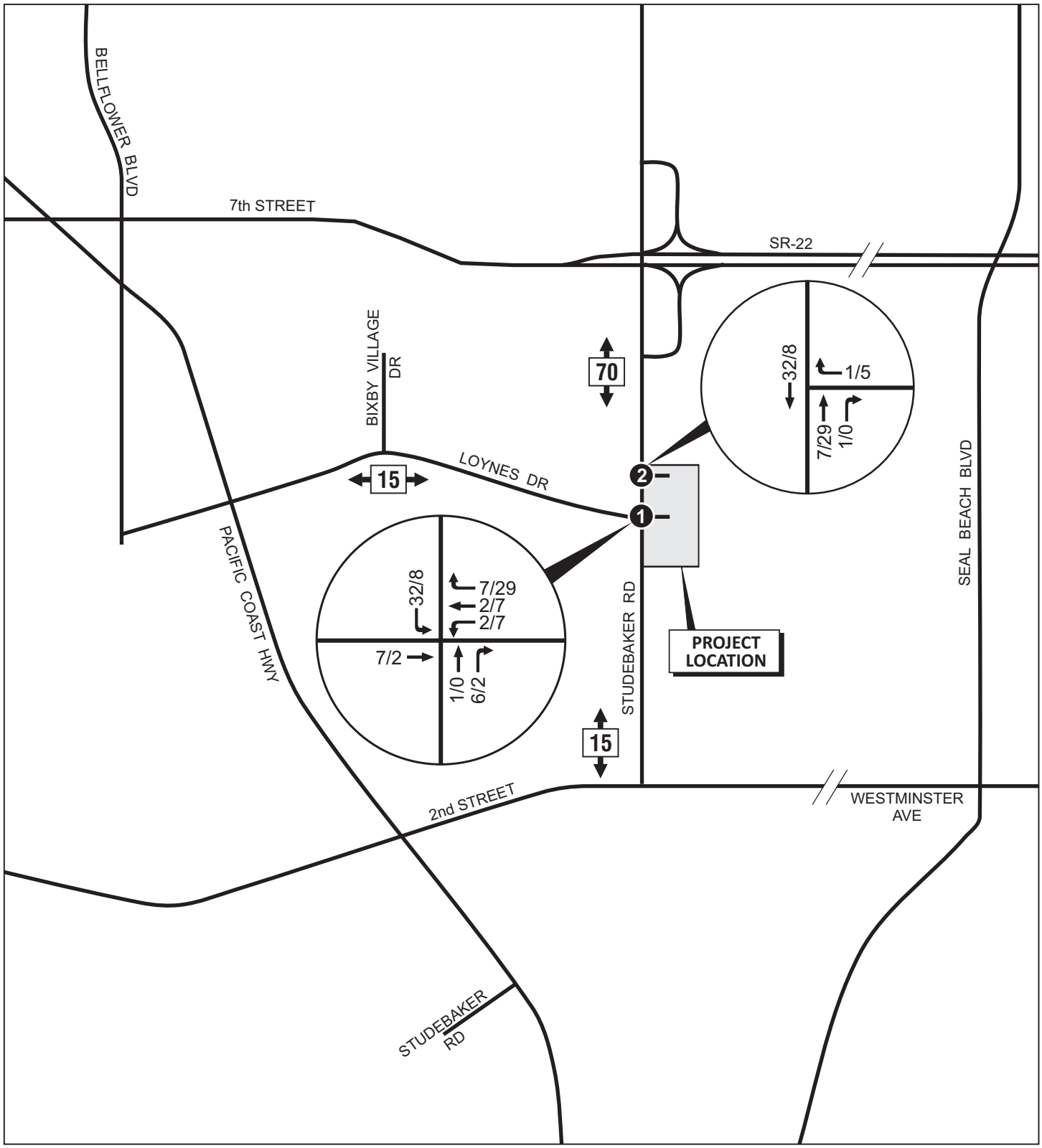
This information is for disclosure purposes only. Project impacts and mitigation measures if any at these locations are identified for the project build-out year condition.

PROJECT BUILD-OUT YEAR (2020) PLUS PROJECT CONDITIONS

To determine project build-out year plus project conditions, traffic generated by the proposed project, cumulative projects, and an ambient growth factor were added to existing traffic volumes at the study area intersections. Figure 10 shows the resulting project build-out year with project a.m. and p.m. peak-hour traffic volumes at the study area intersections.

Table F summarizes the results of the project build-out year with project a.m. and p.m. peak-hour LOS analysis for all signalized study area intersections using the ICU and HCM methodologies. As this table indicates, the study intersection is forecast to operate at an acceptable LOS during the peak hours. The proposed project would not significantly impact the intersection of Studebaker Road/ Loynes Drive during the weekday a.m. and p.m. peak hour under project build out plus project conditions.

The proposed project would include constructing the main access driveway at Studebaker Road/Loynes Drive. The project improvements would include the installation of one lane entering and exiting the main driveway. In addition, an additional southbound left turn pocket and left-turn lane would be constructed on Studebaker road. The existing inside eastbound right-turn lane on Loynes Drive would be converted to an eastbound through lane for vehicles entering the project site.



LSA

FIGURE 7

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

YY - Project Trip Distribution Percentages

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Project Trip Distribution and Assignment

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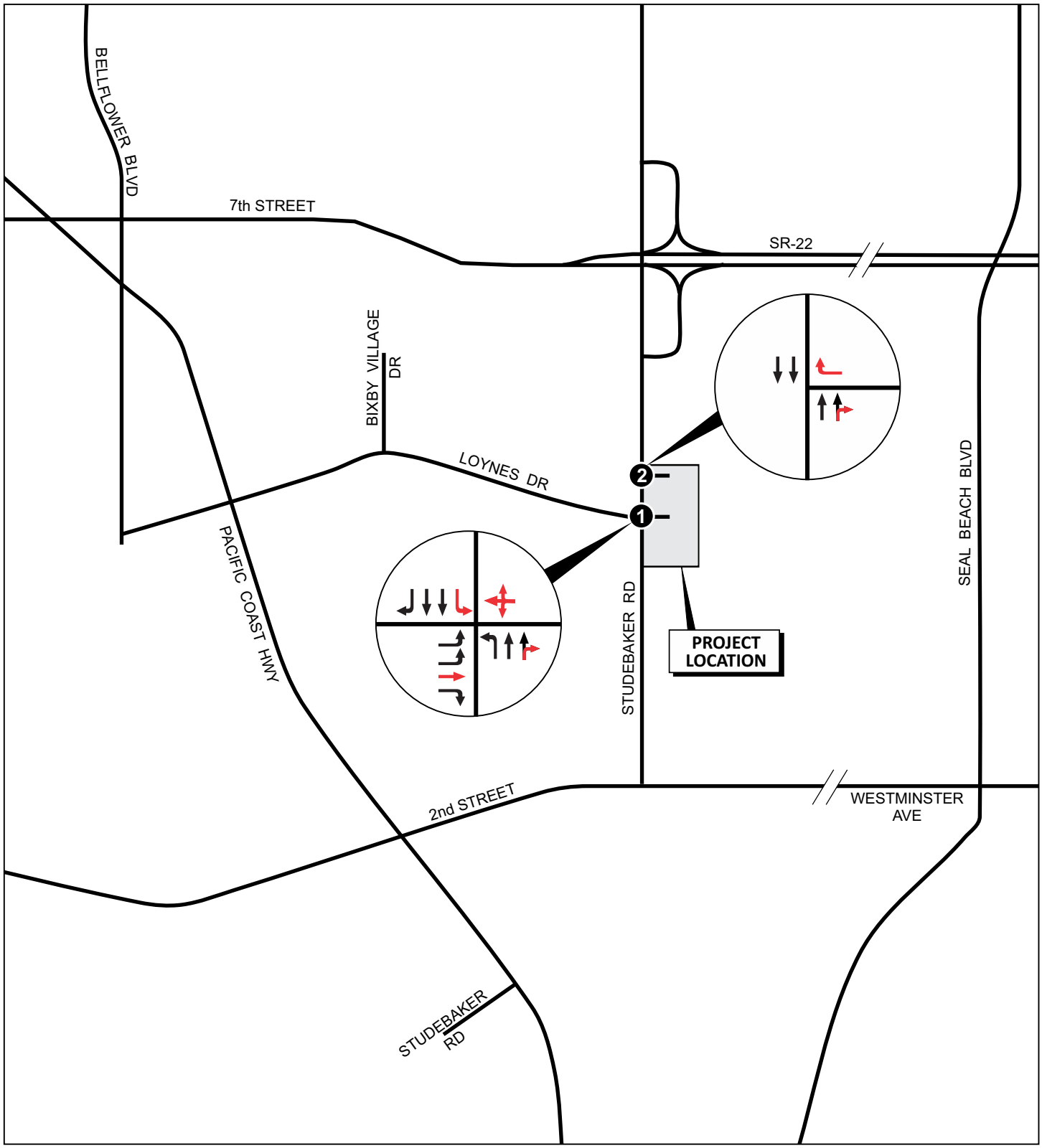

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FIGURE 8

LEGEND

1 - Study Area Intersections

- Directional Travel Lane

- Added in the Plus Project Condition

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SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Plus Project Intersection Geometry

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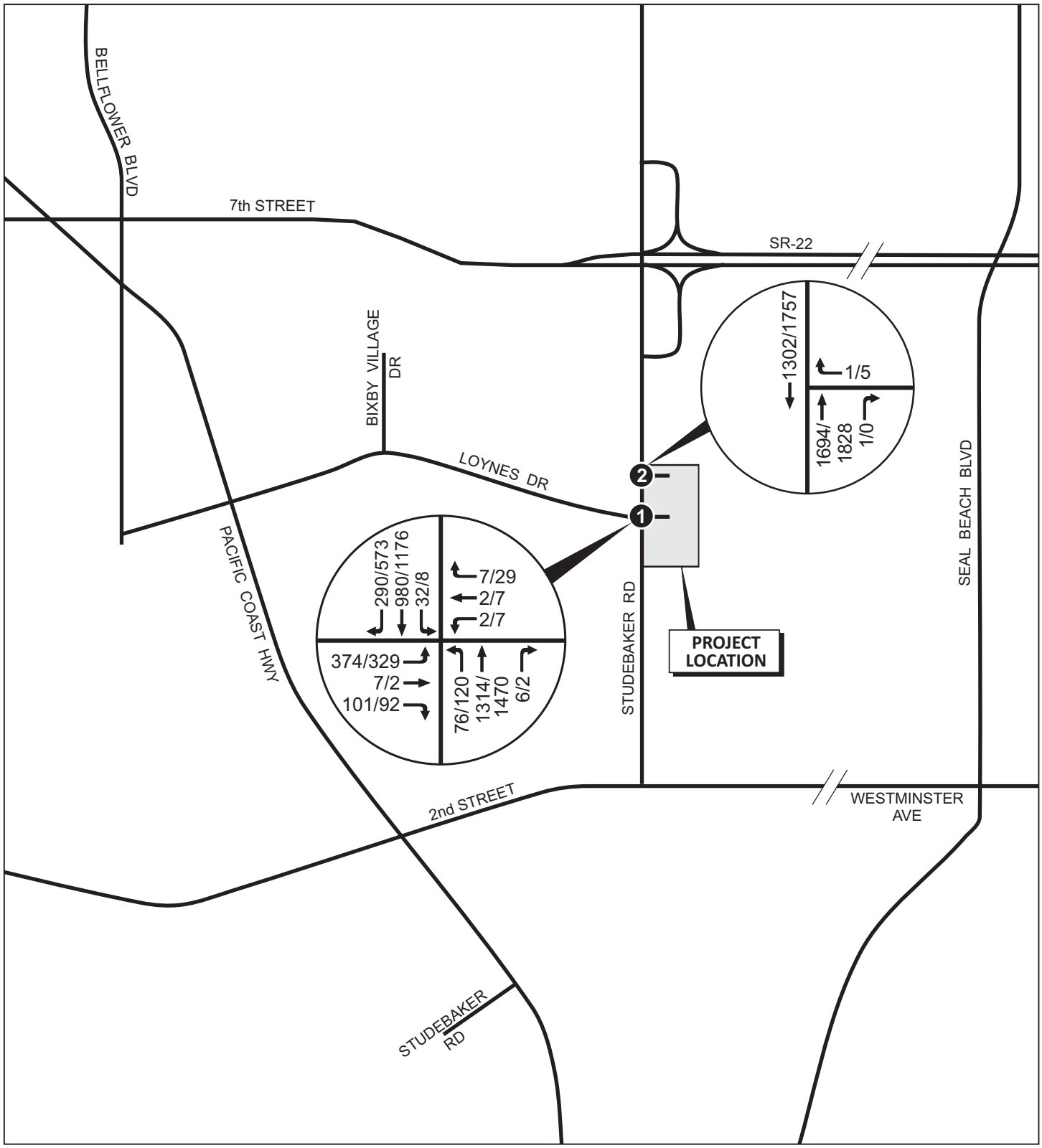

LSA

FIGURE 9

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Existing Plus Project Peak Hour Traffic Volumes

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Table E: Existing Plus Project Intersection Levels of Service Summary

Intersection	Existing Conditions				Existing Plus Project Conditions				Peak-Hour Δ		Significant Impact?
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		ICU or Delay		
	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	AM	PM	
Studebaker Road/Loynes Drive	0.68	B	0.72	C	0.71	C	0.76	C	0.03	0.04	No
HCM	*10.8*	*B*	*13.2*	*B*	*18.2*	*B*	*22.2*	*C*	*7.4*	*9.0*	*N/A*
Studebaker Road/Driveway 2											
HCM - Unsignalized	*–*	*–*	*–*	*–*	*18.2*	*C*	*20.1*	*C*	*–*	*–*	*N/A*

Notes: Delay is reported in seconds per vehicle.
Δ = change
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
LOS = level of service
N/A = not applicable

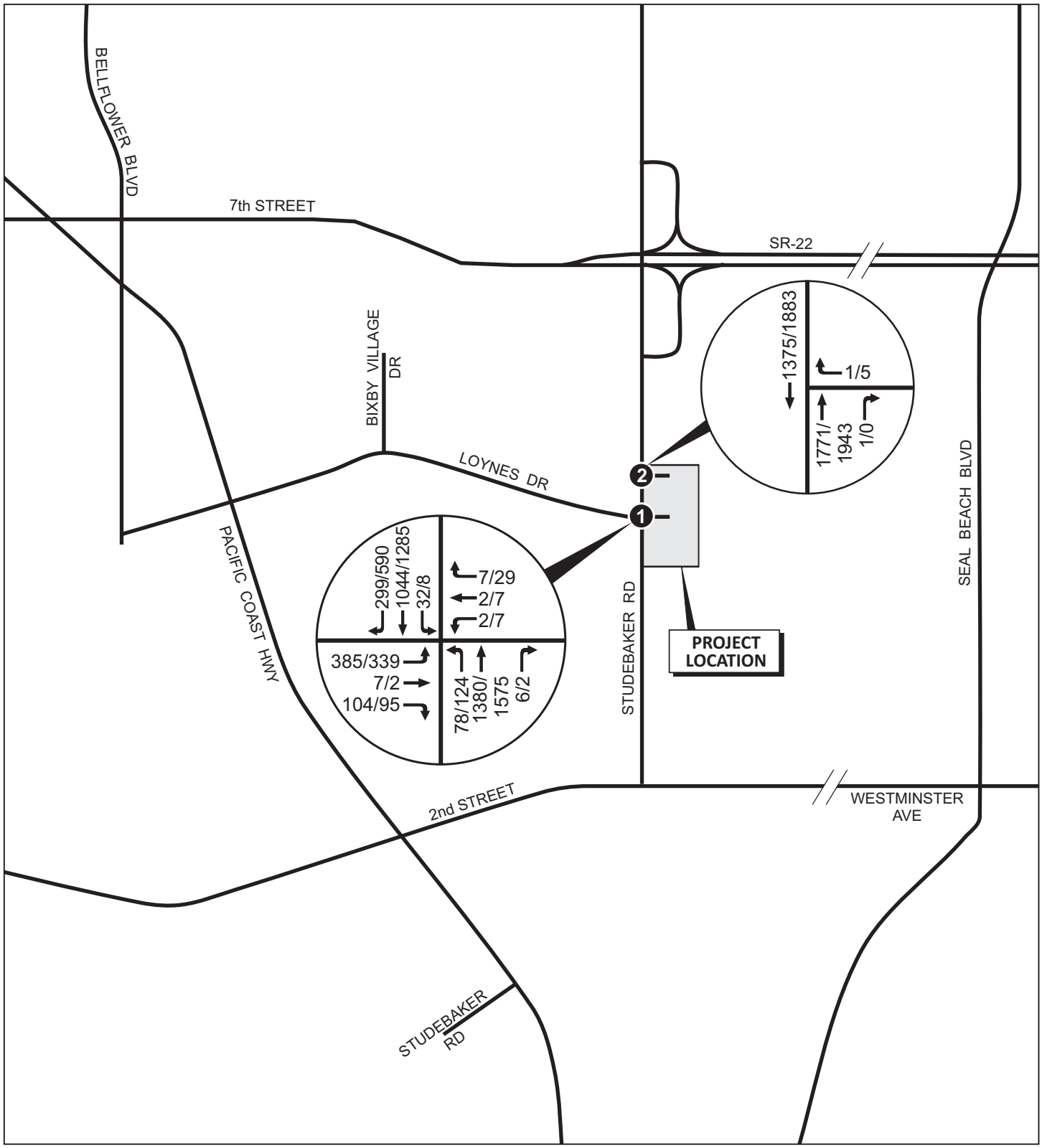

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FIGURE 10

LEGEND

1 - Study Area Intersections

XX/YY - AM/PM Peak Hour Volumes

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Project Build-Out Year Plus Cumulative Projects
Plus Project Peak Hour Traffic Volumes

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Table F: Project Build-Out (2020) Plus Project Intersection Levels of Service Summary

Intersection	Project Build-Out (2020) Conditions				Project Build-Out (2020) Plus Project Conditions				Peak-Hour Δ ICU or Delay		Significant Impact?
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour				
	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	AM	PM	
Studebaker Road/Loynes Drive	0.71	C	0.76	C	0.74	C	0.80	C	0.03	0.04	No
HCM	*11.3*	*B*	*13.8*	*B*	*19.0*	*B*	*24.4*	*C*	*7.7*	*10.6*	*N/A*
Studebaker Road/Driveway 2											
HCM - Unsignalized	*–*	*–*	*–*	*–*	*19.1*	*C*	*21.6*	*C*	*–*	*–*	*N/A*

Notes: Delay is reported in seconds per vehicle.
Δ = change
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
LOS = level of service
N/A = not applicable

PROJECT BUILD-OUT YEAR (2020) CONDITIONS WITH LOYNES DRIVE ROAD DIET

The City is proposing implementation of a road diet along Loynes Drive between Bellflower Boulevard and Studebaker Road in the near future, which would alter the roadway geometry at the intersection of Studebaker Road/Loynes Drive. This section will analyze an alternative project build-out year condition with the proposed road diet geometry along Loynes Drive in the no project and plus project conditions. The segment of Loynes Drive from Bellflower Boulevard to PCH is expected to be completed this year. However, there currently is no funding identified by the City for the segment of Loynes Drive from PCH to Studebaker Road.

Along the segment of Loynes Drive from Bellflower Boulevard to Studebaker Road, the proposed road diet will reduce the current four-lane roadway (two lanes in each direction) to a two-lane roadway (one lane in each direction). As a result, the lane configuration of Loynes Drive at the intersection of Loynes Drive/Studebaker Road will be altered from the current condition of two eastbound left-turn lanes and two eastbound right-turn lanes to the proposed condition of two eastbound left-turn lanes and one eastbound right-turn lane. For purposes of the alternative scenario, this is considered the no project condition.

With implementation of the project in this alternative condition, the geometry at the intersection of Loynes Drive/Studebaker Road, will become one eastbound left-turn lane, one eastbound shared left-turn lane/through lane, and one eastbound right-turn lane. Figure 11 illustrates the lane geometry with the Loynes Drive road diet alternative in both the no project and plus project conditions.

Table G summarizes the results of the project build-out year with Loynes Drive road diet alternative LOS. Appendix F provides the LOS calculation worksheets for the Loynes Drive road diet alternative. As this table indicates, the study area intersections are forecast to operate at an acceptable LOS during the peak hours. The proposed project would not significantly impact the intersection of Studebaker Road/Loynes Drive during the weekday a.m. and p.m. peak hours under project build out plus project conditions with the City's proposed Loynes Drive road diet.

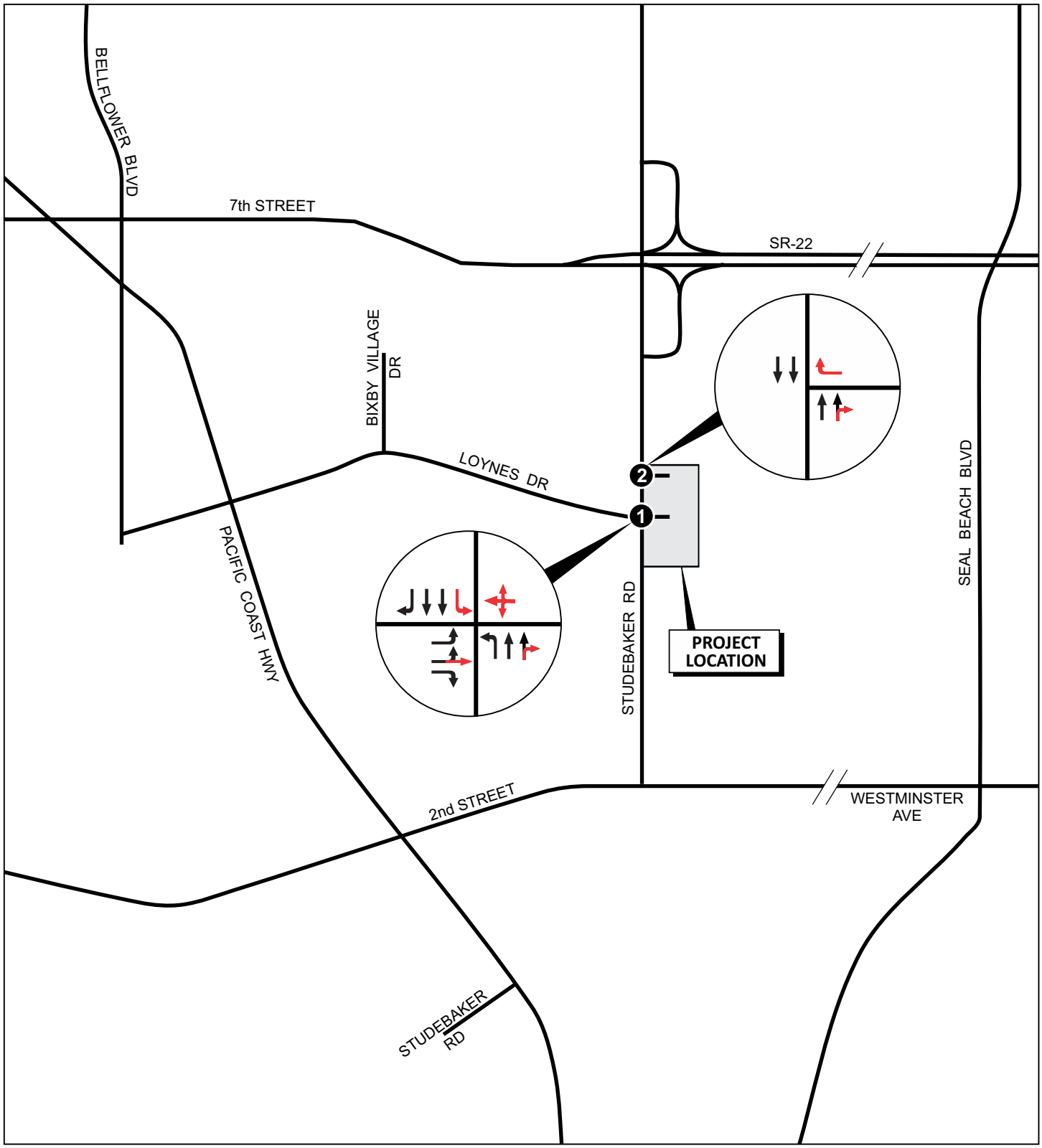
CONGESTION MANAGEMENT PROGRAM ANALYSIS

Based on the TIA guidelines from the 2010 CMP for Los Angeles County, the geographic area examined in this TIA must include the following:

1. All CMP arterial monitoring intersections, including monitored freeway on-/off-ramp intersections, where the proposed project would add 50 or more trips during either the a.m. or p.m. weekday peak hours.

2. Mainline freeway monitoring locations where the project would add 150 or more trips, in either direction, during the a.m. or p.m. weekday peak hours.

Upon review of the study area the project does not take direct access to a CMP facility (i.e., PCH). Therefore, a CMP-level analysis is not required, and no further highway or freeway analysis is required beyond the LOS analysis presented in this TIA for the project study area.



LSA

FIGURE 11

LEGEND

1 - Study Area Intersections

- Directional Travel Lane

- Added in the Plus Project Condition

N

SCHEMATIC - NOT TO SCALE

Long Beach Business Park

Project Build-Out Conditions with Loynes Drive Road Diet Lane Geometry

I:\ULL1801\G\Diet Lane Geometrics.cdr (10/17/2018)

Table G: Project Build-Out (2020) Conditions with Loynes Drive Road Diet Intersection Levels of Service Summary

Intersection	Project Build-Out (2020) Conditions				Project Build-Out (2020) Plus Project Conditions				Peak-Hour Δ		Significant Impact?
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		ICU or Delay		
	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	AM	PM	
Studebaker Road/Loynes Drive	0.71	C	0.76	C	0.73	C	0.79	C	0.02	0.03	No
HCM	*11.3*	*B*	*13.9*	*B*	*18.9*	*B*	*24.1*	*C*	*7.6*	*10.2*	*N/A*
Studebaker Road/Driveway 2											
HCM – Unsignalized	*–*	*–*	*–*	*–*	*19.1*	*C*	*21.6*	*C*	*–*	*–*	*N/A*

Notes: Delay is reported in seconds per vehicle.
Δ = change
HCM = *Highway Capacity Manual*
ICU = Intersection Capacity Utilization
LOS = level of service
N/A = not applicable

TRANSIT ANALYSIS

As required by the 2010 CMP for Los Angeles County, LSA reviewed existing transit services within the project area. One Orange County Transportation Authority (OCTA) bus route (Route 1) exists along Studebaker Road. Based on the 2009 CMP Transit Monitoring Network (Exhibit 3-2 in the CMP for Los Angeles County), there are no CMP transit routes within the project site.

To estimate transit trip generation for the project, the project trip generation (Table D) was adjusted by the values set forth in the CMP (i.e., person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of total person trips). Based on this methodology, the proposed project is forecast to generate approximately 26 daily transit trips, 3 a.m. peak-hour transit trips (2 inbound and 1 outbound), and 3 p.m. peak-hour transit trips (1 inbound and 2 outbound).

It is anticipated that the existing transit services within the project area would be able to accommodate the project-generated transit trips. OCTA provides coastal fixed-route bus service in the project vicinity. A bus stop for Route 1 is located adjacent to the project site on Studebaker Road. OCTA operates Route 1 from Long Beach to San Clemente. Long Beach Transit, however, does not provide service adjacent to the project site.

ACCESS ANALYSIS AND ON-SITE CIRCULATION

As indicated on the conceptual site plan (Figure 2), access to the project site is proposed at two locations (via full-access driveway on Studebaker Road/Loynes Drive) and a secondary right in and right out driveway (via Studebaker Road north of the project site). As a project design feature, a southbound left-turn pocket and left-turn lane on Studebaker Road would be constructed to allow access to the site. In addition, the inside eastbound right-turn lane on Loynes Drive would be converted to an eastbound through lane for vehicles entering the project site from Loynes Drive.

The signalized Studebaker Road/Loynes Drive driveway will have one outbound lane for drivers to exit (i.e., shared through/left/right-turn lane). The secondary Studebaker Road driveway will have a single outbound lane (i.e., right-turn only). The proposed signal at Studebaker Road and Loynes Drive –Project Driveway will have a left-turn pocket to allow southbound traffic to make safe left turns into the site.

An LOS analysis has been conducted for each driveway as previously discussed in this TIA. Based on the results of this analysis, all project driveways are forecast to operate at satisfactory LOS D or better for Existing Plus Project, Project Build-Out Year Plus Cumulative Projects, and Project Build-Out Year Plus Cumulative Projects Plus Project during both the a.m. and p.m. peak hours.

The project takes into account all modes of transportation. It does not conflict with any plans, ordinances, policies, or programs regarding public transit, bicycle, or pedestrian facilities. Mass transit would not be affected. The project would provide pedestrian/bicycle connectivity to/from the local circulation network while ensuring the safety of motorists, pedestrians, and bicyclists.

Truck Access

To determine the adequacy and ability for large trucks to circulate on site, truck turning templates for large trucks (wheelbase 50 feet) have been overlaid onto the project site plan by GAA Architects, as illustrated on Figures 12a and 12b. Based on the truck turning analysis, trucks would be able to make safe turns in/out of the signalized access of Studebaker Road/Loynes Drive and navigate through the internal drive aisle to the loading docks at the rear of the project site. Therefore, the proposed design and operation of the drive aisle and delivery locations would not affect access and circulation on site.

LSA used the HCM methodology to determine the vehicle queues in the new southbound left-turn lane under existing plus project and project build-out year plus cumulative project plus project conditions. The HCM queue calculation is a function of volume and stop control (i.e., traffic signal). Based on this analysis a storage length of 50 feet (two passenger cars) is required. To accommodate truck vehicles entering the project site, it is recommended that a minimum storage length of 100 feet (two 50 ft trucks) be provided. According to Section 405.2 of the California Department of Transportation (Caltrans) Highway Design Manual, 6th Edition (2018), in urban areas a 90 foot taper would typically be used, so the total length of the left-turn pocket would be 190 feet.

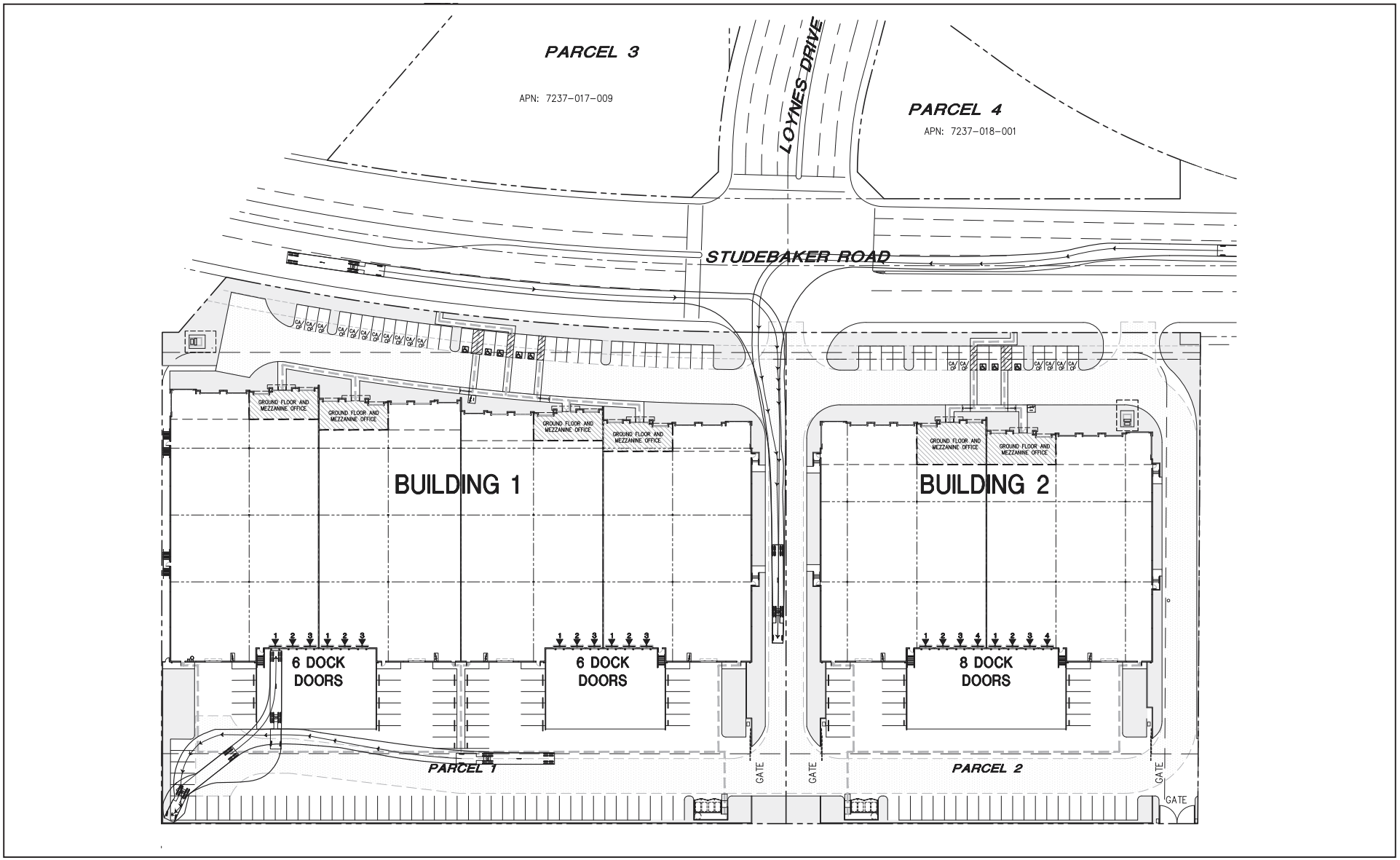
Sight Distance

A sight distance analysis was conducted along Studebaker Road and Loynes Drive at the proposed location of the main project driveway to ensure driver visibility and safety. In the project vicinity, the speed limit along Studebaker Road is 45 miles per hour (mph) and along Loynes Drive is 35 mph. According to Table 405.1A of the Caltrans Highway Design Manual, the corner sight distance for a roadway with the speed limit of 45 mph is 495 ft and for a speed limit of 35 mph is 385 ft.

There are no sight distance obstructions at the proposed project driveways. As shown in Figure 13, the sight distance at the main project driveway exceeds 495 ft in the south direction (left of the driveway), enabling a right turn on red without any visual obstruction. In the westward direction (straight out of the main driveway), the sight distance at the project driveway exceeds 385 ft. The sight distance at the right-in/right-out only driveway exceeds 495 ft in the south direction (left of the driveway), enabling a right turn at the stop without any visual obstruction. Therefore, the project driveways would meet the minimum sight distance requirements specified in the Caltrans Highway Design Manual.

Parking

To determine whether the site would provide adequate parking, LSA generated the parking requirement for the proposed business park project in accordance with Table 41-1C of City Municipal Code Section 21.41.216 (2018a). The parking rate for warehouse use under the code is 1 space per 1,000 sf. The proposed 139,500 sf Long Beach Business Park Project would require 140 spaces. The proposed project would provide a total parking supply of 167 spaces (i.e., 159 standard parking spaces plus 8 handicap-accessible spaces). Therefore, the project would provide parking consistent with City Zoning Code requirements. The project parking layout is illustrated on the site plan (Figure 2).



LSA

FIGURE 12a

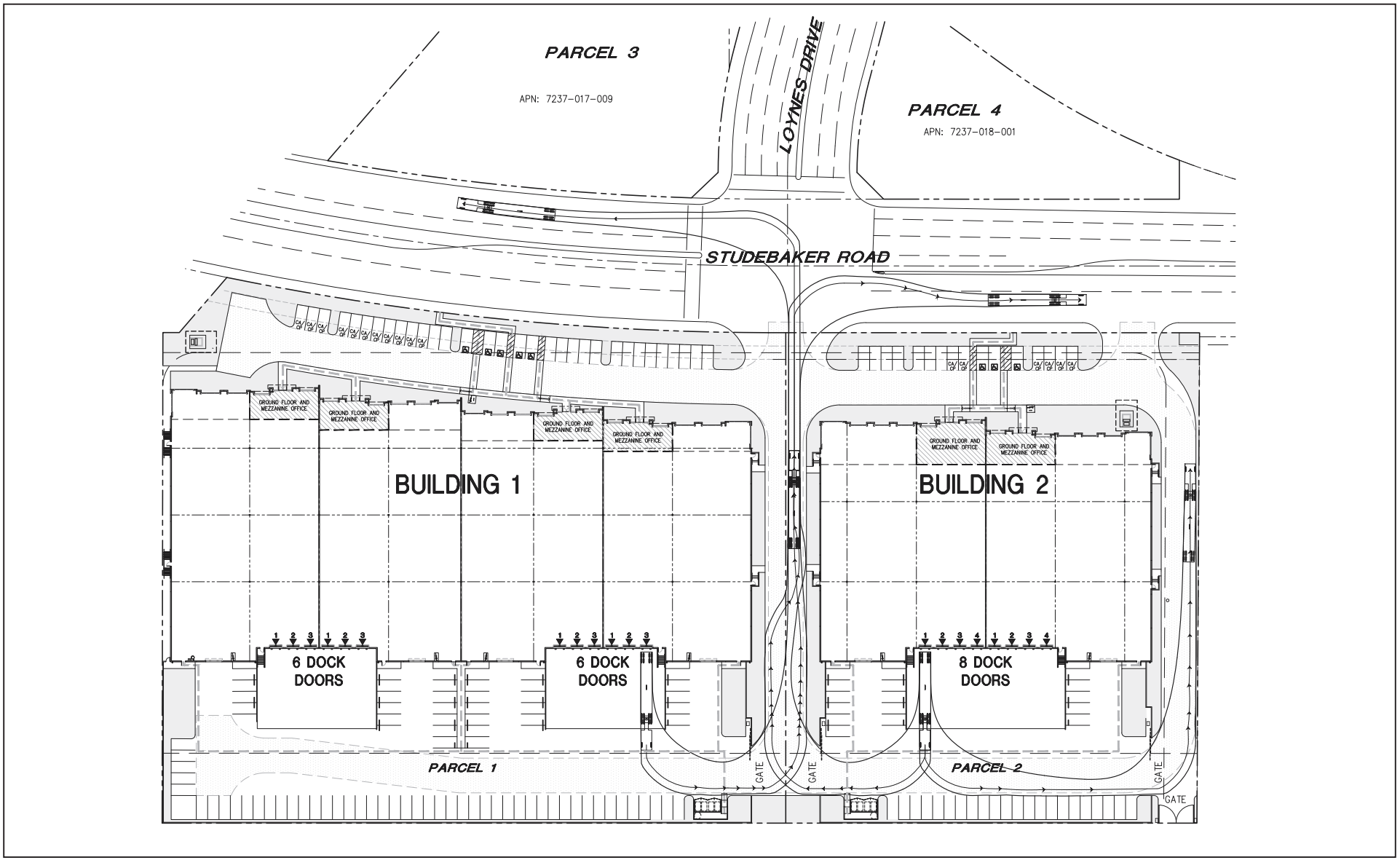
N

0 35 70
FEET

SOURCE: GAA Architects

Long Beach Business Park
Truck Access - Inbound

I:\ULL1801\G\Truck Access-Inbound.cdr (4/23/2019)



LSA

FIGURE 12b

N

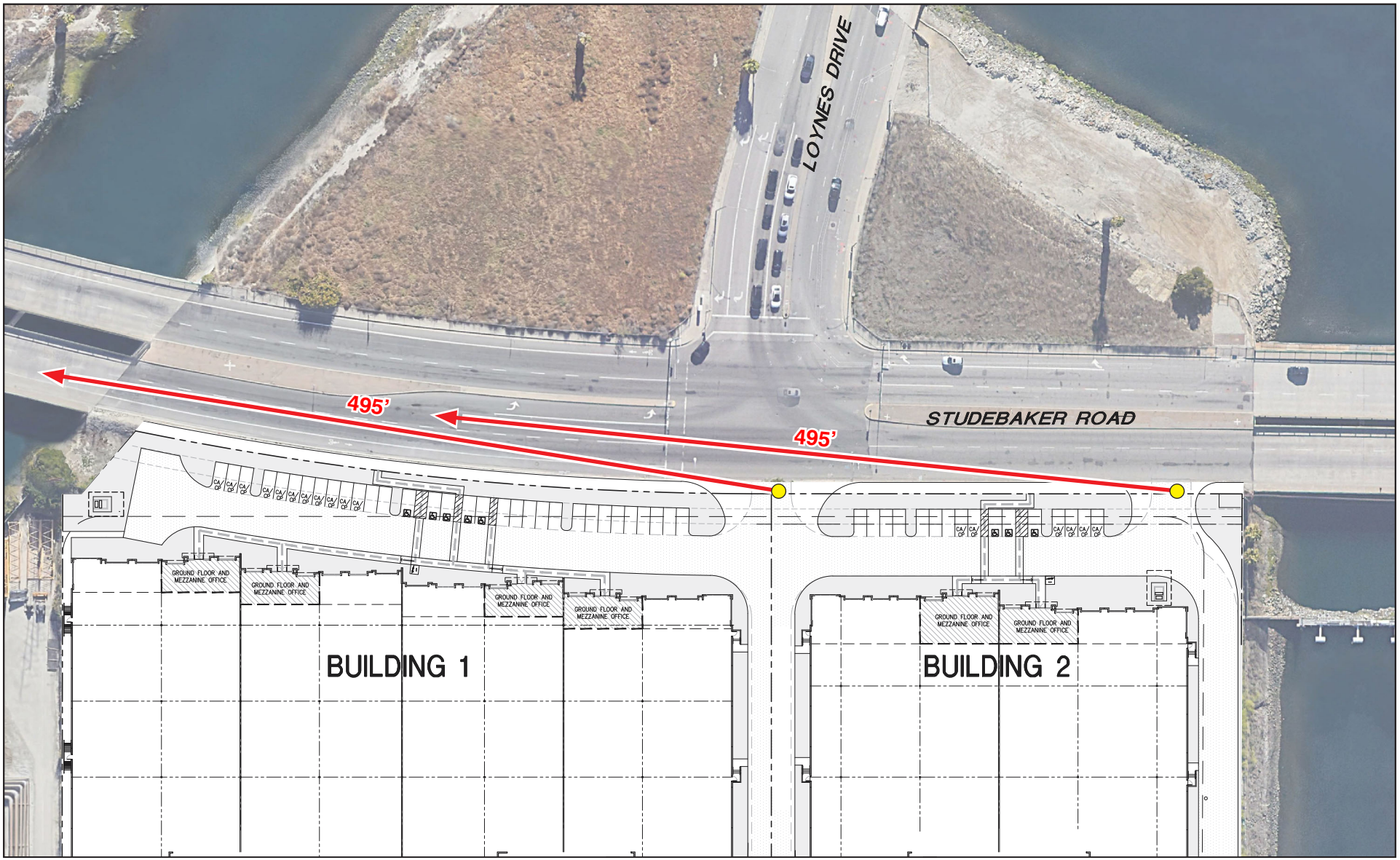
0 35 70
FEET

SOURCE: GAA Architects

Long Beach Business Park

Truck Access - Outbound

I:\ULL1801\G\Truck Access-Outbound.cdr (4/23/2019)



LSA

FIGURE 13

N

0 50 100
FEET

SOURCE: Google Earth

Long Beach Business Park
Sight Distance

I:\ULL1801\G\Sight Distance.cdr (7/10/2019)

CONSTRUCTION ANALYSIS

As shown in the table below, project construction will consist of six different phases and take up to 239 days to complete.

Phase	Duration (days)	No. of Workers	No. of Trucks/Day
Demolition	20	8	1
Site Preparation	22	9	0
Grading	43	8	3
Building Construction	154	70	1
Paving[1]	66	8	0
Architectural Coating[1]	44	44	0
Total	**239**	--	--

[1]Paving and Architectural Coating would overlap with Building Construction.

Based on the City's Municipal Code (Sections 8.80202A through 202C), permitted construction hours are from 7:00 a.m. to 7:00 p.m., Monday through Friday, and from 9:00 a.m. to 6:00 p.m. on Saturday. No construction hours are permitted on a Sunday. According to the project applicant, typical construction hours for this project would be 7:00 a.m. to 3:00 p.m. Workers are expected at arrive at the site before 7:00 a.m. (outside of the a.m. peak hour) and depart from the site before 4:00 p.m. (outside the p.m. peak hour). Because construction trips would occur outside of the a.m. and p.m. peak hours, no further analysis is required.

CONCLUSIONS

Based on the results of this analysis, implementation of the Long Beach Business Park Project would not result in any significant impacts to the surrounding roadway system. The evaluation of the study area intersection LOS shows that the addition of project traffic would not cause an intersection operation to deteriorate below the City's performance threshold.

Based on the site plan layout, adequate access and on-site circulation would be provided for all vehicle types.

Based on the proposed parking supply and City Zoning Code parking requirements, the Long Beach Business Park Project would provide adequate parking.

Because construction trips would occur outside of the peak-hour periods, the project would not result in any temporary circulation impacts.

REFERENCES

City of Fontana. 2003. *Truck Trip Generation Study*.

City of Long Beach Municipal Code. 2018a. Chapter 21.41.216 – Required Number of Parking Spaces. Table 41- 1C: Required Number of Parking Spaces for Commercial, Industrial/Manufacturing, and All Other Uses.

_____. 2018b. Title 21 – Zoning, Chapter 21.41 – Off-Street Parking and Loading Requirements

Institute of Transportation Engineers. 2017. *ITE Trip Generation Manual, 10th Edition*.

LLG. 2017. 2nd Street + PCH Development Traffic Impact Analysis.

Los Angeles County Metropolitan Transportation Authority. 2010. Congestion Management Program.

The California Department of Transportation (Caltrans). 2018. *Highway Design Manual*. Sixth Edition. Sacramento.

APPENDIX A

EXISTING TRAFFIC VOLUME DATA

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
City: Long Beach
Control: Signalized

Project ID: 18-05595-001
Date: 9/12/2018

Total

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	6	262	0	0	0	195	29	0	53	0	11	0	0	0	0	0	556
7:15 AM	14	363	0	0	0	205	43	0	54	0	14	0	0	0	0	0	693
7:30 AM	18	321	0	0	0	223	65	0	93	0	22	0	0	0	0	0	742
7:45 AM	23	297	0	0	0	282	100	0	84	0	35	0	0	0	0	0	821
8:00 AM	18	322	0	0	0	231	70	0	104	0	23	0	0	0	0	0	768
8:15 AM	13	341	0	0	0	210	52	0	82	0	21	0	0	0	0	0	719
8:30 AM	9	282	0	1	0	198	77	0	67	0	23	0	0	0	0	0	657
8:45 AM	7	272	0	0	0	211	70	0	67	0	16	0	0	0	0	0	643
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	108	2460	0	1	0	1755	506	0	604	0	165	0	0	0	0	0	5599
APPROACH %'s :	4.20%	95.76%	0.00%	0.04%	0.00%	77.62%	22.38%	0.00%	78.54%	0.00%	21.46%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	72	1281	0	0	0	946	287	0	363	0	101	0	0	0	0	0	3050
PEAK HR FACTOR :	0.783	0.939	0.000	0.000	0.000	0.839	0.718	0.000	0.873	0.000	0.721	0.000	0.000	0.000	0.000	0.000	0.929
	0.956				0.807				0.913								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	25	300	0	0	0	316	118	0	89	0	18	0	0	0	0	0	866
4:15 PM	26	388	0	0	0	293	116	0	99	0	25	0	0	0	0	0	947
4:30 PM	13	387	0	0	0	277	109	0	83	0	21	0	0	0	0	0	890
4:45 PM	29	335	0	1	0	277	127	0	88	0	19	1	0	0	0	0	877
5:00 PM	37	417	0	1	0	293	170	0	76	0	26	0	0	0	0	0	1020
5:15 PM	39	324	0	0	0	328	165	0	78	0	26	0	0	0	0	0	960
5:30 PM	33	319	0	0	0	277	125	0	102	0	23	0	0	0	0	0	879
5:45 PM	34	297	0	0	0	283	158	0	89	0	16	1	0	0	0	0	878
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	236	2767	0	2	0	2344	1088	0	704	0	174	2	0	0	0	0	7317
APPROACH %'s :	7.85%	92.08%	0.00%	0.07%	0.00%	68.30%	31.70%	0.00%	80.00%	0.00%	19.77%	0.23%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	118	1463	0	2	0	1175	571	0	325	0	92	1	0	0	0	0	3747
PEAK HR FACTOR :	0.756	0.877	0.000	0.500	0.000	0.896	0.840	0.000	0.923	0.000	0.885	0.250	0.000	0.000	0.000	0.000	0.918
	0.870				0.885				0.968								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
City: Long Beach
Control: Signalized

Project ID: 18-05595-001
Date: 9/12/2018

Cars

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	6	257	0	0	0	190	29	0	53	0	11	0	0	0	0	0	546
7:15 AM	14	360	0	0	0	200	43	0	54	0	14	0	0	0	0	0	685
7:30 AM	17	317	0	0	0	217	62	0	92	0	22	0	0	0	0	0	727
7:45 AM	22	292	0	0	0	279	99	0	82	0	35	0	0	0	0	0	809
8:00 AM	17	314	0	0	0	223	70	0	102	0	23	0	0	0	0	0	749
8:15 AM	12	330	0	0	0	204	51	0	81	0	21	0	0	0	0	0	699
8:30 AM	9	275	0	1	0	191	76	0	64	0	23	0	0	0	0	0	639
8:45 AM	7	270	0	0	0	205	70	0	65	0	16	0	0	0	0	0	633
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	104	2415	0	1	0	1709	500	0	593	0	165	0	0	0	0	0	5487
APPROACH %'s :	4.13%	95.83%	0.00%	0.04%	0.00%	77.37%	22.63%	0.00%	78.23%	0.00%	21.77%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	68	1253	0	0	0	923	282	0	357	0	101	0	0	0	0	0	2984
PEAK HR FACTOR :	0.77	0.949	0.000	0.000	0.000	0.827	0.712	0.000	0.875	0.000	0.721	0.000	0.000	0.000	0.000	0.000	0.922
	0.966				0.797				0.916								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	25	295	0	0	0	314	117	0	86	0	18	0	0	0	0	0	855
4:15 PM	26	385	0	0	0	292	116	0	98	0	25	0	0	0	0	0	942
4:30 PM	13	383	0	0	0	276	108	0	82	0	21	0	0	0	0	0	883
4:45 PM	29	334	0	1	0	277	126	0	88	0	19	1	0	0	0	0	875
5:00 PM	37	415	0	1	0	292	170	0	75	0	26	0	0	0	0	0	1016
5:15 PM	39	321	0	0	0	328	164	0	78	0	26	0	0	0	0	0	956
5:30 PM	33	317	0	0	0	277	125	0	101	0	23	0	0	0	0	0	876
5:45 PM	34	296	0	0	0	281	158	0	89	0	16	1	0	0	0	0	875
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	236	2746	0	2	0	2337	1084	0	697	0	174	2	0	0	0	0	7278
APPROACH %'s :	7.91%	92.02%	0.00%	0.07%	0.00%	68.31%	31.69%	0.00%	79.84%	0.00%	19.93%	0.23%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	118	1453	0	2	0	1173	568	0	323	0	92	1	0	0	0	0	3730
PEAK HR FACTOR :	0.76	0.875	0.000	0.500	0.000	0.894	0.835	0.000	0.918	0.000	0.885	0.250	0.000	0.000	0.000	0.000	0.918
	0.868				0.885				0.963								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
City: Long Beach
Control: Signalized

Project ID: 18-05595-001
Date: 9/12/2018

2axle

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	7
7:15 AM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	6
7:30 AM	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	4
7:45 AM	1	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	6
8:00 AM	1	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8
8:15 AM	1	7	0	0	0	1	1	0	0	0	0	0	0	0	0	0	10
8:30 AM	0	1	0	0	0	3	1	0	1	0	0	0	0	0	0	0	6
8:45 AM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	19	0	0	0	21	6	0	2	0	0	0	0	0	0	0	51
APPROACH %'s :	13.64%	86.36%	0.00%	0.00%	0.00%	77.78%	22.22%	0.00%	100.00%	0.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	3	13	0	0	0	6	5	0	1	0	0	0	0	0	0	0	28
PEAK HR FACTOR :	0.750	0.464	0.000	0.000	0.000	0.375	0.417	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.700
	0.500				0.688				0.250								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	4	0	0	0	2	1	0	3	0	0	0	0	0	0	0	10
4:15 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	5
4:45 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	16	0	0	0	7	4	0	5	0	0	0	0	0	0	0	32
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	63.64%	36.36%	0.00%	100.00%	0.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	8	0	0	0	2	3	0	1	0	0	0	0	0	0	0	14
PEAK HR FACTOR :	0.00	0.667	0.000	0.000	0.000	0.500	0.750	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.700
	0.667				0.625				0.250								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
City: Long Beach
Control: Signalized

Project ID: 18-05595-001
Date: 9/12/2018

3axle

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5
8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	10	0	0	0	5	0	0	0	0	0	0	0	0	0	0	15
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%									
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8
PEAK HR FACTOR :	0.000	0.417	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
		0.417				0.750											

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%													
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
		0.250															

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
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Control: Signalized

Project ID: 18-05595-001
Date: 9/12/2018

4axle

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	1	3	0	0	0	5	0	0	1	0	0	0	0	0	0	0	10
7:45 AM	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4
8:00 AM	0	4	0	0	0	4	0	0	2	0	0	0	0	0	0	0	10
8:15 AM	0	1	0	0	0	4	0	0	1	0	0	0	0	0	0	0	6
8:30 AM	0	2	0	0	0	3	0	0	2	0	0	0	0	0	0	0	7
8:45 AM	0	1	0	0	0	2	0	0	2	0	0	0	0	0	0	0	5
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	16	0	0	0	20	0	0	9	0	0	0	0	0	0	0	46
APPROACH %'s :	5.88%	94.12%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	1	10	0	0	0	14	0	0	5	0	0	0	0	0	0	0	30
PEAK HR FACTOR :	0.250	0.625	0.000	0.000	0.000	0.700	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
	0.688				0.700				0.625								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%					100.00%	0.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
	0.250								0.250								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
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Control: Signalized

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Bikes

NS/EW Streets:	Studebaker Rd				Studebaker Rd				Loynes Dr				Loynes Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%					100.00%	0.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	1	0	2	0	2	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5:45 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	2	0	0	0	7	0	0	0	0	1	0	0	0	0	0	11
APPROACH %'s :	33.33%	66.67%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
						0.500											

National Data & Surveying Services

Intersection Turning Movement Count

Location: Studebaker Rd & Loynes Dr
City: Long Beach

Project ID: 18-05595-001
Date: 9/12/2018

Pedestrians (Crosswalks)

NS/EW Streets:	Studebaker Rd		Studebaker Rd		Loynes Dr		Loynes Dr		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	1
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	1	0	1
APPROACH %'s :							100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	0	1
PEAK HR FACTOR :							0.250		0.250
							0.250		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

Studebaker Rd & Loynes Dr

Peak Hour Turning Movement Count

ID: 18-05595-001
City: Long Beach

Day: Wednesday
Date: 09/12/2018

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Studebaker Rd — SOUTHBOUND

AM	287	946	0	0	1644
NOON	0	0	0	0	0
PM	571	1175	0	0	1788
	1	2	0	0	

Loynes Dr — EASTBOUND

AM	NOON	PM	
359	0	690	
0	0	1	0
363	0	325	2
0	0	0	0
101	0	92	2

Loynes Dr — WESTBOUND

	PM	NOON	AM
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
	0	0	0

CONTROL

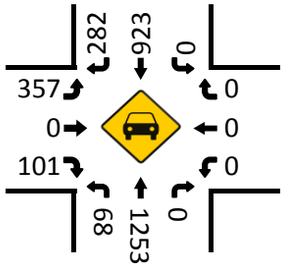
Signalized

TEV	3050	0	3747
	AM	NOON	PM
PHF	0.93		0.92

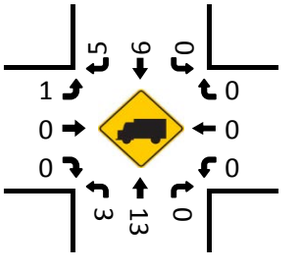
Studebaker Rd — NORTHBOUND

PM	1269	2	118	1463	0
NOON	0	0	0	0	0
AM	1047	0	72	1281	0
		0	1	2	0

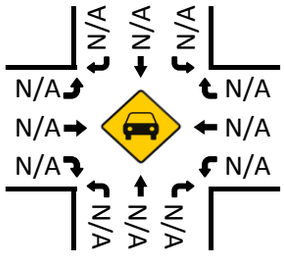
Cars (AM)



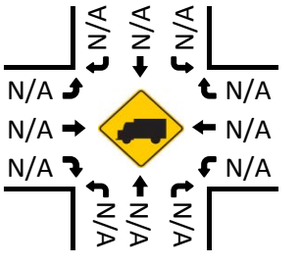
2axle (AM)



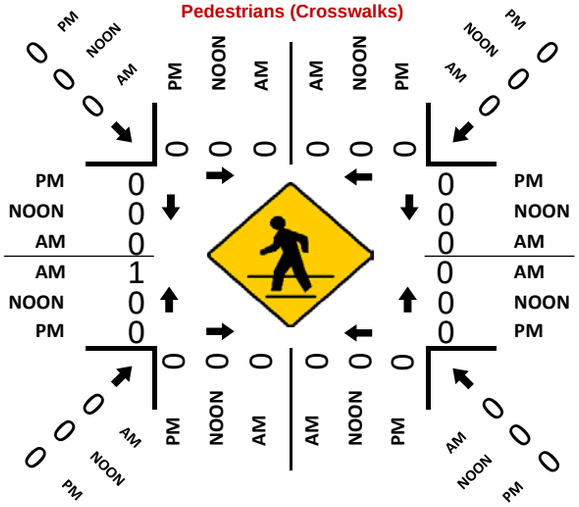
Cars (NOON)



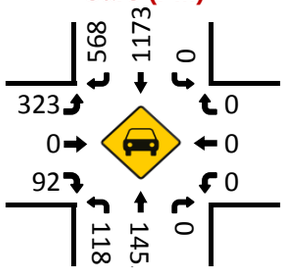
2axle (NOON)



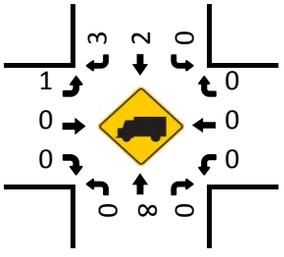
Pedestrians (Crosswalks)



Cars (PM)



2axle (PM)



APPENDIX B

EXISTING LEVEL OF SERVICE WORKSHEETS

Long Beach Business Park
ULL1801
Existing AM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.681
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0	0	0	0 2	0	1	2	0	0	0 2	0	0	0	0 0
Volume Module: >> Count Date: 12 Sep 2018 <<																
Base Vol:	76	1313	0	0	980	290	374	0	101	0	0	0				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	76	1313	0	0	980	290	374	0	101	0	0	0				
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0				
Initial Fut:	76	1313	0	0	980	290	374	0	101	0	0	0				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93				
PHF Volume:	82	1412	0	0	1054	312	402	0	109	0	0	0				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	82	1412	0	0	1054	312	402	0	109	0	0	0				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	82	1412	0	0	1054	312	402	0	109	0	0	0				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00				
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0				
Capacity Analysis Module:																
Vol/Sat:	0.05	0.44	0.00	0.00	0.33	0.19	0.14	0.00	0.03	0.00	0.00	0.00				
Crit Moves:		****		****			****									

Long Beach Business Park
ULL1801
Existing PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.723
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	53	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2 0	0	0 0	2 0	1	2 0	0 0	2	0 0	0 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	120	1470	0	0	1176	573	329	0	92	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	120	1470	0	0	1176	573	329	0	92	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	120	1470	0	0	1176	573	329	0	92	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	130	1598	0	0	1278	623	358	0	100	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	130	1598	0	0	1278	623	358	0	100	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	130	1598	0	0	1278	623	358	0	100	0	0	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.50	0.00	0.00	0.40	0.39	0.12	0.00	0.03	0.00	0.00	0.00
Crit Moves:		****		****			****					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	374	101	76	1313	980	290
Future Volume (veh/h)	374	101	76	1313	980	290
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	402	109	82	1412	1054	312
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	609	491	120	2300	1747	779
Arrive On Green	0.18	0.18	0.07	0.65	0.49	0.49
Sat Flow, veh/h	3456	2790	1781	3647	3647	1585
Grp Volume(v), veh/h	402	109	82	1412	1054	312
Grp Sat Flow(s),veh/h/ln	1728	1395	1781	1777	1777	1585
Q Serve(g_s), s	5.5	1.7	2.3	11.9	10.9	6.4
Cycle Q Clear(g_c), s	5.5	1.7	2.3	11.9	10.9	6.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	609	491	120	2300	1747	779
V/C Ratio(X)	0.66	0.22	0.68	0.61	0.60	0.40
Avail Cap(c_a), veh/h	1220	985	192	2300	1747	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	18.0	23.2	5.3	9.4	8.2
Incr Delay (d2), s/veh	1.2	0.2	6.7	1.2	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.4	1.1	2.9	3.6	2.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	18.2	29.9	6.5	10.9	9.7
LnGrp LOS	C	B	C	A	B	A
Approach Vol, veh/h	511			1494	1366	
Approach Delay, s/veh	20.3			7.8	10.6	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		13.5	7.9	29.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	5.5	23.0
Max Q Clear Time (g_c+I1), s		13.9		7.5	4.3	12.9
Green Ext Time (p_c), s		10.6		1.5	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	329	92	120	1470	1176	573
Future Volume (veh/h)	329	92	120	1470	1176	573
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	358	100	130	1598	1278	623
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	541	436	166	2424	1806	805
Arrive On Green	0.16	0.16	0.09	0.68	0.51	0.51
Sat Flow, veh/h	3456	2790	1781	3647	3647	1585
Grp Volume(v), veh/h	358	100	130	1598	1278	623
Grp Sat Flow(s),veh/h/ln	1728	1395	1781	1777	1777	1585
Q Serve(g_s), s	5.4	1.7	4.0	14.5	15.4	17.7
Cycle Q Clear(g_c), s	5.4	1.7	4.0	14.5	15.4	17.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	541	436	166	2424	1806	805
V/C Ratio(X)	0.66	0.23	0.78	0.66	0.71	0.77
Avail Cap(c_a), veh/h	1116	901	208	2424	1806	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	20.6	24.7	5.1	10.5	11.1
Incr Delay (d2), s/veh	1.4	0.3	14.1	1.4	2.4	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	2.2	3.5	5.3	6.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.5	20.8	38.8	6.5	12.9	18.2
LnGrp LOS	C	C	D	A	B	B
Approach Vol, veh/h	458			1728	1901	
Approach Delay, s/veh	22.9			9.0	14.6	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		42.5		13.2	9.7	32.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		38.0		18.0	6.5	27.0
Max Q Clear Time (g_c+I1), s		16.5		7.4	6.0	19.7
Green Ext Time (p_c), s		13.1		1.3	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

APPENDIX C

CMP FOR LOS ANGELES COUNTY (2010) GROWTH FACTORS

Exhibit 2-4

2009 CMP HIGHWAY AND ROADWAY SYSTEM

State Route	FREEWAY/Arterial Name
1	Pacific Coast Hwy, Lincoln Bl, Sepulveda Bl
2	Santa Monica Bl, Alvarado St. Glendale Bl. GLENDALE FWY, Angeles Crest Hwy (excluding sections of Santa Monica Bl. Between I-10 to Bundy Dr and I-405 and La Brea Ave.)
5	SANTA ANA FWY, GOLDEN STATE FWY
10	SANTA MONICA FWY, SAN BERNARDINO FWY
14	ANTELOPE VALLEY FWY
18	Pearblossom Hwy
19/164	Lakewood Bl., Rosemead Bl. (excluding section of Lakewood Bl/Rosemead Bl. Between Route 1 and Del Amo Bl, Gardendale and Grand Ave, and Grand Ave. to Foothill Bl.)
22	7th St., GARDEN GROVE FWY
23	Decker Canyon Rd
27	Topanga Canyon Rd.
39	Azusa Av, San Gabriel Canyon Rd
47	Vincent Thomas Bridge, Henry Ford Av, Alameda St.
57	ORANGE FWY
60	POMONA FWY
66	Foothill Bl
71	Corona Expy
72	Whittier Bl (excluding a sectionn of Whittier Bl between Esperanza and Via Clement)
90	Marina Expy, MARINA FWY
91	Artesia Bl, GARDENA FWY, ARTESIA FWY (excluding a section of Artesia Bl. Between PCH and Vermond Ave.)
101	SANTA ANA FWY (SPUR), HOLLYWOOD FWY, VENTURA FWY
103	TERMINAL ISLAND FWY (excluding a sectionn of the Terminal Island Fwy between PCH and Willow St.)
105	GLENN ANDERSON FWY
107	Hawthorn Bl
110	Gaffey st, HARBOR FWY, PASADENA FWY, Arroyo Pkwy (excluding a section of Arroyo Pkwy between Glenarm St. and Colorado Bl.)
118	SIMI VALLEY FWY, SAN FERNANDO VALLEY FWY
126	Henry Mayo Dr, Magic Mountain Pkwy, San Fernando Rd (excluding a section of Magic Mountain Pkwy/San Fernando Rd between I-5 to SR-14.
134	VENTURA FWY
138	Lancaster Rd, Avenue "D", ANTELOPE VALLEY FWY, Palmdale Bl, 47th St. East, Fort Tejon Rd. Pearblossom Hwy, Antelope Hwy
170	Highland Ave, HOLLYWOOD FWY
187	Venice Bl
210	FOOTHILL FWY

State Route	FREEWAY/Arterial Name
213	Western Av
405	SAN DIEGO FWY
605	SAN GABRIEL RIVER FWY
710	LONG BEACH FWY, Pasadena Av, St. John Av

Principal Arterial	Limits
Alameda St	Port of Los Angeles to Route 101
Alamitos Av	Ocean Bl to Pacific Coast Hwy
Arrow Hwy	I-210 to San Bernardino County
Arroyo Pkwy	Glenarm st. to Colorado Bl
Artesia Bl	Pacific Coast Hwy to Vermont Ave.
Azusa Av/San Gabriel Ave	Colima Rd to just south of the Los Angeles National Forest Boundary
Colima Rd	Hacienda Bl to Azusa Av
Fremont Av	Valley Bl to Columbia St
Grand Av	SR-57 to San Bernardino County
Hacienda Bl	Orange County to Colima Rd
Imperial Hwy	I- 5 to Orange County
La Cienega Bl	I-405 to I-10
Lakewood Bl./Rosemead Bl.	Route 1 to Del Amo Bl, Gardendale to Gallatin Rd., and Grand Ave. to Foothill Bl.
Santa Monica Bl	I-10 to Bundy Dr. and I-405 to La Brea Ave.
Magic Mountain Pkwy/San Fernando Rd	I-5 to Route 14
Manchester/Firestone Bl	I-710 to Lincoln Bl
Seventh St	Alamitos Av to Pacific Coast Hwy
Sierra Hwy	SR-126 to SR-14 (at Red Rover Mine Rd)
Shoreline Dr	I- 710 to Ocean Bl
Terminal Island Frwy	Pacific Coast Hwy and Willow
Valley Bl	I- 710 to Fremont Av
Ventura Bl	Topanga Canyon Bl to Lankershiem Bl
Victory Bl	Topanga Canyon Bl to SR-170
Whittier Bl	Esperanza to Via Clement
Wilshire Bl.	Ocean Bl to I-110

APPENDIX D

PROJECT BUILD-OUT LOS CALCULATION WORKSHEETS

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project AM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.707
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	51	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2 0	0	0 0	2 0	1	2 0	0 0	2	0 0	0 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	78	1379	0	0	1044	299	385	0	104	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	1379	0	0	1044	299	385	0	104	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	1379	0	0	1044	299	385	0	104	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	84	1483	0	0	1123	322	414	0	112	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	1483	0	0	1123	322	414	0	112	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	1483	0	0	1123	322	414	0	112	0	0	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.46	0.00	0.00	0.35	0.20	0.14	0.00	0.03	0.00	0.00	0.00
Crit Moves:		****		****			****					

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.763
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0	0	0	0 2	0	1	2	0	0	0 2	0	0	0	0 0
Volume Module: >> Count Date: 12 Sep 2018 <<																
Base Vol:	124	1575	0	0	1285	590	339	0	95	0	0	0				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	124	1575	0	0	1285	590	339	0	95	0	0	0				
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0				
Initial Fut:	124	1575	0	0	1285	590	339	0	95	0	0	0				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
PHF Volume:	135	1712	0	0	1397	641	368	0	103	0	0	0				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	135	1712	0	0	1397	641	368	0	103	0	0	0				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	135	1712	0	0	1397	641	368	0	103	0	0	0				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00				
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0				
Capacity Analysis Module:																
Vol/Sat:	0.08	0.53	0.00	0.00	0.44	0.40	0.13	0.00	0.03	0.00	0.00	0.00				
Crit Moves:		****		****			****									

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project + Project AM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.738
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	55	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	2 0	1	2 0	1 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	78	1380	6	32	1044	299	385	7	104	2	2	7
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	1380	6	32	1044	299	385	7	104	2	2	7
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	1380	6	32	1044	299	385	7	104	2	2	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	84	1484	6	34	1123	322	414	8	112	2	2	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	1484	6	34	1123	322	414	8	112	2	2	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	1484	6	34	1123	322	414	8	112	2	2	8
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	2.00	1.00	1.00	0.18	0.18	0.64
Final Sat.:	1600	3186	14	1600	3200	1600	2880	1600	1600	291	291	1018
Capacity Analysis Module:												
Vol/Sat:	0.05	0.47	0.47	0.02	0.35	0.20	0.14	0.00	0.07	0.01	0.01	0.01
Crit Moves:		****		****			****					****

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project + Project PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.798
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	66	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	2 0	1	2 0	1 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	124	1575	2	8	1285	590	339	2	95	7	7	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	124	1575	2	8	1285	590	339	2	95	7	7	29
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	124	1575	2	8	1285	590	339	2	95	7	7	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	135	1712	2	9	1397	641	368	2	103	8	8	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	135	1712	2	9	1397	641	368	2	103	8	8	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	135	1712	2	9	1397	641	368	2	103	8	8	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	2.00	1.00	1.00	0.16	0.16	0.68
Final Sat.:	1600	3196	4	1600	3200	1600	2880	1600	1600	260	260	1079
Capacity Analysis Module:												
Vol/Sat:	0.08	0.54	0.54	0.01	0.44	0.40	0.13	0.00	0.06	0.03	0.03	0.03
Crit Moves:		****		****			****				****	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	385	104	78	1379	1044	299
Future Volume (veh/h)	385	104	78	1379	1044	299
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	414	112	84	1483	1123	322
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	621	502	121	2290	1736	774
Arrive On Green	0.18	0.18	0.07	0.64	0.49	0.49
Sat Flow, veh/h	3456	2790	1781	3647	3647	1585
Grp Volume(v), veh/h	414	112	84	1483	1123	322
Grp Sat Flow(s),veh/h/ln	1728	1395	1781	1777	1777	1585
Q Serve(g_s), s	5.7	1.8	2.4	13.0	12.1	6.7
Cycle Q Clear(g_c), s	5.7	1.8	2.4	13.0	12.1	6.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	621	502	121	2290	1736	774
V/C Ratio(X)	0.67	0.22	0.69	0.65	0.65	0.42
Avail Cap(c_a), veh/h	1215	981	177	2290	1736	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	17.9	23.3	5.6	9.8	8.4
Incr Delay (d2), s/veh	1.2	0.2	6.9	1.4	1.9	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	1.1	3.2	4.1	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	18.2	30.2	7.0	11.7	10.1
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	526			1567	1445	
Approach Delay, s/veh	20.2			8.2	11.3	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		13.7	8.0	29.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	5.1	23.4
Max Q Clear Time (g_c+I1), s		15.0		7.7	4.4	14.1
Green Ext Time (p_c), s		10.8		1.5	0.0	5.8

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	339	95	124	1575	1285	590
Future Volume (veh/h)	339	95	124	1575	1285	590
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	103	135	1712	1397	641
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	533	430	172	2486	1883	840
Arrive On Green	0.15	0.15	0.10	0.70	0.53	0.53
Sat Flow, veh/h	3456	2790	1781	3647	3647	1585
Grp Volume(v), veh/h	368	103	135	1712	1397	641
Grp Sat Flow(s),veh/h/ln	1728	1395	1781	1777	1777	1585
Q Serve(g_s), s	6.2	2.0	4.6	17.2	18.7	19.6
Cycle Q Clear(g_c), s	6.2	2.0	4.6	17.2	18.7	19.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	533	430	172	2486	1883	840
V/C Ratio(X)	0.69	0.24	0.79	0.69	0.74	0.76
Avail Cap(c_a), veh/h	1012	817	217	2486	1883	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	22.8	27.2	5.4	11.2	11.4
Incr Delay (d2), s/veh	1.6	0.3	13.7	1.6	2.7	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.6	2.5	4.3	6.6	7.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.2	23.1	40.8	6.9	13.9	17.9
LnGrp LOS	C	C	D	A	B	B
Approach Vol, veh/h	471			1847	2038	
Approach Delay, s/veh	25.5			9.4	15.2	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		47.5		14.0	10.4	37.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		43.0		18.0	7.5	31.0
Max Q Clear Time (g_c+I1), s		19.2		8.2	6.6	21.6
Green Ext Time (p_c), s		15.2		1.3	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	385	7	104	2	2	7	78	1380	6	32	1044	299
Future Volume (veh/h)	385	7	104	2	2	7	78	1380	6	32	1044	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	414	8	112	2	2	8	84	1484	6	34	1123	322
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	547	296	251	4	4	16	108	2000	8	60	1863	831
Arrive On Green	0.16	0.16	0.16	0.01	0.01	0.01	0.06	0.55	0.55	0.03	0.52	0.52
Sat Flow, veh/h	3456	1870	1585	276	276	1105	1781	3630	15	1781	3554	1585
Grp Volume(v), veh/h	414	8	112	12	0	0	84	726	764	34	1123	322
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1658	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	8.5	0.3	4.8	0.5	0.0	0.0	3.5	23.1	23.1	1.4	16.4	9.0
Cycle Q Clear(g_c), s	8.5	0.3	4.8	0.5	0.0	0.0	3.5	23.1	23.1	1.4	16.4	9.0
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	547	296	251	24	0	0	108	979	1029	60	1863	831
V/C Ratio(X)	0.76	0.03	0.45	0.49	0.00	0.00	0.78	0.74	0.74	0.56	0.60	0.39
Avail Cap(c_a), veh/h	836	453	383	401	0	0	175	979	1029	120	1863	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	26.5	28.4	36.4	0.0	0.0	34.4	12.7	12.7	35.4	12.3	10.6
Incr Delay (d2), s/veh	2.2	0.0	1.2	14.4	0.0	0.0	11.2	5.1	4.8	8.0	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.1	1.8	0.3	0.0	0.0	1.8	9.2	9.6	0.7	6.1	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	26.5	29.6	50.8	0.0	0.0	45.7	17.7	17.5	43.4	13.8	11.9
LnGrp LOS	C	C	C	D	A	A	D	B	B	D	B	B
Approach Vol, veh/h		534			12			1574			1479	
Approach Delay, s/veh		31.5			50.8			19.1			14.0	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	45.5		16.3	9.0	43.5		5.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	7.3	38.7		18.0
Max Q Clear Time (g_c+I1), s	3.4	25.1		10.5	5.5	18.4		2.5
Green Ext Time (p_c), s	0.0	9.5		1.3	0.0	9.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	2	95	7	7	29	124	1575	2	8	1285	590
Future Volume (veh/h)	339	2	95	7	7	29	124	1575	2	8	1285	590
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	2	103	8	8	32	135	1712	2	9	1397	641
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	493	267	226	11	11	46	169	2084	2	20	1738	775
Arrive On Green	0.14	0.14	0.14	0.04	0.04	0.04	0.09	0.57	0.57	0.01	0.49	0.49
Sat Flow, veh/h	3456	1870	1585	276	276	1105	1781	3642	4	1781	3554	1585
Grp Volume(v), veh/h	368	2	103	48	0	0	135	835	879	9	1397	641
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1658	0	0	1781	1777	1870	1781	1777	1585
Q Serve(g_s), s	7.9	0.1	4.6	2.2	0.0	0.0	5.8	29.4	29.4	0.4	25.7	26.9
Cycle Q Clear(g_c), s	7.9	0.1	4.6	2.2	0.0	0.0	5.8	29.4	29.4	0.4	25.7	26.9
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	493	267	226	69	0	0	169	1017	1070	20	1738	775
V/C Ratio(X)	0.75	0.01	0.46	0.70	0.00	0.00	0.80	0.82	0.82	0.44	0.80	0.83
Avail Cap(c_a), veh/h	802	434	368	385	0	0	186	1017	1070	115	1738	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	28.5	30.5	36.7	0.0	0.0	34.4	13.4	13.4	38.1	16.7	17.0
Incr Delay (d2), s/veh	2.3	0.0	1.4	11.9	0.0	0.0	19.9	7.4	7.1	14.5	4.1	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	1.8	1.1	0.0	0.0	3.4	12.1	12.6	0.2	10.3	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	28.5	31.9	48.6	0.0	0.0	54.3	20.8	20.5	52.6	20.7	26.9
LnGrp LOS	C	C	C	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h		473			48			1849			2047	
Approach Delay, s/veh		33.7			48.6			23.1			22.8	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	48.9		15.5	11.8	42.4		7.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	8.1	37.9		18.0
Max Q Clear Time (g_c+I1), s	2.4	31.4		9.9	7.8	28.9		4.2
Green Ext Time (p_c), s	0.0	7.3		1.1	0.0	7.1		0.1

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1771	1	0	1375
Future Vol, veh/h	0	1	1771	1	0	1375
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1925	1	0	1495

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	963	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	256	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	256	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	256	-
HCM Lane V/C Ratio	-	-	0.004	-
HCM Control Delay (s)	-	-	19.1	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	1943	0	0	1883
Future Vol, veh/h	0	5	1943	0	0	1883
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	2112	0	0	2047

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1056	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	222	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	222	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	222	-
HCM Lane V/C Ratio	-	-	0.024	-
HCM Control Delay (s)	-	-	21.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	8	112	12	84	1490	34	1123	322
v/c Ratio	0.62	0.02	0.28	0.08	0.49	0.69	0.28	0.59	0.32
Control Delay	32.9	26.4	7.9	26.0	46.2	14.9	43.0	15.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	26.4	7.9	26.0	46.2	14.9	43.0	15.6	2.8
Queue Length 50th (ft)	90	3	0	2	38	169	15	178	0
Queue Length 95th (ft)	157	16	41	19	#106	#553	49	343	46
Internal Link Dist (ft)		316		24		461		199	
Turn Bay Length (ft)	130				110				
Base Capacity (vph)	844	457	475	419	176	2163	120	1897	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.02	0.24	0.03	0.48	0.69	0.28	0.59	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	368	2	103	48	135	1714	9	1397	641
v/c Ratio	0.62	0.01	0.28	0.29	0.75	0.79	0.08	0.83	0.62
Control Delay	36.4	29.5	7.5	24.0	65.7	19.1	41.9	26.3	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	29.5	7.5	24.0	65.7	19.1	41.9	26.3	6.0
Queue Length 50th (ft)	94	1	0	8	72	353	5	351	26
Queue Length 95th (ft)	143	7	35	42	#183	#721	20	#554	126
Internal Link Dist (ft)		316		52		461		199	
Turn Bay Length (ft)	130				110				
Base Capacity (vph)	772	419	445	403	179	2160	110	1676	1042
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.00	0.23	0.12	0.75	0.79	0.08	0.83	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E

EXISTING PLUS PROJECT LOS CALCULATION WORKSHEETS

Long Beach Business Park
ULL1801
Existing Plus Project AM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.712
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	52	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	2 0	1	2 0	1 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	76	1314	6	32	980	290	374	7	101	2	2	7
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	76	1314	6	32	980	290	374	7	101	2	2	7
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	76	1314	6	32	980	290	374	7	101	2	2	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	82	1413	6	34	1054	312	402	8	109	2	2	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	1413	6	34	1054	312	402	8	109	2	2	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	82	1413	6	34	1054	312	402	8	109	2	2	8
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	2.00	1.00	1.00	0.18	0.18	0.64
Final Sat.:	1600	3185	15	1600	3200	1600	2880	1600	1600	291	291	1018
Capacity Analysis Module:												
Vol/Sat:	0.05	0.44	0.44	0.02	0.33	0.19	0.14	0.00	0.07	0.01	0.01	0.01
Crit Moves:		****		****			****					****

Long Beach Business Park
ULL1801
Existing Plus Project PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.759
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 1	0	1 0	2 0	1	2 0	1 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	120	1470	2	8	1176	573	329	2	92	7	7	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	120	1470	2	8	1176	573	329	2	92	7	7	29
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	120	1470	2	8	1176	573	329	2	92	7	7	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	130	1598	2	9	1278	623	358	2	100	8	8	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	130	1598	2	9	1278	623	358	2	100	8	8	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	130	1598	2	9	1278	623	358	2	100	8	8	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	2.00	1.00	1.00	0.16	0.16	0.68
Final Sat.:	1600	3196	4	1600	3200	1600	2880	1600	1600	260	260	1079
Capacity Analysis Module:												
Vol/Sat:	0.08	0.50	0.50	0.01	0.40	0.39	0.12	0.00	0.06	0.03	0.03	0.03
Crit Moves:		****		****			****				****	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	374	7	101	2	2	7	76	1314	6	32	980	290
Future Volume (veh/h)	374	7	101	2	2	7	76	1314	6	32	980	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	402	8	109	2	2	8	82	1413	6	34	1054	312
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	535	290	246	4	4	16	106	2008	9	61	1877	837
Arrive On Green	0.15	0.15	0.15	0.01	0.01	0.01	0.06	0.55	0.55	0.03	0.53	0.53
Sat Flow, veh/h	3456	1870	1585	276	276	1105	1781	3629	15	1781	3554	1585
Grp Volume(v), veh/h	402	8	109	12	0	0	82	692	727	34	1054	312
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1658	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	8.2	0.3	4.6	0.5	0.0	0.0	3.4	21.1	21.1	1.4	14.7	8.6
Cycle Q Clear(g_c), s	8.2	0.3	4.6	0.5	0.0	0.0	3.4	21.1	21.1	1.4	14.7	8.6
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	535	290	246	24	0	0	106	983	1033	61	1877	837
V/C Ratio(X)	0.75	0.03	0.44	0.49	0.00	0.00	0.78	0.70	0.70	0.56	0.56	0.37
Avail Cap(c_a), veh/h	840	454	385	403	0	0	176	983	1033	120	1877	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	26.6	28.4	36.2	0.0	0.0	34.4	12.1	12.1	35.2	11.7	10.3
Incr Delay (d2), s/veh	2.1	0.0	1.3	14.4	0.0	0.0	11.5	4.2	4.0	7.9	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.1	1.8	0.3	0.0	0.0	1.8	8.3	8.6	0.7	5.4	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	26.6	29.7	50.6	0.0	0.0	45.8	16.3	16.1	43.2	13.0	11.5
LnGrp LOS	C	C	C	D	A	A	D	B	B	D	B	B
Approach Vol, veh/h		519			12			1501			1400	
Approach Delay, s/veh		31.5			50.6			17.8			13.4	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	45.5		16.0	8.9	43.6		5.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	7.3	38.7		18.0
Max Q Clear Time (g_c+I1), s	3.4	23.1		10.2	5.4	16.7		2.5
Green Ext Time (p_c), s	0.0	9.7		1.2	0.0	9.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1694	1	0	1302
Future Vol, veh/h	0	1	1694	1	0	1302
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1841	1	0	1415

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	921	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	273	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	273	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	273	-
HCM Lane V/C Ratio	-	-	0.004	-
HCM Control Delay (s)	-	-	18.2	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	2	92	7	7	29	120	1470	2	8	1176	573
Future Volume (veh/h)	329	2	92	7	7	29	120	1470	2	8	1176	573
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	358	2	100	8	8	32	130	1598	2	9	1278	623
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	262	222	12	12	46	163	2087	3	20	1751	781
Arrive On Green	0.14	0.14	0.14	0.04	0.04	0.04	0.09	0.57	0.57	0.01	0.49	0.49
Sat Flow, veh/h	3456	1870	1585	276	276	1105	1781	3642	5	1781	3554	1585
Grp Volume(v), veh/h	358	2	100	48	0	0	130	780	820	9	1278	623
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1658	0	0	1781	1777	1870	1781	1777	1585
Q Serve(g_s), s	7.6	0.1	4.5	2.2	0.0	0.0	5.5	25.7	25.7	0.4	21.9	25.3
Cycle Q Clear(g_c), s	7.6	0.1	4.5	2.2	0.0	0.0	5.5	25.7	25.7	0.4	21.9	25.3
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	262	222	69	0	0	163	1018	1071	20	1751	781
V/C Ratio(X)	0.74	0.01	0.45	0.69	0.00	0.00	0.80	0.77	0.77	0.44	0.73	0.80
Avail Cap(c_a), veh/h	809	438	371	388	0	0	188	1018	1071	116	1751	781
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	28.5	30.4	36.4	0.0	0.0	34.2	12.5	12.5	37.8	15.5	16.3
Incr Delay (d2), s/veh	2.3	0.0	1.4	11.8	0.0	0.0	18.6	5.5	5.2	14.5	2.7	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	1.7	1.1	0.0	0.0	3.2	10.2	10.7	0.2	8.6	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	28.5	31.8	48.2	0.0	0.0	52.8	18.0	17.7	52.3	18.2	24.6
LnGrp LOS	C	C	C	D	A	A	D	B	B	D	B	C
Approach Vol, veh/h		460			48			1730			1910	
Approach Delay, s/veh		33.5			48.2			20.5			20.4	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	48.6		15.3	11.6	42.4		7.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	8.1	37.9		18.0
Max Q Clear Time (g_c+I1), s	2.4	27.7		9.6	7.5	27.3		4.2
Green Ext Time (p_c), s	0.0	9.0		1.1	0.0	7.8		0.1

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	1828	0	0	1757
Future Vol, veh/h	0	5	1828	0	0	1757
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	1987	0	0	1910

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	994	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	244	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	244	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	244	-
HCM Lane V/C Ratio	-	-	0.022	-
HCM Control Delay (s)	-	-	20.1	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	402	8	109	12	82	1419	34	1054	312
v/c Ratio	0.62	0.02	0.28	0.08	0.48	0.65	0.28	0.55	0.31
Control Delay	33.0	26.6	7.7	25.9	45.3	13.8	42.7	14.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	26.6	7.7	25.9	45.3	13.8	42.7	14.7	2.7
Queue Length 50th (ft)	87	3	0	2	36	153	15	162	0
Queue Length 95th (ft)	152	16	39	19	#102	#467	49	314	45
Internal Link Dist (ft)		316		24		461		199	
Turn Bay Length (ft)	130				110				
Base Capacity (vph)	848	460	478	422	177	2175	121	1908	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.02	0.23	0.03	0.46	0.65	0.28	0.55	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	368	2	100	48	130	1600	9	1278	623
v/c Ratio	0.62	0.01	0.27	0.29	0.73	0.74	0.08	0.76	0.59
Control Delay	36.4	29.5	7.1	24.0	62.9	17.5	41.9	23.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	29.5	7.1	24.0	62.9	17.5	41.9	23.4	4.7
Queue Length 50th (ft)	94	1	0	8	70	309	5	304	10
Queue Length 95th (ft)	143	7	33	42	#175	#647	20	#446	85
Internal Link Dist (ft)		316		52		461		199	
Turn Bay Length (ft)	130				110				
Base Capacity (vph)	772	419	445	403	179	2160	110	1676	1060
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.00	0.22	0.12	0.73	0.74	0.08	0.76	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX F

LOYNES DRIVE ROAD DIET LOS CALCULATION WORKSHEETS

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project + Road Diet AM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.707
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	51	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2 0	0	0 0	2 0	1	2 0	0 0	2	0 0	0 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	78	1379	0	0	1044	299	385	0	104	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	1379	0	0	1044	299	385	0	104	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	1379	0	0	1044	299	385	0	104	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	84	1483	0	0	1123	322	414	0	112	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	1483	0	0	1123	322	414	0	112	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	1483	0	0	1123	322	414	0	112	0	0	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.46	0.00	0.00	0.35	0.20	0.14	0.00	0.03	0.00	0.00	0.00
Crit Moves:		****		****			****					

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project + Road Diet PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.763
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 2	0	0	0	0 2	0	1	2	0	0	0 2	0	0	0	0 0
Volume Module: >> Count Date: 12 Sep 2018 <<																
Base Vol:	124	1575	0	0	1285	590	339	0	95	0	0	0				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	124	1575	0	0	1285	590	339	0	95	0	0	0				
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0				
Initial Fut:	124	1575	0	0	1285	590	339	0	95	0	0	0				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
PHF Volume:	135	1712	0	0	1397	641	368	0	103	0	0	0				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	135	1712	0	0	1397	641	368	0	103	0	0	0				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	135	1712	0	0	1397	641	368	0	103	0	0	0				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	2.00	0.00	0.00	0.00				
Final Sat.:	1600	3200	0	0	3200	1600	2880	0	3200	0	0	0				
Capacity Analysis Module:																
Vol/Sat:	0.08	0.53	0.00	0.00	0.44	0.40	0.13	0.00	0.03	0.00	0.00	0.00				
Crit Moves:		****		****			****									

Long Beach Business Park
ULL1801
Project Build-Out (2020) + Project AM with Road Diet

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.726
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	54	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 1	0	1 0	2 0	1	1 1	0 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	78	1380	6	32	1044	299	385	7	104	2	2	7
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	1380	6	32	1044	299	385	7	104	2	2	7
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	1380	6	32	1044	299	385	7	104	2	2	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	84	1484	6	34	1123	322	414	8	112	2	2	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	1484	6	34	1123	322	414	8	112	2	2	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	1484	6	34	1123	322	414	8	112	2	2	8
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	1.96	0.04	1.00	0.18	0.18	0.64
Final Sat.:	1600	3186	14	1600	3200	1600	3143	57	1600	291	291	1018
Capacity Analysis Module:												
Vol/Sat:	0.05	0.47	0.47	0.02	0.35	0.20	0.13	0.13	0.07	0.01	0.01	0.01
Crit Moves:		****		****				****				****

Long Beach Business Park
ULL1801
2020 Build-Out + Cumulative Project + Project + Road Diet PM

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Studebaker Rd/Loynes Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.786
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	64	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 1	0	1 0	2 0	1	1 1	0 0	1	0 0	1! 0	0
Volume Module: >> Count Date: 12 Sep 2018 <<												
Base Vol:	124	1575	2	8	1285	590	339	2	95	7	7	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	124	1575	2	8	1285	590	339	2	95	7	7	29
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	124	1575	2	8	1285	590	339	2	95	7	7	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	135	1712	2	9	1397	641	368	2	103	8	8	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	135	1712	2	9	1397	641	368	2	103	8	8	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	135	1712	2	9	1397	641	368	2	103	8	8	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	1.99	0.01	1.00	0.16	0.16	0.68
Final Sat.:	1600	3196	4	1600	3200	1600	3181	19	1600	260	260	1079
Capacity Analysis Module:												
Vol/Sat:	0.08	0.54	0.54	0.01	0.44	0.40	0.12	0.12	0.06	0.03	0.03	0.03
Crit Moves:		****		****				****			****	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	385	104	78	1379	1044	299
Future Volume (veh/h)	385	104	78	1379	1044	299
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	414	112	84	1483	1123	322
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	618	284	121	2282	1730	774
Arrive On Green	0.18	0.18	0.07	0.64	0.49	0.49
Sat Flow, veh/h	3442	1583	1774	3632	3632	1583
Grp Volume(v), veh/h	414	112	84	1483	1123	322
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770	1770	1583
Q Serve(g_s), s	5.7	3.2	2.4	13.1	12.2	6.7
Cycle Q Clear(g_c), s	5.7	3.2	2.4	13.1	12.2	6.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	618	284	121	2282	1730	774
V/C Ratio(X)	0.67	0.39	0.70	0.65	0.65	0.42
Avail Cap(c_a), veh/h	1210	557	177	2282	1730	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	18.5	23.3	5.6	9.8	8.4
Incr Delay (d2), s/veh	1.3	0.9	7.0	1.5	1.9	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.0	1.4	6.6	6.2	7.3
LnGrp Delay(d),s/veh	20.9	19.4	30.3	7.0	11.7	10.0
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	526			1567	1445	
Approach Delay, s/veh	20.6			8.3	11.3	
Approach LOS	C			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		37.5		13.7	8.0	29.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		33.0		18.0	5.1	23.4		
Max Q Clear Time (g_c+I1), s		15.1		7.7	4.4	14.2		
Green Ext Time (p_c), s		10.7		1.4	0.0	5.8		

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	339	95	124	1575	1285	590
Future Volume (veh/h)	339	95	124	1575	1285	590
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	103	135	1712	1397	641
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	531	244	172	2487	1884	840
Arrive On Green	0.15	0.15	0.10	0.70	0.53	0.53
Sat Flow, veh/h	3456	1585	1781	3647	3647	1585
Grp Volume(v), veh/h	368	103	135	1712	1397	641
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1585
Q Serve(g_s), s	6.2	3.6	4.6	17.1	18.7	19.6
Cycle Q Clear(g_c), s	6.2	3.6	4.6	17.1	18.7	19.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	531	244	172	2487	1884	840
V/C Ratio(X)	0.69	0.42	0.79	0.69	0.74	0.76
Avail Cap(c_a), veh/h	1012	464	217	2487	1884	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	23.5	27.1	5.3	11.2	11.4
Incr Delay (d2), s/veh	1.6	1.2	13.7	1.6	2.7	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.1	2.5	4.3	6.6	7.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.3	24.7	40.8	6.9	13.8	17.9
LnGrp LOS	C	C	D	A	B	B
Approach Vol, veh/h	471			1847	2038	
Approach Delay, s/veh	25.9			9.4	15.1	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		47.5		13.9	10.4	37.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		43.0		18.0	7.5	31.0
Max Q Clear Time (g_c+I1), s		19.1		8.2	6.6	21.6
Green Ext Time (p_c), s		15.2		1.2	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	13.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	385	7	104	2	2	7	78	1380	6	32	1044	299
Future Volume (veh/h)	385	7	104	2	2	7	78	1380	6	32	1044	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	420	0	112	2	2	8	84	1484	6	34	1123	322
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	558	0	248	4	4	16	108	2005	8	60	1867	833
Arrive On Green	0.16	0.00	0.16	0.01	0.01	0.01	0.06	0.55	0.55	0.03	0.53	0.53
Sat Flow, veh/h	3563	0	1585	276	276	1105	1781	3630	15	1781	3554	1585
Grp Volume(v), veh/h	420	0	112	12	0	0	84	726	764	34	1123	322
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1658	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	8.4	0.0	4.8	0.5	0.0	0.0	3.5	23.0	23.0	1.4	16.3	9.0
Cycle Q Clear(g_c), s	8.4	0.0	4.8	0.5	0.0	0.0	3.5	23.0	23.0	1.4	16.3	9.0
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	558	0	248	24	0	0	108	981	1031	60	1867	833
V/C Ratio(X)	0.75	0.00	0.45	0.49	0.00	0.00	0.78	0.74	0.74	0.56	0.60	0.39
Avail Cap(c_a), veh/h	864	0	384	402	0	0	175	981	1031	120	1867	833
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	28.4	36.3	0.0	0.0	34.4	12.6	12.6	35.3	12.2	10.5
Incr Delay (d2), s/veh	2.1	0.0	1.3	14.4	0.0	0.0	11.2	5.0	4.8	7.9	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	1.8	0.3	0.0	0.0	1.8	9.2	9.6	0.7	6.1	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	29.7	50.7	0.0	0.0	45.6	17.6	17.4	43.3	13.7	11.8
LnGrp LOS	C	A	C	D	A	A	D	B	B	D	B	B
Approach Vol, veh/h		532			12			1574			1479	
Approach Delay, s/veh		31.5			50.7			19.0			13.9	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	45.5		16.1	9.0	43.5		5.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	7.3	38.7		18.0
Max Q Clear Time (g_c+I1), s	3.4	25.0		10.4	5.5	18.3		2.5
Green Ext Time (p_c), s	0.0	9.5		1.3	0.0	9.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1771	1	0	1375
Future Vol, veh/h	0	1	1771	1	0	1375
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1925	1	0	1495

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	963	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	256	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	256	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	256	-
HCM Lane V/C Ratio	-	-	0.004	-
HCM Control Delay (s)	-	-	19.1	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	2	95	7	7	29	124	1575	2	8	1285	590
Future Volume (veh/h)	339	2	95	7	7	29	124	1575	2	8	1285	590
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	369	0	103	8	8	32	135	1712	2	9	1397	641
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	499	0	222	11	11	46	169	2090	2	20	1743	778
Arrive On Green	0.14	0.00	0.14	0.04	0.04	0.04	0.09	0.57	0.57	0.01	0.49	0.49
Sat Flow, veh/h	3563	0	1585	276	276	1105	1781	3642	4	1781	3554	1585
Grp Volume(v), veh/h	369	0	103	48	0	0	135	835	879	9	1397	641
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1658	0	0	1781	1777	1870	1781	1777	1585
Q Serve(g_s), s	7.7	0.0	4.6	2.2	0.0	0.0	5.7	29.2	29.2	0.4	25.5	26.7
Cycle Q Clear(g_c), s	7.7	0.0	4.6	2.2	0.0	0.0	5.7	29.2	29.2	0.4	25.5	26.7
Prop In Lane	1.00		1.00	0.17		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	499	0	222	69	0	0	169	1020	1073	20	1743	778
V/C Ratio(X)	0.74	0.00	0.46	0.70	0.00	0.00	0.80	0.82	0.82	0.44	0.80	0.82
Avail Cap(c_a), veh/h	830	0	369	386	0	0	187	1020	1073	115	1743	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	0.0	30.6	36.5	0.0	0.0	34.3	13.2	13.2	37.9	16.5	16.8
Incr Delay (d2), s/veh	2.2	0.0	1.5	11.9	0.0	0.0	19.8	7.3	7.0	14.5	4.0	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	1.8	1.1	0.0	0.0	3.3	12.0	12.5	0.2	10.2	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	32.1	48.4	0.0	0.0	54.0	20.5	20.2	52.5	20.5	26.5
LnGrp LOS	C	A	C	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h		472			48			1849			2047	
Approach Delay, s/veh		33.6			48.4			22.8			22.5	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	48.8		15.3	11.8	42.4		7.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	41.0		18.0	8.1	37.9		18.0
Max Q Clear Time (g_c+I1), s	2.4	31.2		9.7	7.7	28.7		4.2
Green Ext Time (p_c), s	0.0	7.5		1.1	0.0	7.2		0.1

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	1943	0	0	1883
Future Vol, veh/h	0	5	1943	0	0	1883
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	2112	0	0	2047

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1056	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	222	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	222	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	222	-
HCM Lane V/C Ratio	-	-	0.024	-
HCM Control Delay (s)	-	-	21.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	-