ATTACHMENT F

CALIFORNIA ENVIRONMENTAL QUALITY ACT
STATEMENT OF SUPPORT
CLASS 32 (INFILL DEVELOPMENT) EXEMPTION DETERMINATION
5801 Atlantic Avenue
Application No. 2105-07
September 2, 2021

Section 15300 through 15333 of the California Environmental Quality Act (CEQA) establishes certain classes of projects as categorically exempt from the provisions of CEQA because they do not ordinarily result in a significant effect on the environment. The Project proposes to construct 84 three-story townhome style residential project and 2,294 square feet of commercial space within a vacant, undeveloped 3.20 acre site in conjunction with aa Tentative Tract Map for the merger of the existing lots to create a two lot subdivision for 84 airspace residential condominiums on Parcel 1 and a 3,600 square foot site for the commercial uses on Parcel 2 located at 5801 -5893 Atlantic Avenue, 5882-5892 Linden Avenue and 501 East South Street in the Mixed Use 3-A Zoning District (MU3-A (District 9).

CEQA Section 15300.2 provides specific instance where exceptions to the established Classes of Exemptions included Class 32 -Infill Exemption are superseded; none of those conditions were found to apply to this project. The following analysis provides substantial evidence to support a conclusion that the proposed project qualifies for an exemption under CEQA Guidelines Section 15332 as a Class 32 urban infill development and would not have a significant effect on the environment.

A. THE PROJECT IS CONSISTENT WITH THE APPLICABLE GENERAL PLAN DESIGNATION AND ALL APPLICAPBLE GENERAL PLAN POLICIES AS WELL AS WITH APPLICABLE ZONING DESIGNATION AND REGULATIONS.

The project site is in the MU3-A Zoning District of the updated Zoning Code (Title 22); a designation which allows a variety of different uses including the highest intensity neighborhood activity centers in proximity to bus routes and multi-modal corridors. This zone permits horizontal and vertical mixed uses. include multi-family residential, civic and institutional uses, business/retail/professional and personal uses, financial services, grocery stores, and restaurants. This Zoning designation is consistent with the General Plan Land Use Designation (LUD) Neighborhood Serving Centers and Corridors-Moderate (NSC-M). The project would comply with all development standards and implements the General Plan objectives to provide a balance of housing opportunities, adequate off-site parking, consistency with street design standards that accommodate multi-modal transportation opportunities including segregated bicycle lanes and wider sidewalks for pedestrians.

B. THE PROPOSED DEVELOPMENT OCCURS WITHIN CITY LIMITS ON A PROJECT SITE OF NO MORE THAN FIVE ACREA SUBSTANTIALLY SURROUNDED BY URBAN USES.

The project site is entirely within the city limits of Long beach, on a site that is 3.20-acre in size, which is less than maximum five acres specified. The project site is bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south and Linden Avenue to the west. The project site was developed with a number of different uses, including a gas station, dry cleaners, medical offices, banks, appliance store, general office and residential. The surrounding area is entirely developed with urban uses including Michelle Obama Library, commercial uses, and multi-family and single-family uses.

C. THE PROJECT SITE HAS NO VALUE AS HABITAT FOR ENDANGERED, RARE OR THREATNED SPECIES.

The project site is vacant and void of any structures and very limited vegetation. There is no value as a habitat for endangered, rare or threatened species.

D. APPROVAL OF THE PROJECT WOULD NOT RESULT IN ANY SIGNIFICANT EFFECTS REALTING TO TRAFFIC, NOISE, AIR QUALITY, OR WATER QUALITY.

The project will not result in any significant effects relating to traffic within the area or on the local streets as detailed in the Traffic Study prepared by Linscott Law & Greenspan Engineers, Inc. and dated April 20, 2021, revised June 10, 2021 and is incorporated by reference here.[1]

The scope of work includes construction of an 84-unit multi-family residential development that includes approximately 2,000 square feet of café/retail uses. Parking included for the project includes 39 on street spaces, and 190 spaces on-site, broken down into 168 attached garage spaces and 22 surface guest parking stalls. Vehicular access to the site is provided via Linden Avenue, a local street, which is unsignalized. There are several other pedestrian and bicycle accessways to the site from 59th Street, Atlantic Avenue and South Street. Construction of the project will include remedial grading at the site, which is only expected to add 12 trips produced in both the AM and PM peak hours.

A Vehicle Miles Traveled (VMT) analysis was conducted for both the residential component and the commercial component. Because the residential portion of the project is located within ½ a mile of an existing high-quality transit corridor, the project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT. Furthermore, because the retail component is less than 50,000square feet it is likely considered to be local serving and would tend to shorten trips. Any retail project with less than 50,000square feet or less will be presumed to have less than significant transportation impact related to CEQA Guidelines Section 15064.3,

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[1] Referenced documents are attached to these findings herein.

subdivision(b). Since the City has identified a 500-trip threshold for screening small projects, the residential component of the project falls below the 500-trip threshold for VMT analysis. The construction and clean-up component of the proposed project is expected to generate 78 daily trips which also falls below the 500-trip threshold for VMT analysis. Therefore, both the residential component and construction component can be presumed to have a less than significant impact on VMT.

The air quality and greenhouse gas technical study determines whether the estimated criteria air pollutants and greenhouse gas emissions generated form the construction (including site remediation) and operation of the project would cause significant impacts to air resources. The tables on the next page show a summary of the air emissions from both the construction segment of the project and the operations segment of the project as generated by CalEEMod. Both of the tables show that the daily emissions will be below the applicable SCAQMD air quality standards and thresholds of significance.

Daily Air Quality Emissions -- Construction

MAXIMUM DAILY EMISSIONS (lbs/day)[1, 2]						
Activity	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Site Remediation	1.78	47.34	13.45	0.16	5.30	1.90
Site Preparation	3.24	33.13	20.41	0.04	9.33	5.40
Grading	2.0	20.90	15.86	0.03	3.82	2.22
Building Construction	2.07	16.88	20.21	0.04	1.95	1.08
Paving	1.27	9.58	12.98	0.02	0.71	0.51
Architectural Coating	31.51	1.35	2.46	0.00	0.27	0.13
Maximum	**31.51**	**33.13**	**20.41**	**0.04**	**9.33**	**5.40**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

1. Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
2. Includes standard fugitive dust control measures.

Daily Air Quality Emissions -- Operations

MAXIMUM DAILY EMISSIONS (lbs/day)*						
Activity	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Mobile Sources	1.22	1.63	14.26	0.04	3.86	1.04
Energy Resources	0.05	0.40	0.22	0.00	0.03	0.03
Area Resources	2.23	1.26	7.44	0.01	0.13	0.13
Total	**3.49**	**3.30**	**21.92**	**0.05**	**4.03**	**1.21**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

*Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

Noise impacts are divided into four (4) separate areas. (1) excessive off-site construction noise impacts; (2) excessive off-site operational noise impacts (3) excessive on-site interior noise impacts; and (4) excessive on-site exterior use area noise impacts. According to the Noise Technical report prepared by Helix Environmental Planning dated

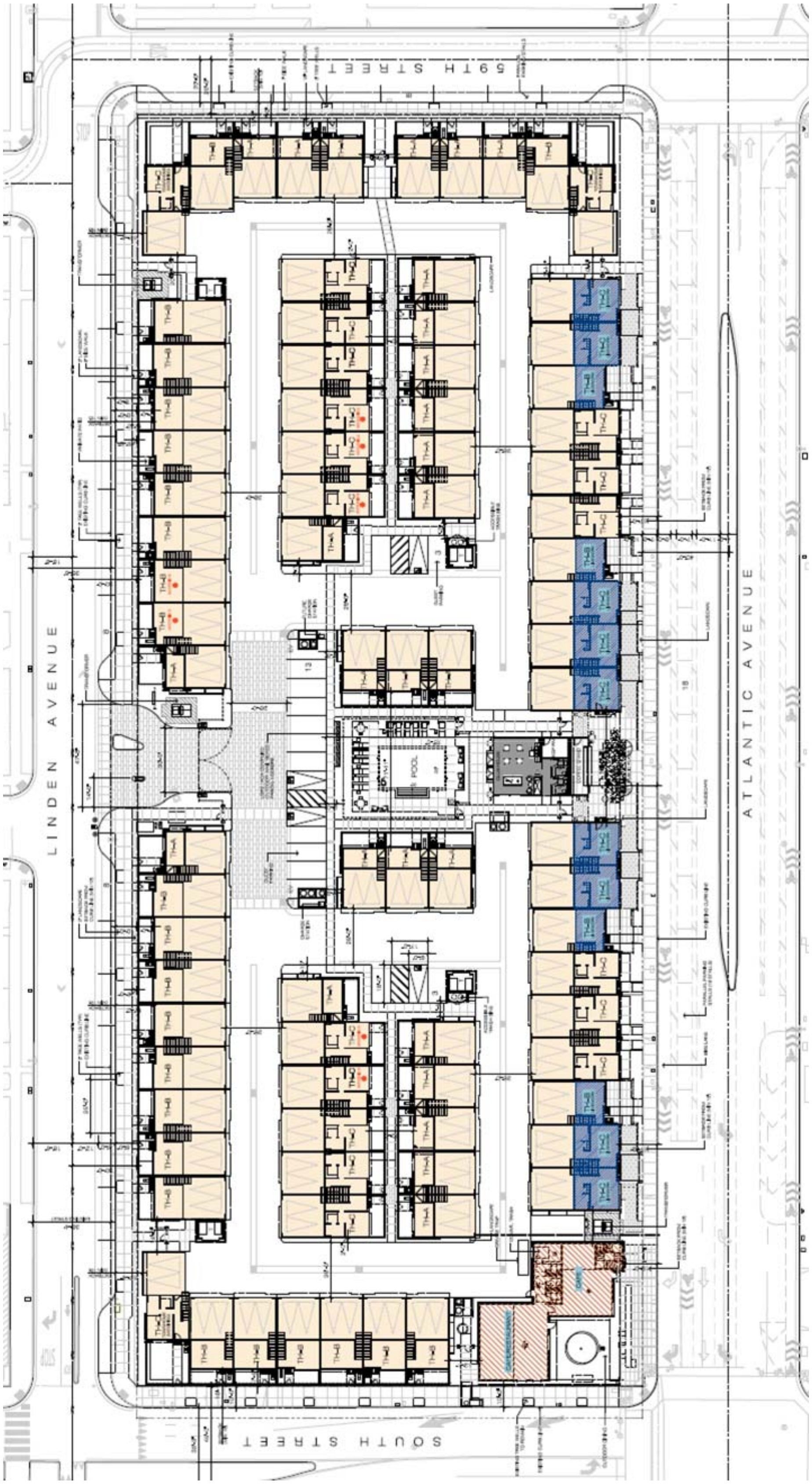
June, 2021 construction noise impacts are temporary in nature and would be limited by the City's Noise Ordinance contained in the Municipal Code. The ambient noise environment of the Project site consists primarily of traffic noise from the adjacent streets. Operational noise associated with the dwelling units would be generated by vehicles, doors, car alarms, music, and people talking. Furthermore, the project has been conditioned to prohibit noise levels from the project to exceed the noise standards specified in the Long Beach Municipal Code.

The site is not identified as a contaminated or spill site, according to the Department of Toxic Substance Control's (DTSC) database EnviroStor. However, because of the prior uses identified in the Phase 1 and Phase 2 reports (gas station and dry cleaners), the Applicant is voluntarily working with the Department of Substances Control to clean up the southernmost portion of the property adjacent to South Street. According to verbal conversations with representatives of DTSC, the proposed cleanup efforts will not have an impact upon the surrounding area as shown in the technical reports referenced herein. Furthermore, the proposed project will comply with all requirements of the Long Beach Municipal Code Chapter 18.74 pertaining to low impact development standards and practices for stormwater pollution mitigation.

E. THE SITE CAN BE ADEQUATELY SERVED BY ALL REQUIRED UTILITIES AND PUBLIC SERVICES.

The existing site is located within the middle of an urbanized area with existing utilities. The prior uses at the site many years ago were served by utilities and public services. The Project can adequately be served (evidenced by will-serve letters on file) by utilities and public by reestablishing connections for water, sewer, electricity, and natural gas, which would be undertaken as part of the building permitting process.

ATLANTIC AVENUE MIXED USE PROJECT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Long Beach, California



RK engineering group, inc.

ATLANTIC AVENUE MIXED USE PROJECT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Long Beach, California

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1.0 Introduction

The purpose of this air quality and greenhouse gas (GHG) impact study is to determine whether the estimated criteria air pollutants and greenhouse gas emissions generated from the construction and operation of the proposed Atlantic Avenue Mixed Use Project (hereinafter referred to as project) would cause significant impacts to air resources.

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Long Beach recommendations for quantification of emissions and evaluation of potential impacts.

1.1 Site Location

The project site is located at the northwest corner of Atlantic Avenue and South Street, in the City of Long Beach. The project site is bounded by 59th Street to the north, South Street to the south, Atlantic Avenue to the east and Linden Avenue to the west. The project site is currently vacant.

The project site is located within the South Coast Air Basin (SCAB), the SCAQMD Coastal General Forecast Area, and the South Los Angeles County Coastal Air Monitoring Area #4.

The project location map is provided in Exhibit A.

1.2 Project Description

The project consists of constructing and operating eighty four (84) residential townhome dwelling units and approximately 2,000 square feet of restaurant use on a 3.20 acre site.

Construction of the project is estimated to begin in the year 2021 and last approximately 14 months. Construction activities are expected to consist of site remediation, site preparation, grading, building construction, paving, and architectural coating.

During site remediation, a total of approximately 1,914 cubic yards of contaminated soil will be removed from the site and trucked to Arizona for disposal. Grading earthwork for the project is expected to balance. All parcels are currently vacant and demolition is not expected to be required as part of the project. The site plan used for this analysis is illustrated on Exhibits B.

Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Land Use	Amount	Metric
Multifamily Housing (Mid-Rise)	84	D.U.
High Turnover Restaurant	2.000	T.S.F.
Paved Surfaces (Parking & Drive Aisles)	66.433	T.S.F.

[1] D.U. = Dwelling Unit
T.S.F. = Thousand Square Feet

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24-hours or longer, such as residences, hospitals, and schools (etc), as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses to the project site include the following:

- Residential homes located to the west of the site, along Linden Avenue, less than 25 meters to the project site.

- Residential homes located to the north of the site, along 59th Street, less than 25 meters to the project site.

- Residential homes located to the northeast of the site, along 59th Street, less than 50 meters to the project site.

- Residential homes located to the south of the site, along Linden Avenue, less than 100 meters to the project site.

1.4 Summary of Air Quality Impacts

Table 2 provides a summary of the CEQA air quality impact analysis results.

Table 2
CEQA Air Quality Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with, or obstruct implementation of, the applicable air quality plan?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

1.5 Summary of Greenhouse Gas Impacts

Table 3 provides a summary of the CEQA GHG impact criteria analysis results.

Table 3
CEQA GHG Impact Criteria

GHG Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases?			X	

1.6 Recommended Project Design Features

This section provides a summary of the recommended project design features that will help reduce the project's air quality and GHG emissions. Design features include standard rules and requirements, best practices, and building design standards. Design features are not typically considered mitigation under CEQA.

Construction Design Features:

DF-1 Prior to the issuance of grading and building permits, the project will prepare and submit a Construction Management Plan to the City of Long Beach that demonstrates the ability to implement the fugitive dust control and construction emissions reductions measures described in this report.

DF-2 The project will follow the standard SCAQMD rules and requirements with regards to fugitive dust control, including, but not limited to:

1. All active and exposed construction areas shall be watered two (2) times daily.
2. Vehicle speed on unpaved surfaces shall be reduced to less than 5 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).

9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.

10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.

11. Replace the ground cover of disturbed areas as quickly possible.

DF-3 All diesel construction equipment will have Tier 4 low emission “clean diesel” engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-4 Construction equipment shall be maintained in proper tune.

DF-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-6 Minimize the simultaneous operation of multiple construction equipment units, to the maximum extent feasible.

DF-7 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the “Unhealthy” level.

DF-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-9 Establish staging areas for the construction equipment that as far from adjacent residential homes, as feasible.

DF-10 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

Operational Design Features:

DF-11 The project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to:

- Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
- Provide the necessary infrastructure to support electric vehicle charging.
- Provide bicycle racks for non-residential uses.
- Provide solar installations per the prescribed Energy Design Ratings.

DF-12 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-13 Encourage the property management company and landscape maintenance crews to use electric powered landscaping equipment for landscape maintenance.

DF-14 Utilize zero VOC and low VOC paints and solvents, wherever possible.

2.0 Air Quality Setting

The Federal Clean Air Act (§ 7602) defines air pollution as any agent or combination of such agents, including any physical, chemical, biological, or radioactive substance which is emitted into or otherwise enters the ambient air. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Air pollution can cause disease, allergies and even death. It affects soil, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate. It can also cause damage to and deterioration of property, present hazards to transportation, and negatively impact the economy.

This section provides background information on criteria air pollutants, the applicable federal, state and local regulations concerning air pollution, and the existing physical setting of the project within the context of local air quality.

2.1 Description of Air Pollutants[1].

The following section describes the air pollutants of concern related to the project. Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The following descriptions of criteria air pollutants have been provided by the SCAQMD.

- **Carbon Monoxide (CO)** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, and competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking

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[1] SCAQMD. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (May 6, 2005)

increases the background level of CO in their blood. The South Coast basin has recently achieved attainment status for carbon monoxide by both USEPA and CARB.

- **Nitrogen Dioxide (NO_2)** is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in young children has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light which results in a brownish red cast to the atmosphere and reduced visibility. Although NO_2 concentrations have not exceeded national standards since 1991 and the state hourly standard since 1993, NO_x emissions remain of concern because of their contribution to the formation of O_3 and particulate matter.

- **Ozone (O_3)** is one of several substances called photochemical oxidants that are formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. O_3 concentrations in the South Coast basin are typically among the highest in the nation, and the damaging effects of photochemical smog, which is a popular name for a number of oxidants in combination, are generally related to the concentrations of O_3. Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the subgroups most susceptible to O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. The South Coast Air Basin is designated by the USEPA as an extreme non-attainment area for ozone. Although O_3 concentrations have declined substantially since the early 1990s, the South Coast basin continues to have peak O_3 levels that exceed both state and federal standards.

- **Fine Particulate Matter (PM_{10})** consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs, contributing to respiratory problems. PM_{10} arises from such sources as re-entrained road dust, diesel soot, combustion products, tire and brake abrasion, construction operations, and fires. It is also formed in the atmosphere from NO_x and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility. Inhalable particulates pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Inhalable particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance. The South Coast basin has recently achieved federal attainment status for PM_{10}, but is non-attainment based on state requirements.

- **Ultra-Fine Particulate Matter ($PM_{2.5}$)** is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. $PM_{2.5}$ consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, finer dust particles, and the combustion of fuels, including diesel soot. $PM_{2.5}$ can cause exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease, declines in pulmonary function growth in children, and increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma. The South Coast basin is designated as non-attainment for $PM_{2.5}$ by both federal and state standards.

- **Sulfur dioxide (SO_2)** is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Individuals with asthma may experience constriction of airways with exposure to SO_2. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in SO_2 emissions are needed because SO_2 is a precursor to sulfate and PM_{10}. The South Coast basin is considered a SO_2 attainment area by USEPA and CARB.

- **Lead (Pb)** is a toxic heavy metal that can be emitted into the air through some industrial processes, burning of leaded gasoline and past use of lead-based consumer products. Lead is a neurotoxin that accumulates in soft tissues and bones, damages the nervous system, and causes blood disorders. It is particularly problematic in children, in that permanent brain damage may result, even if blood levels are promptly normalized with treatment. Concentrations of lead once exceeded the state and federal air quality standards by a wide margin, but as a result of the removal of lead from motor vehicle gasoline, ambient air quality standards for lead have not been exceeded since 1982. Though special monitoring sites immediately downwind of lead sources recorded localized violations of the state standard in 1994, no violations have been recorded since. Consequently, the South Coast basin is designated as an attainment area for lead by both the USEPA and CARB. This report does not analyze lead emissions from the project, as it is not expected to emit lead in any significant measurable quantity.

- **Volatile Organic Compounds (VOC),** although not actually a criteria air pollutant, VOCs are regulated by the SCAQMD because they cause chemical reactions which contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels. Sources of VOCs include combustion engines, and evaporative emissions associated with fuel, paints and solvents, asphalt paving, and the use of household consumer products such as aerosols. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC. Some hydrocarbon components classified as VOC emissions are hazardous air pollutants. Benzene, for example, is a hydrocarbon component of VOC emissions that are known to be a human carcinogen. The term reactive organic gases (ROG) are often used interchangeably with VOC.

- **Toxic Air Contaminants (TACs)** are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, and for which there is no concentration that does not present some risk. This contrasts with the criteria pollutants, in that there is no threshold level for TAC exposure below which adverse health impacts are not expected to occur. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most common being diesel particulate matter (DPM) from diesel engine exhaust. In addition to DPM, benzene and 1,3-butadiene are also significant contributors to overall ambient public health risk in California.

2.2 Federal and State Ambient Air Quality Standards

The Federal Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants considered harmful to public health and the environment. The State of California has also established additional and more stringent California Ambient Air Quality Standards (CAAQS) in addition to the seven criteria pollutants designated by the federal government.

AAQS are designed to protect the health and welfare of the populace with a reasonable margin of safety. The standards are divided into two categories, primary standards, and secondary standards. Primary standards are implemented to provide protection for the "sensitive" populations such as those with asthma, or the children and elderly. Secondary standards are to provide protection against visible pollution as well as damage to the surrounding environment, including animals, crops, and buildings.

Table 4 shows the Federal and State Ambient Air Quality Standards.

Table 4
Federal and State Ambient Air Quality Standards (AAQS)[1]

Air Pollutant	Averaging Time [2]	Federal Standard (NAAQS)[2]	**California Standard (CAAQS)[2]**
Ozone	1 Hour	--	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1 Hour	35 ppm	20 ppm
	8 Hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.100 ppm	0.18 ppm
	Annual	0.053 ppm	0.030 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.075 ppm	0.25 ppm
	3 Hour	0.5 ppm[3]	--
	24 Hour	--	0.04 ppm
Particulate Matter (PM_{10})	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Mean	--	20 $\mu g/m^3$
Particulate Matter (PM2.5)	24 Hour	35 $\mu g/m^3$	--
	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
Lead	30-day	--	1.5 μg/m
	Quarter	1.5 μg/m	--
	3-month average	0.15 μg/m	--
Visibility reducing particles	8 Hour	--	0.23/km extinction coefficient. (10-mile visibility standard)
Sulfates	24 Hour	--	25 μg/m
Vinyl chloride	24 Hour	--	0.01 ppm
Hydrogen sulfide	24 Hour	--	0.03 ppm

[1] Source: USEPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table and
CARB: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

[2] ppm = parts per million of air, by volume; µg/m3 = micrograms per cubic meter; Annual = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter.

[3] Secondary standards

Several pollutants listed in Table 4 are not addressed in this analysis. Lead is not included because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.3 Attainment Status

The Clean Air Act requires states to prepare a State Implementation Plan (SIP) to ensure air quality meets the NAAQS. The California Air Resources Board (CARB) provides designations of attainment for air basins where AAQS are either met or exceeded. If the AAQS are met, the area is designated as being in "attainment", if the air pollutant concentrations exceed the AAQS, than the area is designated as being "nonattainment". If there is inadequate or inconclusive data to make a definitive attainment designation, the area is considered "unclassified."

National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

When a state submits a request to the EPA to re-designate a nonattainment area to attainment, the Clean Air Act (CAA) section 175A(a) requires that the state (or states, if the area is a multi-state area) submit a maintenance plan ensuring the area can maintain the air quality standard for which the area is to be re-designated for at least 10 years following the effective date of re-designation.

Table 5 lists the attainment status for the criteria pollutants in the South Coast Air Basin (SCAB).

Table 5
South Coast Air Basin Attainment Status[1]

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)[2]
Carbon monoxide	Attainment	Attainment (Maintenance)
Nitrogen dioxide	Attainment	Attainment (Maintenance)
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	Nonattainment (Partial)[3]

[1] Source: California Air Resources Board. http://www.arb.ca.gov/desig/adm/adm.htm
[2] 8-Hour Ozone.
[3] Partial Nonattainment designation – Los Angeles County portion of Basin only.

2.4 South Coast Air Quality Management District (SCAQMD)

The agency responsible for air pollution control for the South Coast Air Basin (SCAB) is the South Coast Air Quality Management District (SCAQMD). SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the SCAB. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the SCAB. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air SCAB where one or more ambient air quality standards are exceeded.

The latest version is the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air. While air quality has dramatically improved over the years, the SCAB still exceeds federal public health standards for both ozone and particulate matter (PM) and experiences some of the worst air pollution in the nation. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time.

According to the 2016 AQMP, the most significant air quality challenge in the SCAB is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total

SCAB NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions (“baseline emissions”). The analysis suggests that total SCAB emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[2]

2.4.1 SCAQMD Rules and Regulations

The SCAQMD establishes a program of rules and regulations to obtain attainment of the state and federal standards in conjunction with the AQMP. Several of the rules and regulations that may be applicable to this project include, but are not limited to, the following:

- **SCAQMD Rule 402** prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

- **SCAQMD Rule 403** governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

- **SCAQMD Rule 445** restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

- **SCAQMD Rule 1113** governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and

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[2] SCAQMD. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

solvents used during construction and operation of project must comply with Rule 1113.

- **SCAQMD Rule 1143** governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

- **SCAQMD Rule 1186** limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

2.5 Local Climate and Meteorology

The project is located in the South Coast Air Basin (SCAB). Climatological data from the nearest weather station to the project site is summarized in Table 6.

Table 6
Climate Summary[1]

Month	Temperature (˚F)			Mean Precipitation (inches)
	Max.	Min.	Mean	
January	67.1	45.6	56.3	2.63
February	67.2	47.3	57.2	2.90
March	68.4	49.7	59.1	1.83
April	71.7	52.4	62.0	0.70
May	73.5	56.8	65.2	0.20
June	76.9	60.3	68.6	0.06
July	82.2	63.7	73.0	0.02
August	83.9	64.9	74.4	0.06
September	82.3	62.9	72.6	0.19
October	77.9	57.9	67.9	0.42
November	72.2	50.5	61.3	1.21
December	67.0	45.3	56.1	1.80
Annual	**74.2**	**54.8**	**64.5**	**12.01**

[1] Source: Western Regional Climate Center. Averages derived from measurements recorded from 1958 to 2012 at Long Beach (WSCMO) Daugherty Field, Station No. 045085.

2.6 Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2016 Air Quality Management Plan, prepared by SCAQMD, March 2017, indicate that collectively, mobile sources account for 60 percent of the VOC, 90 percent of the NOx emissions, 95 percent of the CO emissions and 34 percent of directly emitted PM2.5, with another 13 percent of PM2.5 from road dust.

The SCAQMD has divided the SCAB into fourteen general forecasting areas and thirty eight Source Receptor Areas (SRA) for monitoring and reporting local air quality. The SCAQMD provides daily reports of the current air quality conditions in each general forecast area and SRA. The monitoring areas provide a general representation of the local meteorological, terrain, and air quality conditions within the SCAB.

Table 7 summarizes the published air quality monitoring for the most recent 3-year period available. These pollutant levels were used to comprise a “background” for the project location and existing local air quality. For criteria pollutants not monitored near the site, data from the nearest monitoring station with a comparable setting were used.

Table 7
Local Air Quality

Air Pollutant Location	Averaging Time	Item	2017	2018	2019
Carbon Monoxide -- South Coastal LA County	1 Hour	Max 1-Hour (ppm)	3.9	4.7	3.0
		Exceeded State Standard (20 ppm)	No	No	No
		Exceeded National Standard (35 ppm)	No	No	No
	8 Hour	Max 8 Hour (ppm)	2.6	2.1	2.1
		Exceeded State Standard (9 ppm)	No	No	No
		Exceeded National Standard (9 ppm)	No	No	No
Ozone -- South Coastal LA County	1 Hour	Max 1-Hour (ppm)	0.082	0.074	0.074
		Days > State Standard (0.09 ppm)	0	0	0
	8 Hour	Max 8 Hour (ppm)	0.068	0.063	0.064
		Days > State Standard (0.07 ppm)	0	0	0
		Days >National Standard (0.07 ppm)	0	0	0
Nitrogen Dioxide -- South Coastal LA County	1 Hour	Max 1-Hour (ppm)	0.0895	0.0853	0.0718
		Exceeded State Standard (0.18 ppm)	No	No	No
	Annual	Annual Average (ppm)	0.0179	0.0173	0.0162
		Exceeded >State Standard (0.030 ppm)	No	No	No
		Exceeded >National Standard (0.053 ppm)	No	No	No
Sulfur Dioxide -- South Coastal LA County	1 Hour	Max 1 Hour (ppm)	0.0197	0.0094	0.0089
		Exceed State Standard (0.25 ppm)	No	No	No
		Exceed National Standard (0.075 ppm)	No	No	No
Coarse Particles (PM10) -- South Coastal LA County	24 Hour	Max 24-Hour ($\mu g/m^3$)	70	55	72
		Days > State Standard (50 $\mu g/m^3$)	2	1	2
		Days >National Standard (150 $\mu g/m^3$)	0	0	0
	Annual	Annual Average ($\mu g/m^3$)	27.3	23.9	21.0
		Exceeded State Standard (20 $\mu g/m^3$)	Yes	Yes	Yes
Fine Particulates (PM2.5) -- South Coastal LA County	24 Hour	Max 24-Hour ($\mu g/m^3$)	56.3	47.10	30.60
		Days >National Standard (35 $\mu g/m^3$)	5	2	0
	Annual	Annual Average ($\mu g/m^3$)	11.02	11.15	9.22
		Exceeded State Standard (12 $\mu g/m^3$)	No	No	No
		Exceeded National Standard (15 $\mu g/m^3$)	No	No	No

Source: https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year

$\mu g/m^3$ = micrograms per cubic meter

ARB = California Air Resource Board

EPA= Environmental Protection Agency

ppm = part per million

(- -) = Data not provided

3.0 Global Climate Change Setting

Global climate change is the change in the average weather of the earth that is measured by such things as alterations in temperature, wind patterns, storms, and precipitation. Current data shows that the recent period of warming is occurring more rapidly than past geological events. The average global surface temperature has increased by approximately 1.4° Fahrenheit since the early 20th Century. 1.4° Fahrenheit may seem like a small change, but it's an unusual event in Earth's recent history, and as we are seeing, even small changes in temperature can cause enormous changes in the environment.

The planet’s climate record, preserved in tree rings, ice cores, and coral reefs, shows that the global average temperature has been stable over long periods of time. For example, at the end of the last ice age, when the Northeast United States was covered by more than 3,000 feet of ice, average global temperatures were only 5° to 9° Fahrenheit cooler than today. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Therefore, significant changes to the environment are expected in the near future.

The consequences of global climate change include more frequent and severe weather, worsening air pollution by increasing ground level ozone, higher rates of plant and animal extinction, more acidic and oxygen depleted oceans, strain on food and water resources, and threats to densely populated coastal and low lying areas from sea level rise.

The impacts of climate change are already visible in the Southwest United States. In California, the consequences of climate change include;

- A rise in sea levels resulting in the displacement of coastal businesses and residencies
- A reduction in the quality and supply of water from the Sierra snowpack
- Increased risk of large wildfires
- Exacerbation of air quality problems
- Reductions in the quality and quantity of agricultural products
- An increased temperature and extreme weather events
- A decrease in the health and productivity of California’s forests

3.1 Greenhouse Gases

GHGs comprise less than 0.1 percent of the total atmospheric composition, yet they play an essential role in influencing climate. Greenhouse gases include naturally occurring compounds such as carbon dioxide (CO_2), methane (CH_4), water vapor (H_2O), and nitrous oxide (N_2O), while others are synthetic. Man-made GHGs include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Different GHGs have different effects on the Earth's warming. GHGs differ from each other in their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere, also known as the "lifetime".

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases and allows policymakers to compare emissions reduction opportunities across sectors and gases.

Table 8 lists the 100-year GWP of GHGs from the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report (AR5).

Table 8
Global Warming Potential of Greenhouse Gases[1, 2]

Gas Name	Formula	Lifetime (years)	GWP
Carbon Dioxide	CO_2		1
Methane	CH_4	12	28
Nitrous Oxide	N_2O	114	265
Sulphur Hexafluoride	SF_6	3200	23,500
Nitrogen Trifluoride	NF_3	740	16,100
Hexafluoroethane (PFC-116)	C_2F_6	10,000	11,100
Octafluoropropane (PFC-218)	C_3F_8	2,600	8,900
Octafluorocyclobutane (PFC-318)	C_4F_8	3,200	9,540
Tetrafluoromethane (PFC-14)	CF_4	50,000	6,630
Hydrofluorocarbon 125	HFC-125	29	3,170
Hydrofluorocarbon 134a	HFC-134a	14	1,300
Hydrofluorocarbon 143a	HFC-143a	52	4,800
Hydrofluorocarbon 152a	HFC-152a	1	138
Hydrofluorocarbon 227ea	HFC-227ea	34	3,350
Hydrofluorocarbon 23	HFC-23	270	12,400
Hydrofluorocarbon 236fa	HFC-236fa	240	8,060
Hydrofluorocarbon 245fa	HFC-245fa	8	858
Hydrofluorocarbon 32	HFC-32	5	677
Hydrofluorocarbon 365mfc	HFC-365mfc	9	804
Hydrofluorocarbon 43-10mee	HFC-43-10mee	16	1,650

[1] Source: IPCC Fifth Assessment Report (AR5)
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf

[2] GWPs are used to convert GHG emission values to "carbon dioxide equivalent" (CO_2e) units

3.2 GHG Regulatory Setting – State of California

The State of California has been a leader in climate change legislation and has passed numerous bills to reduce greenhouse gas emissions across all sectors of the economy. Some of the key climate legislation in the State include the following:

- **Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006.** AB 32 set the stage for the State's transition to a sustainable, low-carbon future. AB 32 was the first program in the country to take a comprehensive, long-term approach to addressing climate change.[3]

- **Senate Bill (SB) 375, Sustainable Communities & Climate Protection Act of 2008.** SB 375 requires the Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles GHG reduction targets for 2020 and 2035 for each region covered by the State's 18 metropolitan planning organizations.[4]

- **Senate Bill (SB) 100, California Renewables Portfolio Standard Program.** SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.[5]

3.3 GHG Emissions Inventory

Table 9 shows the latest GHG emission inventories at the national, state, regional and local levels.

Table 9
GHG Emissions Inventory[1]

United States (2018)[2]	State of California (2018)[3]	SCAG (2020)[4]	City of Long Beach (2015)[5]
6,678 MMTCO$_2$e	425 MMTCO$_2$e	216.4 MMTCO$_2$e	2.799 MMTCO$_2$e

[1] MMTCO$_2$e = Million Metric Tons of Carbon Dioxide Equivalent
[2] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks
[3] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf
[4] http://www.scag.ca.gov/programs/Pages/GreenhouseGases.aspx
[5] City of Long Beach Climate Action + Adaptation Plan (Proposed). 2020.

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[3] California Air Resources Board. AB 32 Global Warming Solutions Act of 2006. https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006

[4] California Air Resources Board. Sustainable Communities and Climate Protection Program. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-climate-protection-program/about

[5] California Energy Commission. SB 100 Joint Agency Report. https://www.energy.ca.gov/sb100

4.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the construction and operation of the project. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria air pollutant and GHG emissions.

The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from off-site energy generation, solid waste disposal, vegetation planting and/or removal, and water use. The model also identifies mitigation measures to reduce criteria pollutant and GHG emissions. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts.

4.1 Construction Assumptions

Construction of the project is estimated to begin in the year 2021 and last approximately 14 months. Construction activities are expected to consist of site remediation, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2023. Construction phases are not expected to overlap.

The project site is currently vacant and no demolition is expected to be required.

During site remediation, a total of approximately 1,914 cubic yards of contaminated soil will be removed from the site and trucked to Arizona for disposal.

Earthwork for the project is expected to balance, hence no import or export of grading material is required.

Assumptions for off-road equipment usage, soil disturbance area, worker and vendor trips, paving, and architectural coatings utilize the CalEEMod defaults. The project will be required to comply with several standard fugitive dust control measures, per SCAQMD Rule 403. The following key inputs are utilized in CalEEMod and are based upon data provided from SCAQMD[6]:

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[6] SCAQMD. Fugitive Dust Mitigation Measures. http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

- Utilize soil stabilizers - 30% PM_{10} and $PM_{2.5}$ reduction.
- Replace ground cover - 15% PM_{10} and $PM_{2.5}$ reduction.
- Water exposed areas 2x per day.
- Unpaved road moisture content – 25%.
- Unpaved road vehicle speed – 15 mph.

4.2 Operational Assumptions

Operational emissions occur over the life of the project and are considered "long-term" sources of emissions. Operational emissions include both direct and indirect sources. This section briefly describes the operational sources of emissions analyzed for the project.

4.2.1 Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the project. Mobile sources are direct sources of project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site.

Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle).

The project trip generation is based on the latest version of the ITE Trip Generation Manual, 10th Edition and the *Atlantic 84-Townhomes Residential Project Traffic Study, April 2021, LLG* (Traffic Study*)*. The Traffic Study utilizes internal capture and non-auto trip reduction credits. For purposes of this study, the emissions analysis includes the internal capture credits taken in the Traffic Study, but does not include the non-auto trip adjustment to be conservative.

The Emission Factors (EMFAC) 2014 model is used to estimate the mobile source emissions are embedded in the CalEEMod emissions model. No adjustments have been made to default emission factors.

The project's total vehicle miles traveled estimated by CalEEMod is shown in the Table 10 for this project.

Table 10
Operational Vehicle Miles Traveled

Land Use	Annual Vehicle Miles Traveled (VMT)[1]
Multifamily Housing (Mid-Rise)	1,396,248
High Turnover Restaurant	286,210
Total	**1,682,458**

[1] Unmitigated VMT.

The operational vehicle fleet mix has been adjusted to reflect vehicle types used for typical residential home-based trips and the commercial/retail trips generated by the project. The Southern California Association of Governments (SCAG) regional travel demand model does not include heavy-duty trucks, buses or other large vehicles that would require passenger car equivalent (PCE) adjustments for residential home-based trips. The project does not consist of land uses that would typically require PCE adjustments to account for large trucks, such as warehousing.

To be conservative, the Air Quality/GHG analysis has assumed that 2% of the total residential home-based trips and commercial/retail and office trips will include trucks with a gross vehicle weight rating (GVWR) of 10,000 pound or greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The 2% mix is also consistent with the default Highway Capacity Manual (HCM) assumptions. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

Table 11 summarizes vehicle mix used for this project.

Table 11
Vehicle Mix for Trips[1]

YUY	Vehicle Mix (%)
Light Duty Automobile (LDA)	57.17%
Light Duty Truck (LDTI)	4.69%
Light Duty Truck (LDT2)	21.50%
Medium Duty Truck (MDV)	12.50%
Light Heavy Truck (LHD1)	1.61%
Light Heavy Truck (LHD2)	0.19%
Medium Heavy Truck (MHD)	0.64%
Heavy Heavy Truck (HHD)	0.98%
Other Bus (OBUS)	0.08%
Urban Bus (UBUS)	0.07%
Motorcycle (MCY)	0.54%
School Bus (SBUS)	0.02%
Motor Home (MH)	0.03%
Total	**100.0%**

[1] Adjusted fleet mix to include 2% total trucks over 10,000 lbs GVWR. (LHD2, MHD, HHD, OBUS, UBUS, SBUS, MH)

4.2.2 Energy Source Emissions

Energy usage includes both direct and indirect sources of emissions. Direct sources of emissions include on-site natural gas usage (non-hearth) for heating, while indirect emissions include electricity generated by offsite power plants. Natural gas use is measured in units of a thousand British Thermal Units (kBTU) per size metric for each land use subtype and electricity use is measured in kilowatt hours (kWh) per size metric for each land use subtype.

CalEEMod divides building electricity and natural gas use into uses that are subject to Title 24 standards and those that are not. Lighting electricity usage is also calculated as a separate category in CalEEMod. For electricity, Title 24 uses include the major building envelope systems covered by Part 6 (California Energy Code) of Title 24, such as space heating, space cooling, water heating, and ventilation. Non-Title 24 uses include all other end uses, such as appliances, electronics, and other miscellaneous plug-in uses. Because some lighting is not considered as part of the building envelope energy budget, and since a separate mitigation measure is applicable to this end use, CalEEMod makes lighting a separate category.

For natural gas, uses are likewise categorized as Title 24 or Non-Title 24. Title 24 uses include building heating and hot water end uses. Non-Title 24 natural gas uses include cooking and appliances (including pool/spa heaters).

The baseline values are based on the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies.

The project will be required to provide on-site renewable energy photovoltaic installations (solar panels), as required by the latest 2019 CA Energy Code requirements. The Energy Code requires all new residential construction to achieve net-zero emissions associated with electricity usage through the use of on-site renewable sources. This analysis is conservative and does not account for emissions reductions from renewable energy.

Table 12 shows the total annual expected electricity and natural gas usage for the proposed project.

Table 12
Electricity and Natural Gas Usage

Land Use	Electricity Usage[1] (KWhr/yr)[2]	Natural Gas Usage[1] (KBTU/yr)[2]
Multifamily Housing (Mid-Rise)	323,345	1,097,590
High Turnover Restaurant	86,540	460,660
Parking Lot	23,252	--
Total	**433,137**	**1,558,250**

[1] CalEEMod unmitigated default estimates.

[2] KWhr/yr = Kilowatt Hours per Year
KBTU/yr = Thousand British Thermal Units per Year

4.2.3 Area Source Emissions

Area source emissions are direct sources of emissions that fall under four categories; hearths, consumer products, architectural coatings, and landscaping equipment.
Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore, no wood hearths are included in this project.

Consumer products are various solvents used in non-industrial applications which emit ROGs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries.

4.2.4 Other Sources of Operational Emissions

Water. Greenhouse gas emissions are generated from the upstream energy required to supply and treat the water used on the project site. Indirect emissions from water usage are counted as part of the project's overall impact. The estimated water usage for the project is reported in Table 13.

Waste. CalEEMod calculates the indirect GHG emissions associated with waste that is disposed of at a landfill. The program uses annual waste disposal rates from the California Department of Resources Recycling and Recovery (CalRecycle) data for individual land uses. The program quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon.

The estimated waste generation by the project is reported in Table 13.

Table 13
Water Usage and Waste Generation

Land Use	Water Usage (gallons/year)			Waste Generation (tons/year)[1]
	Indoor	Outdoor	Total	
Multifamily Housing (Mid-Rise)	5,472,940	3,450,330	8,923,270	38.64
High Turnover Restaurant	607,067	38,749	645,816	23.8
Total	**6,080,007**	**3,489,079**	**9,569,086**	**62.44**

[1] CalEEMod unmitigated default estimates.

5.0 Significance Thresholds

5.1 Air Quality Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the project is presumed to be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 14 lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 14
SCAQMD Air Quality Significance Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550

[1] Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

5.2 GHG Significance Thresholds

SCAQMD has developed recommended GHG thresholds of significance to assist local agencies with determining the impact of a project for CEQA. SCAQMD's objective in providing the GHG guidelines is to establish a performance standard that will ultimately contribute to reducing GHG emissions below 1990 levels, and thus achieve the requirements of the California Global Warming Solutions Act (AB 32).

SCAQMD first issued the *Interim CEQA Greenhouse Gas (GHG) Significance Thresholds* guidance document in October 2008, and has since help several stakeholder working group meetings where staff has presented updated recommendations that serve in addendum to the interim document. The latest recommended GHG thresholds are based on the GHG CEQA Significance Threshold Stakeholder Working Group #15, September 2010.

The SCAQMD describes a five-tiered approach for determining GHG Significance Thresholds.

- **Tier 1 -** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2 -** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment based on the following tiers.

- **Tier 3 -** Consists of screening values that are intended to capture 90 percent of the GHG emissions from projects. If a project's emissions are under the screening thresholds, then the project is less than significant. SCAQMD has presented two options that lead agencies could choose for screening values. Option #1 sets the thresholds for residential projects to 3,500 $MTCO_2e$/year, commercial projects to 1,400 $MTCO_2e$/year), and the mixed use to 3,000 $MTCO_2e$/year. Option #2 sets a single numerical threshold for all non-industrial projects of 3,000 $MTCO_2e$/year. The current staff recommendation is to use option #2, but allows lead agencies to choose option #1 if they prefer. Regardless of which option a lead agency chooses to follow, it is recommended that the same option is consistently used for all projects.

Table 15 shows the screening levels described in option #2, which has been used previously in the City of Long Beach.

Table 15
SCAQMD Tier 3 GHG Screening Values

Land Use	Screening Value
Industrial Projects	10,000 $MTCO_2e$/Yr
Residential/Commercial Projects	3,000 $MTCO_2e$/Yr

- **Tier 4 -** includes performance standards compliance options to demonstrate that a project is not significant for GHG emissions.

  Compliance Option 3 consists of staffs currently proposed Tier 4 performance standards for establishing efficiency-based standards at the plan level (program-level projects such as general plans and specific plans) and project level. Efficiency standards are based on the amount of GHG emissions ($MTCO_2e$/year) per Service Population (SP). SP is defined as the sum of the residential and employment populations provided by a project.

  Table 16 shows the SCAQMD recommended GHG efficiency thresholds.

Table 16
SCAQMD Tier 4 GHG Efficiency Thresholds

Project Type	Efficiency Thresholds[1]	
	Target Year 2020	Target Year 2035
Plan/Program Level	6.6 $MTCO_2e$/yr/SP	4.1 $MTCO_2e$/yr/SP
Project Level	4.8 $MTCO_2e$/yr/SP	3.0 $MTCO_2e$/yr/SP

- **Tier 5 –** involves implementing off-site mitigation or the purchasing of offsets to reduce GHG emissions to less than the proposed screening level. The project proponent would be required to provide offsets for the life of the project, which is defined as 30 years.

By complying with the SCAQMD GHG thresholds of significance, the project is considered to be in compliance with the applicable State GHG legislation.

6.0 Air Quality Impact Analysis

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality would occur if the proposed project is determined to:

a) Conflict with or obstruct implementation of the applicable air quality plan.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

6.1 Short Term Air Quality Impacts During Construction

6.1.1 Daily Air Quality Emissions - Construction

Daily air quality emissions include both on-site and off-site emissions associated with construction of the project. Daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance.

As shown in Table 17, daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions reports are provided in Appendix A.

Table 17
Daily Air Quality Emissions - Construction

Maximum Daily Emissions (lbs/day)[1, 2]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Site Remediation	1.78	47.34	13.45	0.16	5.30	1.90
Site Preparation	3.24	33.13	20.41	0.04	9.33	5.40
Grading	2.00	20.90	15.86	0.03	3.82	2.22
Building Construction	2.07	16.88	20.21	0.04	1.95	1.08
Paving	1.27	9.58	12.98	0.02	0.71	0.51
Architectural Coating	31.51	1.35	2.46	0.00	0.27	0.13
Maximum[1]	**31.51**	**33.13**	**20.41**	**0.04**	**9.33**	**5.40**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Includes standard fugitive dust control measures.

The project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and built into the design features.

Table 17 shows that, the project's daily construction emissions will be below the applicable SCAQMD air quality standards and thresholds of significance.

As a result, the project would not conflict with or obstruct implementation of the SCAQMD air quality plan during construction.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

6.1.2 Fugitive Dust - Construction

The Project is required to comply with several rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

Prior to the issuance of grading and building permits, the project shall prepare and submit a Construction Management Plan to the City of Long Beach that demonstrates the ability to implement the fugitive dust control and construction emissions reductions measures described in this report.

The project will be required to follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

- All active and exposed construction areas shall be watered two (2) times daily.
- Speed on unpaved roads shall be reduced to less than 15 mph.
- Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
- Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
- All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
- Access points shall be washed or swept daily.
- Construction sites shall be sandbagged for erosion control.
- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).

- Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
- Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
- Replace the ground cover of disturbed areas as quickly possible.

6.1.3 Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. No other sources of objectionable odors have been identified for the proposed Project.

The construction of the project is not expected to result in odor emissions that would adversely affect a substantial number of people.

6.1.4 Asbestos - Construction

Asbestos is a carcinogen and is categorized as a hazardous air pollutant by the Environmental Protection Agency (EPA) and regulated through the National Emissions Standards for Hazardous Air Pollutants (NESHAP). SCAQMD is the local enforcement authority for asbestos. Asbestos fibers imbedded within construction materials become a health hazard once they are disturbed and rendered airborne, such as through physical contact like building renovation and demolition activities.

The project is not expected to require the demolition of existing building or structures. Therefore, the potential risk from exposure to asbestos during construction is small.

Asbestos also occurs naturally in serpentine and ultramafic rock. Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk from naturally occurring asbestos (NOA) during project construction is also small.

In the event asbestos is found on the site, the project will be required to comply with SCAQMD and NESHAP standards and protocols. SCAQMD Rule 1403 establishes the survey requirements, notification, and work practice requirements to prevent asbestos emissions during construction activities. By following the required asbestos abatement protocols, the project impact from asbestos would be less than significant.

6.1.5 Diesel Particulate Matter - Construction

The greatest potential for toxic air contaminant emissions from the project would be related to diesel particulate matter (DPM) emissions associated with heavy diesel equipment used during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

The proposed project's construction activity is not expected to be a long-term (i.e., 30 years) source of toxic air contaminant emissions, thus the individual cancer risk is greatly reduced. However, a quantified diesel health risk assessment (HRA) has not been prepared as part of the scope of this analysis.

Given the close proximity of the project to adjacent sensitive receptors, the project will incorporate project design features to help ensure the potential health risk associated with DPM during construction is reduced to the maximum extent feasible. This includes the use of Tier 4 engines on all diesel powered construction equipment. Tier 4 engines, along with the latest national fuel standards, have been shown to yield PM reductions of over 95% from the typical Tier 2 and Tier 3 engines[7].

It is presumed that with the recommended project design features and Tier 4 engines in place that the potential short term construction health risks will be less than significant.

The following design features are expected to be provided to help ensure the project does not expose receptors to substantial pollution concentrations during construction:

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[7] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

- All construction equipment will have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.
- Construction equipment will be maintained in proper tune.
- All construction vehicles will be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.
- The simultaneous operation of multiple construction equipment units will be minimized, to the maximum extent feasible.
- The use of heavy construction equipment and earthmoving activity will be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.
- An electricity supply to the construction site will be provided and electric powered equipment or generators will be used, instead of diesel, where feasible.
- Staging areas for the construction equipment will be set back as far from adjacent residential homes, as feasible.
- Haul trucks with on-road engines will be used for on-site hauling.

6.2 Long Term Air Quality Impacts - Operation

6.2.1 Daily Air Quality Emissions - Operation

Daily air quality emissions from project operations are generated through mobile, energy and area sources and calculated using the methodology described in Section 4.2 of this report. Daily emissions are compared to the SCAQMD thresholds of significance.

As shown in Table 18, daily operational emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions reports are provided in Appendix A.

Table 18
Daily Air Quality Emissions - Operations

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	1.22	1.63	14.26	0.04	3.86	1.04
Energy Sources	0.05	0.40	0.22	0.00	0.03	0.03
Area Sources	2.23	1.26	7.44	0.01	0.13	0.13
Total	**3.49**	**3.30**	**21.92**	**0.05**	**4.03**	**1.21**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

6.2.2 Odors - Operation

Land uses that commonly receive odor complaints include agricultural uses (farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The proposed project does not contain land uses that would typically be associated with significant odor emissions.

The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Project related odors are not expected to meet the criteria of being a nuisance.

6.2.3 Toxic Air Contaminants - Operations

The project would consist of residential and commercial/restaurant land uses. These types of land uses do not typically generate major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. No additional analysis of operational TACs is recommended for this project.

7.0 Greenhouse Gas Impact Analysis

Consistent with CEQA Guidelines, a significant impact related to greenhouse gas would occur if the proposed project is determined to:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.

7.1 Greenhouse Gas Emissions - Construction

Greenhouse gas emissions are estimated for on-site and off-site construction activity using CalEEMod. Table 19 shows the construction greenhouse gas emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are amortized over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations.

CalEEMod unmitigated annual GHG output calculations are provided in Appendix C and mitigated annual GHG reports are provided in Appendix D.

Table 19
Construction Greenhouse Gas Emissions

Activity	Emissions ($MTC0_2e$)[1]
2021	80.56
2022	443.06
2023	4.66
Total	528.28
Amortized over 30 years[2]	**17.61**

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents (includes carbon dioxide, methane, nitrous oxide, and/or hydrofluorocarbon).
[2] The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions and GHG emissions reduction measures for construction equipment are relatively limited.

Therefore, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions.[8] In doing so, construction GHG emissions are included in the overall contribution of the project, as further discussed in the following section.

7.2 Greenhouse Gas Emissions - Operation

Greenhouse gas emissions are estimated for on-site and off-site operational activity using CalEEMod. Greenhouse gas emissions from mobile sources, area sources and energy sources are shown in Table 20. CalEEMod annual GHG output calculations are provided in Appendix B.

The analysis compares the Project's GHG emissions to the SCAQMD Tier 3 threshold, which limits GHG emissions to 3,000 MTCO2e per year. Project GHG emissions will be below the SCAQMD recommended threshold of significance for residential and commercial projects. Thus, project related long-term GHG impacts would be potentially significant. Therefore, the project would not significantly generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Table 20
Operational Greenhouse Gas Emissions

Emission Source	GHG Emissions ($MTCO_2e/yr$)[1]
Area Source	18.70
Energy Source	160.86
Mobile Source	570.11
Waste	31.40
Water	29.30
Construction (amortized over 30 years)	17.61
Total Annual Emissions	**827.98**
SCAQMD Tier 3 GHG Threshold	3,000 MTCO2e/year
Exceed Threshold?	No

[1] $MTCO_2e/yr$ = metric tons of carbon dioxide equivalents per year

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[8] SCAQMD. Interim CEQA GHG Significance Thresholds. Page 3-10. 2008

7.3 Project Consistency With GHG Reduction Plans

The project will be required to comply with the mandatory requirements of the latest 2019 California Building Standards Code, including Title 24, Part 11, CALGreen and Title 24, Part 6, Energy Code. The purpose of the building standards is to reduce negative impacts on the environment through improved planning and design, energy efficiency, water efficiency and conservation and material and resource conservation. The California Building Standards were developed to help meet the requirements of the Global Warming Solutions Act (AB 32).

As part of the latest Energy Code requirements, the project will be required to include rooftop solar panels, community solar panels, and/or other sources of on-site renewable energy capable of meeting the required California Energy Code Energy Design Rating. Therefore, by complying with the City's GHG reduction policy the project would not conflict with an applicable plan, policy, or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

The City of Long Beach is also currently in the process of adopting a Climate Action and Adaptation Plan (CAAP). Although the final approved CAAP has not yet been adopted, the proposed plan has been released for public review.[9]

The project will also be consist with several of the Mitigation Objectives and Actions from the proposed CAAP by providing increased use of solar power (BE-2), increasing employment and residential development along primary transit corridors (T-6), increase the density and mixing of land uses (T-8), and ensure compliance with state law requirements for multifamily and commercial property recycling programs (W-1).

As a result, the project would not conflict with an applicable plan, policy, or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

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[9] Long Beach Climate Action and Adaptation Plan. November 2020 (Proposed). https://www.longbeach.gov/lbds/planning/caap/#:~:text=The%20CAAP%20will%20help%20to,economic%20vitality%20in%20Long%20Beach. Accessed May 2021.

Exhibits

Exhibit A
Location Map

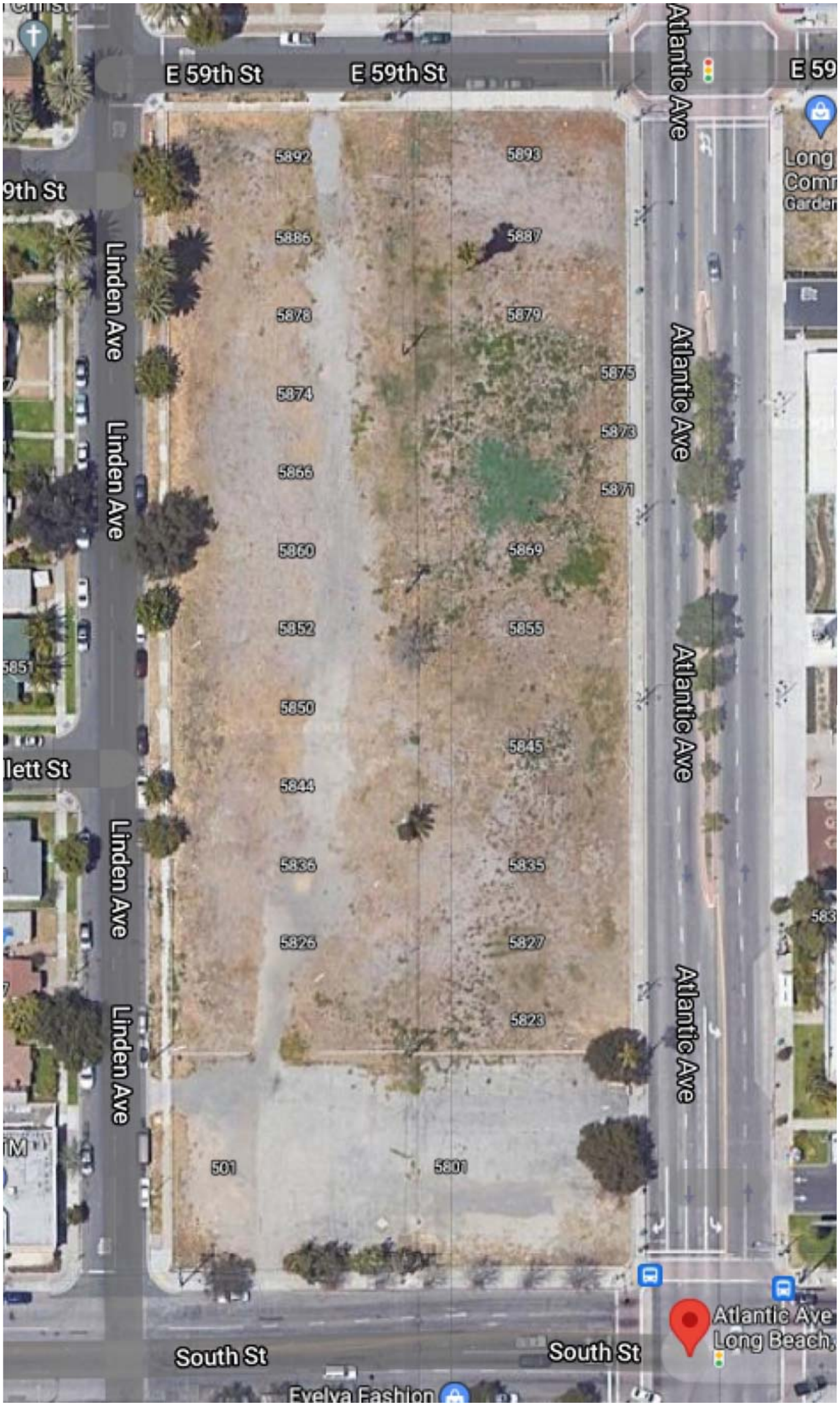
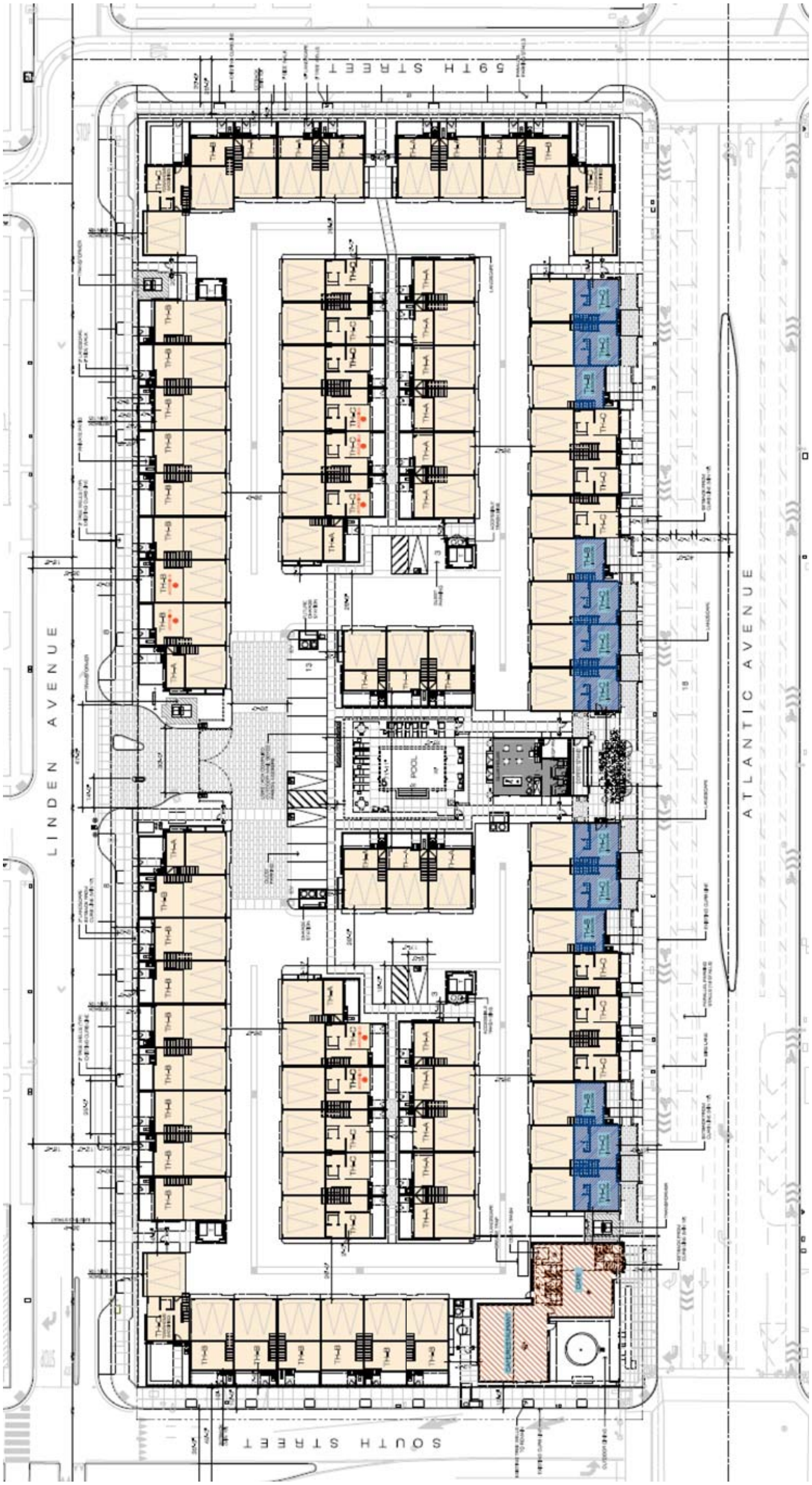


Exhibit B
Site Plan



N

Appendices

Appendix A

CalEEMod Daily Emissions Reports
(Summer & Winter)

Atlantic Avenue Mixed Use Project AQ & GHG Study - Unmitigated

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	66.43	1000sqft	1.53	66,433.00	0
High Turnover (Sit Down Restaurant)	2.00	1000sqft	0.05	2,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	1.62	84,000.00	240

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project consists of 84 Multifamily Mid Rise Apartments and 2,000 sq ft of High Turnover Restuarant on approximately 3.2 acres of site.

Construction Phase - Project requires site remediation with a total of approximately 1,914 cubic yards of Cal Haz profiled dirt will be removed from the site and trucked to Arizona for disposal.

Off-road Equipment - 1 loader and 1 excavator expected to be used for site remediation.

Trips and VMT - Cal Haz dirt to be hauled to Arizona (for analysis purposes, hauling distance tracked to CA/AZ border). Aprox. 106 truckloads are estimated.

On-road Fugitive Dust -

Grading - 1,914 cubic yards of material export during site remediation.

Vehicle Trips - The project trip generation rates are based on TRAFFIC STUDY ATLANTIC 84-TOWNHOMES RESIDENTIAL PROJECT, April 20, 2021, by LL&G.

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	10.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	4.20	0.00
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	0.03
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.0830e-003	1.9380e-003
tblFleetMix	LHD2	6.0830e-003	1.9380e-003

tblFleetMix	LHD2	6.0830e-003	6.2270e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.1840e-003
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	8.6200e-004
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	2.5460e-003
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	6.9200e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	2.1330e-003
tblGrading	MaterialExported	0.00	1,914.00
tblLandUse	LandUseSquareFeet	66,430.00	66,433.00
tblLandUse	LotAcreage	2.21	1.62
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	226.00
tblTripsAndVMT	HaulingTripNumber	0.00	212.00
tblVehicleTrips	WD_TR	5.44	5.01

tblVehicleTrips	WD_TR	112.18	94.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.7771	45.7162	13.4522	0.1561	5.0613	0.7407	5.8020	1.2519	0.7007	1.9526	0.0000	16,972.5256	16,972.5256	1.1203	2.5576	17,762.7031
2022	3.2324	33.1290	20.4072	0.0400	19.8582	1.6139	21.4721	10.1558	1.4848	11.6406	0.0000	3,900.9699	3,900.9699	1.1972	0.0829	3,941.9586
2023	31.5062	8.8350	12.9152	0.0209	0.2236	0.4370	0.6606	0.0593	0.4038	0.4630	0.0000	2,007.9530	2,007.9530	0.5723	4.6200e-003	2,023.6364
Maximum	**31.5062**	**45.7162**	**20.4072**	**0.1561**	**19.8582**	**1.6139**	**21.4721**	**10.1558**	**1.4848**	**11.6406**	**0.0000**	**16,972.5256**	**16,972.5256**	**1.1972**	**2.5576**	**17,762.7031**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.7771	45.7162	13.4522	0.1561	4.5568	0.7407	5.2975	1.1968	0.7007	1.8976	0.0000	16,972.5256	16,972.5256	1.1203	2.5576	17,762.7031
2022	3.2324	33.1290	20.4072	0.0400	7.7200	1.6139	9.3339	3.9176	1.4848	5.4023	0.0000	3,900.9699	3,900.9699	1.1972	0.0829	3,941.9586
2023	31.5062	8.8350	12.9152	0.0209	0.2236	0.4370	0.6606	0.0593	0.4038	0.4630	0.0000	2,007.9530	2,007.9530	0.5723	4.6200e-003	2,023.6364
Maximum	**31.5062**	**45.7162**	**20.4072**	**0.1561**	**7.7200**	**1.6139**	**9.3339**	**3.9176**	**1.4848**	**5.4023**	**0.0000**	**16,972.5256**	**16,972.5256**	**1.1972**	**2.5576**	**17,762.7031**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**50.28**	**0.00**	**45.26**	**54.88**	**0.00**	**44.77**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Energy	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
Mobile	1.2190	1.5128	14.2564	0.0372	3.8355	0.0260	3.8615	1.0198	0.0241	1.0439		3,835.7753	3,835.7753	0.1918	0.1456	3,883.9556
Total	**3.4936**	**3.1780**	**21.9209**	**0.0477**	**3.8355**	**0.1920**	**4.0275**	**1.0198**	**0.1901**	**1.2099**	**0.0000**	**5,862.5261**	**5,862.5261**	**0.2424**	**0.1825**	**5,922.9770**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Energy	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
Mobile	1.2190	1.5128	14.2564	0.0372	3.8355	0.0260	3.8615	1.0198	0.0241	1.0439		3,835.7753	3,835.7753	0.1918	0.1456	3,883.9556
Total	**3.4936**	**3.1780**	**21.9209**	**0.0477**	**3.8355**	**0.1920**	**4.0275**	**1.0198**	**0.1901**	**1.2099**	**0.0000**	**5,862.5261**	**5,862.5261**	**0.2424**	**0.1825**	**5,922.9770**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Remediation	Site Preparation	12/1/2021	12/14/2021	5	10	
2	Site Preparation	Site Preparation	1/3/2022	1/7/2022	5	5	
3	Grading	Grading	1/8/2022	1/19/2022	5	8	
4	Building Construction	Building Construction	1/20/2022	12/7/2022	5	230	
5	Paving	Paving	12/8/2022	1/2/2023	5	18	
6	Architectural Coating	Architectural Coating	1/3/2023	1/26/2023	5	18	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.53

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 3,000; Non-Residential Outdoor: 1,000; Striped Parking Area: 3,986 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40

Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Site Remediation	Excavators	1	8.00	158	0.38
Site Remediation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	89.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Remediation	2	5.00	0.00	212.00	14.70	6.90	226.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Remediation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8170	0.0000	0.8170	0.0892	0.0000	0.0892			0.0000			0.0000
Off-Road	0.4165	4.0492	5.5321	8.2700e-003		0.2162	0.2162		0.1989	0.1989		801.0920	801.0920	0.2591		807.5693
Total	**0.4165**	**4.0492**	**5.5321**	**8.2700e-003**	**0.8170**	**0.2162**	**1.0332**	**0.0892**	**0.1989**	**0.2881**		**801.0920**	**801.0920**	**0.2591**		**807.5693**

3.2 Site Remediation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.3418	41.6526	7.7044	0.1473	4.1884	0.5242	4.7125	1.1479	0.5015	1.6494		16,117.9692	16,117.9692	0.8596	2.5563	16,901.2237
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0188	0.0144	0.2157	5.3000e-004	0.0559	3.8000e-004	0.0563	0.0148	3.5000e-004	0.0152		53.4644	53.4644	1.5800e-003	1.3600e-003	53.9101
Total	**1.3606**	**41.6669**	**7.9201**	**0.1479**	**4.2443**	**0.5245**	**4.7688**	**1.1627**	**0.5018**	**1.6646**		**16,171.4336**	**16,171.4336**	**0.8612**	**2.5576**	**16,955.1338**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3125	0.0000	0.3125	0.0341	0.0000	0.0341			0.0000			0.0000
Off-Road	0.4165	4.0492	5.5321	8.2700e-003		0.2162	0.2162		0.1989	0.1989	0.0000	801.0920	801.0920	0.2591		807.5693
Total	**0.4165**	**4.0492**	**5.5321**	**8.2700e-003**	**0.3125**	**0.2162**	**0.5287**	**0.0341**	**0.1989**	**0.2330**	**0.0000**	**801.0920**	**801.0920**	**0.2591**		**807.5693**

3.2 Site Remediation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	1.3418	41.6526	7.7044	0.1473	4.1884	0.5242	4.7125	1.1479	0.5015	1.6494		16,117.9692	16,117.9692	0.8596	2.5563	16,901.2237
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0188	0.0144	0.2157	5.3000e-004	0.0559	3.8000e-004	0.0563	0.0148	3.5000e-004	0.0152		53.4644	53.4644	1.5800e-003	1.3600e-003	53.9101
Total	**1.3606**	**41.6669**	**7.9201**	**0.1479**	**4.2443**	**0.5245**	**4.7688**	**1.1627**	**0.5018**	**1.6646**		**16,171.4336**	**16,171.4336**	**0.8612**	**2.5576**	**16,955.1338**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0455	0.7094	1.8400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0546		187.2229	187.2229	5.0700e-003	4.5000e-003	188.6918
Total	**0.0623**	**0.0455**	**0.7094**	**1.8400e-003**	**0.2012**	**1.2900e-003**	**0.2025**	**0.0534**	**1.1900e-003**	**0.0546**		**187.2229**	**187.2229**	**5.0700e-003**	**4.5000e-003**	**188.6918**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**7.5188**	**1.6126**	**9.1314**	**3.8642**	**1.4836**	**5.3478**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0455	0.7094	1.8400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0546		187.2229	187.2229	5.0700e-003	4.5000e-003	188.6918
Total	**0.0623**	**0.0455**	**0.7094**	**1.8400e-003**	**0.2012**	**1.2900e-003**	**0.2025**	**0.0534**	**1.1900e-003**	**0.0546**		**187.2229**	**187.2229**	**5.0700e-003**	**4.5000e-003**	**188.6918**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.0826**	**0.9409**	**8.0234**	**3.4247**	**0.8656**	**4.2903**		**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0519	0.0379	0.5912	1.5300e-003	0.1677	1.0700e-003	0.1687	0.0445	9.9000e-004	0.0455		156.0191	156.0191	4.2200e-003	3.7500e-003	157.2432
Total	**0.0519**	**0.0379**	**0.5912**	**1.5300e-003**	**0.1677**	**1.0700e-003**	**0.1687**	**0.0445**	**9.9000e-004**	**0.0455**		**156.0191**	**156.0191**	**4.2200e-003**	**3.7500e-003**	**157.2432**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7091	0.0000	2.7091	1.3100	0.0000	1.3100			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**2.7091**	**0.9409**	**3.6499**	**1.3100**	**0.8656**	**2.1755**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0519	0.0379	0.5912	1.5300e-003	0.1677	1.0700e-003	0.1687	0.0445	9.9000e-004	0.0455		156.0191	156.0191	4.2200e-003	3.7500e-003	157.2432
Total	**0.0519**	**0.0379**	**0.5912**	**1.5300e-003**	**0.1677**	**1.0700e-003**	**0.1687**	**0.0445**	**9.9000e-004**	**0.0455**		**156.0191**	**156.0191**	**4.2200e-003**	**3.7500e-003**	**157.2432**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0394	0.9797	0.3359	3.9200e-003	0.1281	9.3300e-003	0.1374	0.0369	8.9300e-003	0.0458		420.9232	420.9232	0.0141	0.0607	439.3503
Worker	0.3080	0.2249	3.5078	9.1000e-003	0.9948	6.3800e-003	1.0012	0.2638	5.8700e-003	0.2697		925.7131	925.7131	0.0251	0.0223	932.9761
Total	**0.3474**	**1.2046**	**3.8437**	**0.0130**	**1.1229**	**0.0157**	**1.1386**	**0.3007**	**0.0148**	**0.3155**		**1,346.6363**	**1,346.6363**	**0.0391**	**0.0829**	**1,372.3264**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0394	0.9797	0.3359	3.9200e-003	0.1281	9.3300e-003	0.1374	0.0369	8.9300e-003	0.0458		420.9232	420.9232	0.0141	0.0607	439.3503
Worker	0.3080	0.2249	3.5078	9.1000e-003	0.9948	6.3800e-003	1.0012	0.2638	5.8700e-003	0.2697		925.7131	925.7131	0.0251	0.0223	932.9761
Total	**0.3474**	**1.2046**	**3.8437**	**0.0130**	**1.1229**	**0.0157**	**1.1386**	**0.3007**	**0.0148**	**0.3155**		**1,346.636 3**	**1,346.636 3**	**0.0391**	**0.0829**	**1,372.326 4**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.129 7	1,805.129 7	0.5672		1,819.309 1
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1992**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.129 7**	**1,805.129 7**	**0.5672**		**1,819.309 1**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0692	0.0505	0.7883	2.0400e-003	0.2236	1.4300e-003	0.2250	0.0593	1.3200e-003	0.0606		208.0254	208.0254	5.6300e-003	5.0000e-003	209.6576
Total	**0.0692**	**0.0505**	**0.7883**	**2.0400e-003**	**0.2236**	**1.4300e-003**	**0.2250**	**0.0593**	**1.3200e-003**	**0.0606**		**208.0254**	**208.0254**	**5.6300e-003**	**5.0000e-003**	**209.6576**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504	0.0000	1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1992**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**	**0.0000**	**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0692	0.0505	0.7883	2.0400e-003	0.2236	1.4300e-003	0.2250	0.0593	1.3200e-003	0.0606		208.0254	208.0254	5.6300e-003	5.0000e-003	209.6576
Total	**0.0692**	**0.0505**	**0.7883**	**2.0400e-003**	**0.2236**	**1.4300e-003**	**0.2250**	**0.0593**	**1.3200e-003**	**0.0606**		**208.0254**	**208.0254**	**5.6300e-003**	**5.0000e-003**	**209.6576**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025		1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1408**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**		**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0640	0.0447	0.7248	1.9800e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2400e-003	0.0605		202.5226	202.5226	5.0400e-003	4.6200e-003	204.0242
Total	**0.0640**	**0.0447**	**0.7248**	**1.9800e-003**	**0.2236**	**1.3500e-003**	**0.2249**	**0.0593**	**1.2400e-003**	**0.0605**		**202.5226**	**202.5226**	**5.0400e-003**	**4.6200e-003**	**204.0242**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025	0.0000	1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1408**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**	**0.0000**	**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0640	0.0447	0.7248	1.9800e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2400e-003	0.0605		202.5226	202.5226	5.0400e-003	4.6200e-003	204.0242
Total	**0.0640**	**0.0447**	**0.7248**	**1.9800e-003**	**0.2236**	**1.3500e-003**	**0.2249**	**0.0593**	**1.2400e-003**	**0.0605**		**202.5226**	**202.5226**	**5.0400e-003**	**4.6200e-003**	**204.0242**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.2569					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**31.4486**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0576	0.0402	0.6523	1.7800e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1200e-003	0.0545		182.2703	182.2703	4.5400e-003	4.1500e-003	183.6218
Total	**0.0576**	**0.0402**	**0.6523**	**1.7800e-003**	**0.2012**	**1.2100e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**182.2703**	**182.2703**	**4.5400e-003**	**4.1500e-003**	**183.6218**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.2569					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**31.4486**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0576	0.0402	0.6523	1.7800e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1200e-003	0.0545		182.2703	182.2703	4.5400e-003	4.1500e-003	183.6218
Total	**0.0576**	**0.0402**	**0.6523**	**1.7800e-003**	**0.2012**	**1.2100e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**182.2703**	**182.2703**	**4.5400e-003**	**4.1500e-003**	**183.6218**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.2190	1.5128	14.2564	0.0372	3.8355	0.0260	3.8615	1.0198	0.0241	1.0439		3,835.7753	3,835.7753	0.1918	0.1456	3,883.9556
Unmitigated	1.2190	1.5128	14.2564	0.0372	3.8355	0.0260	3.8615	1.0198	0.0241	1.0439		3,835.7753	3,835.7753	0.1918	0.1456	3,883.9556

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	420.84	412.44	343.56	1,396,248	1,396,248
High Turnover (Sit Down Restaurant)	188.00	244.80	285.28	286,210	286,210
Parking Lot	0.00	0.00	0.00		
Total	608.84	657.24	628.84	1,682,458	1,682,458

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
High Turnover (Sit Down	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268
High Turnover (Sit Down Restaurant)	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268

Parking Lot	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
NaturalGas Unmitigated	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3007.11	0.0324	0.2771	0.1179	1.7700e-003		0.0224	0.0224		0.0224	0.0224		353.7771	353.7771	6.7800e-003	6.4900e-003	355.8795
High Turnover (Sit Down Restaurant)	1262.08	0.0136	0.1237	0.1039	7.4000e-004		9.4000e-003	9.4000e-003		9.4000e-003	9.4000e-003		148.4803	148.4803	2.8500e-003	2.7200e-003	149.3626
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0460**	**0.4009**	**0.2219**	**2.5100e-003**		**0.0318**	**0.0318**		**0.0318**	**0.0318**		**502.2574**	**502.2574**	**9.6300e-003**	**9.2100e-003**	**505.2421**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3.00711	0.0324	0.2771	0.1179	1.7700e-003		0.0224	0.0224		0.0224	0.0224		353.7771	353.7771	6.7800e-003	6.4900e-003	355.8795
High Turnover (Sit Down Restaurant)	1.26208	0.0136	0.1237	0.1039	7.4000e-004		9.4000e-003	9.4000e-003		9.4000e-003	9.4000e-003		148.4803	148.4803	2.8500e-003	2.7200e-003	149.3626
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0460**	**0.4009**	**0.2219**	**2.5100e-003**		**0.0318**	**0.0318**		**0.0318**	**0.0318**		**502.2574**	**502.2574**	**9.6300e-003**	**9.2100e-003**	**505.2421**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Unmitigated	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1541					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7263					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1386	1.1844	0.5040	7.5600e-003		0.0958	0.0958		0.0958	0.0958	0.0000	1,512.0000	1,512.0000	0.0290	0.0277	1,520.9851
Landscaping	0.2095	0.0800	6.9386	3.7000e-004		0.0384	0.0384		0.0384	0.0384		12.4934	12.4934	0.0120		12.7943
Total	**2.2285**	**1.2644**	**7.4426**	**7.9300e-003**		**0.1342**	**0.1342**		**0.1342**	**0.1342**	**0.0000**	**1,524.4934**	**1,524.4934**	**0.0410**	**0.0277**	**1,533.7794**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1541					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7263					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1386	1.1844	0.5040	7.5600e-003		0.0958	0.0958		0.0958	0.0958	0.0000	1,512.0000	1,512.0000	0.0290	0.0277	1,520.9851
Landscaping	0.2095	0.0800	6.9386	3.7000e-004		0.0384	0.0384		0.0384	0.0384		12.4934	12.4934	0.0120		12.7943
Total	**2.2285**	**1.2644**	**7.4426**	**7.9300e-003**		**0.1342**	**0.1342**		**0.1342**	**0.1342**	**0.0000**	**1,524.4934**	**1,524.4934**	**0.0410**	**0.0277**	**1,533.7794**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Atlantic Avenue Mixed Use Project AQ & GHG Study - Unmitigated

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	66.43	1000sqft	1.53	66,433.00	0
High Turnover (Sit Down Restaurant)	2.00	1000sqft	0.05	2,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	1.62	84,000.00	240

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project consists of 84 Multifamily Mid Rise Apartments and 2,000 sq ft of High Turnover Restuarant on approximately 3.2 acres of site.

Construction Phase - Project requires site remediation with a total of approximately 1,914 cubic yards of Cal Haz profiled dirt will be removed from the site and trucked to Arizona for disposal.

Off-road Equipment - 1 loader and 1 excavator expected to be used for site remediation.

Trips and VMT - Cal Haz dirt to be hauled to Arizona (for analysis purposes, hauling distance tracked to CA/AZ border). Aprox. 106 truckloads are estimated.

On-road Fugitive Dust -

Grading - 1,914 cubic yards of material export during site remediation.

Vehicle Trips - The project trip generation rates are based on TRAFFIC STUDY ATLANTIC 84-TOWNHOMES RESIDENTIAL PROJECT, April 20, 2021, by LL&G.

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	10.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	4.20	0.00
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	0.03
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.0830e-003	1.9380e-003
tblFleetMix	LHD2	6.0830e-003	1.9380e-003

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	6.0830e-003	6.2270e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.1840e-003
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	8.6200e-004
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	2.5460e-003
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	6.9200e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	2.1330e-003
tblGrading	MaterialExported	0.00	1,914.00
tblLandUse	LandUseSquareFeet	66,430.00	66,433.00
tblLandUse	LotAcreage	2.21	1.62
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	226.00
tblTripsAndVMT	HaulingTripNumber	0.00	212.00
tblVehicleTrips	WD_TR	5.44	5.01

tblVehicleTrips	WD_TR	112.18	94.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.7761	47.3382	13.4412	0.1561	5.0613	0.7408	5.8021	1.2519	0.7008	1.9527	0.0000	16,969.8405	16,969.8405	1.1201	2.5578	17,760.0806
2022	3.2368	33.1338	20.3491	0.0398	19.8582	1.6139	21.4721	10.1558	1.4848	11.6406	0.0000	3,863.3858	3,863.3858	1.1973	0.0845	3,894.7520
2023	31.5105	8.8396	12.8566	0.0208	0.2236	0.4370	0.6606	0.0593	0.4038	0.4630	0.0000	1,997.2757	1,997.2757	0.5724	4.9300e-003	2,013.0547
Maximum	**31.5105**	**47.3382**	**20.3491**	**0.1561**	**19.8582**	**1.6139**	**21.4721**	**10.1558**	**1.4848**	**11.6406**	**0.0000**	**16,969.8405**	**16,969.8405**	**1.1973**	**2.5578**	**17,760.0806**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.7761	47.3382	13.4412	0.1561	4.5568	0.7408	5.2976	1.1968	0.7008	1.8976	0.0000	16,969.8405	16,969.8405	1.1201	2.5578	17,760.0806
2022	3.2368	33.1338	20.3491	0.0398	7.7200	1.6139	9.3339	3.9176	1.4848	5.4023	0.0000	3,863.3858	3,863.3858	1.1973	0.0845	3,894.7520
2023	31.5105	8.8396	12.8566	0.0208	0.2236	0.4370	0.6606	0.0593	0.4038	0.4630	0.0000	1,997.2757	1,997.2757	0.5724	4.9300e-003	2,013.0547
Maximum	**31.5105**	**47.3382**	**20.3491**	**0.1561**	**7.7200**	**1.6139**	**9.3339**	**3.9176**	**1.4848**	**5.4023**	**0.0000**	**16,969.8405**	**16,969.8405**	**1.1973**	**2.5578**	**17,760.0806**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	50.28	0.00	45.26	54.88	0.00	44.77	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Energy	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
Mobile	1.1807	1.6330	13.7810	0.0355	3.8355	0.0261	3.8615	1.0198	0.0241	1.0439		3,663.0701	3,663.0701	0.1991	0.1522	3,713.4125
Total	**3.4552**	**3.2983**	**21.4455**	**0.0460**	**3.8355**	**0.1920**	**4.0275**	**1.0198**	**0.1901**	**1.2099**	**0.0000**	**5,689.8209**	**5,689.8209**	**0.2497**	**0.1892**	**5,752.4340**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Energy	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
Mobile	1.1807	1.6330	13.7810	0.0355	3.8355	0.0261	3.8615	1.0198	0.0241	1.0439		3,663.0701	3,663.0701	0.1991	0.1522	3,713.4125
Total	**3.4552**	**3.2983**	**21.4455**	**0.0460**	**3.8355**	**0.1920**	**4.0275**	**1.0198**	**0.1901**	**1.2099**	**0.0000**	**5,689.8209**	**5,689.8209**	**0.2497**	**0.1892**	**5,752.4340**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Remediation	Site Preparation	12/1/2021	12/14/2021	5	10	
2	Site Preparation	Site Preparation	1/3/2022	1/7/2022	5	5	
3	Grading	Grading	1/8/2022	1/19/2022	5	8	
4	Building Construction	Building Construction	1/20/2022	12/7/2022	5	230	
5	Paving	Paving	12/8/2022	1/2/2023	5	18	
6	Architectural Coating	Architectural Coating	1/3/2023	1/26/2023	5	18	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.53

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 3,000; Non-Residential Outdoor: 1,000; Striped Parking Area: 3,986 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40

Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Site Remediation	Excavators	1	8.00	158	0.38
Site Remediation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	89.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Remediation	2	5.00	0.00	212.00	14.70	6.90	226.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Remediation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8170	0.0000	0.8170	0.0892	0.0000	0.0892			0.0000			0.0000
Off-Road	0.4165	4.0492	5.5321	8.2700e-003		0.2162	0.2162		0.1989	0.1989		801.0920	801.0920	0.2591		807.5693
Total	**0.4165**	**4.0492**	**5.5321**	**8.2700e-003**	**0.8170**	**0.2162**	**1.0332**	**0.0892**	**0.1989**	**0.2881**		**801.0920**	**801.0920**	**0.2591**		**807.5693**

3.2 Site Remediation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.3396	43.2731	7.7114	0.1473	4.1884	0.5242	4.7126	1.1479	0.5015	1.6495		16,118.1197	16,118.1197	0.8595	2.5564	16,901.4084
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0200	0.0159	0.1978	5.0000e-004	0.0559	3.8000e-004	0.0563	0.0148	3.5000e-004	0.0152		50.6288	50.6288	1.5900e-003	1.4600e-003	51.1030
Total	**1.3597**	**43.2889**	**7.9092**	**0.1478**	**4.2443**	**0.5246**	**4.7689**	**1.1627**	**0.5019**	**1.6646**		**16,168.7485**	**16,168.7485**	**0.8610**	**2.5578**	**16,952.5113**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3125	0.0000	0.3125	0.0341	0.0000	0.0341			0.0000			0.0000
Off-Road	0.4165	4.0492	5.5321	8.2700e-003		0.2162	0.2162		0.1989	0.1989	0.0000	801.0920	801.0920	0.2591		807.5693
Total	**0.4165**	**4.0492**	**5.5321**	**8.2700e-003**	**0.3125**	**0.2162**	**0.5287**	**0.0341**	**0.1989**	**0.2330**	**0.0000**	**801.0920**	**801.0920**	**0.2591**		**807.5693**

3.2 Site Remediation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.3396	43.2731	7.7114	0.1473	4.1884	0.5242	4.7126	1.1479	0.5015	1.6495		16,118.1197	16,118.1197	0.8595	2.5564	16,901.4084
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0200	0.0159	0.1978	5.0000e-004	0.0559	3.8000e-004	0.0563	0.0148	3.5000e-004	0.0152		50.6288	50.6288	1.5900e-003	1.4600e-003	51.1030
Total	**1.3597**	**43.2889**	**7.9092**	**0.1478**	**4.2443**	**0.5246**	**4.7689**	**1.1627**	**0.5019**	**1.6646**		**16,168.7485**	**16,168.7485**	**0.8610**	**2.5578**	**16,952.5113**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0667	0.0503	0.6514	1.7400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0546		177.3240	177.3240	5.1300e-003	4.8100e-003	178.8864
Total	**0.0667**	**0.0503**	**0.6514**	**1.7400e-003**	**0.2012**	**1.2900e-003**	**0.2025**	**0.0534**	**1.1900e-003**	**0.0546**		**177.3240**	**177.3240**	**5.1300e-003**	**4.8100e-003**	**178.8864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**7.5188**	**1.6126**	**9.1314**	**3.8642**	**1.4836**	**5.3478**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0667	0.0503	0.6514	1.7400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0546		177.3240	177.3240	5.1300e-003	4.8100e-003	178.8864
Total	**0.0667**	**0.0503**	**0.6514**	**1.7400e-003**	**0.2012**	**1.2900e-003**	**0.2025**	**0.0534**	**1.1900e-003**	**0.0546**		**177.3240**	**177.3240**	**5.1300e-003**	**4.8100e-003**	**178.8864**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.0826**	**0.9409**	**8.0234**	**3.4247**	**0.8656**	**4.2903**		**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0556	0.0419	0.5428	1.4500e-003	0.1677	1.0700e-003	0.1687	0.0445	9.9000e-004	0.0455		147.7700	147.7700	4.2700e-003	4.0100e-003	149.0720
Total	**0.0556**	**0.0419**	**0.5428**	**1.4500e-003**	**0.1677**	**1.0700e-003**	**0.1687**	**0.0445**	**9.9000e-004**	**0.0455**		**147.7700**	**147.7700**	**4.2700e-003**	**4.0100e-003**	**149.0720**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7091	0.0000	2.7091	1.3100	0.0000	1.3100			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**2.7091**	**0.9409**	**3.6499**	**1.3100**	**0.8656**	**2.1755**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0556	0.0419	0.5428	1.4500e-003	0.1677	1.0700e-003	0.1687	0.0445	9.9000e-004	0.0455		147.7700	147.7700	4.2700e-003	4.0100e-003	149.0720
Total	**0.0556**	**0.0419**	**0.5428**	**1.4500e-003**	**0.1677**	**1.0700e-003**	**0.1687**	**0.0445**	**9.9000e-004**	**0.0455**		**147.7700**	**147.7700**	**4.2700e-003**	**4.0100e-003**	**149.0720**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.0201	0.3475	3.9200e-003	0.1281	9.3700e-003	0.1375	0.0369	8.9600e-003	0.0459		421.0813	421.0813	0.0140	0.0607	439.5306
Worker	0.3298	0.2485	3.2207	8.6200e-003	0.9948	6.3800e-003	1.0012	0.2638	5.8700e-003	0.2697		876.7685	876.7685	0.0254	0.0238	884.4940
Total	**0.3686**	**1.2686**	**3.5682**	**0.0125**	**1.1229**	**0.0158**	**1.1387**	**0.3007**	**0.0148**	**0.3156**		**1,297.8499**	**1,297.8499**	**0.0394**	**0.0845**	**1,324.0245**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.0201	0.3475	3.9200e-003	0.1281	9.3700e-003	0.1375	0.0369	8.9600e-003	0.0459		421.0813	421.0813	0.0140	0.0607	439.5306
Worker	0.3298	0.2485	3.2207	8.6200e-003	0.9948	6.3800e-003	1.0012	0.2638	5.8700e-003	0.2697		876.7685	876.7685	0.0254	0.0238	884.4940
Total	**0.3686**	**1.2686**	**3.5682**	**0.0125**	**1.1229**	**0.0158**	**1.1387**	**0.3007**	**0.0148**	**0.3156**		**1,297.8499**	**1,297.8499**	**0.0394**	**0.0845**	**1,324.0245**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1992**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0741	0.0558	0.7237	1.9400e-003	0.2236	1.4300e-003	0.2250	0.0593	1.3200e-003	0.0606		197.0266	197.0266	5.7000e-003	5.3500e-003	198.7627
Total	**0.0741**	**0.0558**	**0.7237**	**1.9400e-003**	**0.2236**	**1.4300e-003**	**0.2250**	**0.0593**	**1.3200e-003**	**0.0606**		**197.0266**	**197.0266**	**5.7000e-003**	**5.3500e-003**	**198.7627**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504	0.0000	1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1992**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**	**0.0000**	**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0741	0.0558	0.7237	1.9400e-003	0.2236	1.4300e-003	0.2250	0.0593	1.3200e-003	0.0606		197.0266	197.0266	5.7000e-003	5.3500e-003	198.7627
Total	**0.0741**	**0.0558**	**0.7237**	**1.9400e-003**	**0.2236**	**1.4300e-003**	**0.2250**	**0.0593**	**1.3200e-003**	**0.0606**		**197.0266**	**197.0266**	**5.7000e-003**	**5.3500e-003**	**198.7627**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025		1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1408**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**		**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0688	0.0493	0.6662	1.8700e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2400e-003	0.0605		191.8453	191.8453	5.1100e-003	4.9300e-003	193.4424
Total	**0.0688**	**0.0493**	**0.6662**	**1.8700e-003**	**0.2236**	**1.3500e-003**	**0.2249**	**0.0593**	**1.2400e-003**	**0.0605**		**191.8453**	**191.8453**	**5.1100e-003**	**4.9300e-003**	**193.4424**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025	0.0000	1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.2227					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1408**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**	**0.0000**	**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0688	0.0493	0.6662	1.8700e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2400e-003	0.0605		191.8453	191.8453	5.1100e-003	4.9300e-003	193.4424
Total	**0.0688**	**0.0493**	**0.6662**	**1.8700e-003**	**0.2236**	**1.3500e-003**	**0.2249**	**0.0593**	**1.2400e-003**	**0.0605**		**191.8453**	**191.8453**	**5.1100e-003**	**4.9300e-003**	**193.4424**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.2569					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**31.4486**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0619	0.0444	0.5996	1.6900e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1200e-003	0.0545		172.6608	172.6608	4.6000e-003	4.4400e-003	174.0982
Total	**0.0619**	**0.0444**	**0.5996**	**1.6900e-003**	**0.2012**	**1.2100e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**172.6608**	**172.6608**	**4.6000e-003**	**4.4400e-003**	**174.0982**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	31.2569					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**31.4486**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0619	0.0444	0.5996	1.6900e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1200e-003	0.0545		172.6608	172.6608	4.6000e-003	4.4400e-003	174.0982
Total	**0.0619**	**0.0444**	**0.5996**	**1.6900e-003**	**0.2012**	**1.2100e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**172.6608**	**172.6608**	**4.6000e-003**	**4.4400e-003**	**174.0982**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1807	1.6330	13.7810	0.0355	3.8355	0.0261	3.8615	1.0198	0.0241	1.0439		3,663.0701	3,663.0701	0.1991	0.1522	3,713.4125
Unmitigated	1.1807	1.6330	13.7810	0.0355	3.8355	0.0261	3.8615	1.0198	0.0241	1.0439		3,663.0701	3,663.0701	0.1991	0.1522	3,713.4125

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	420.84	412.44	343.56	1,396,248	1,396,248
High Turnover (Sit Down Restaurant)	188.00	244.80	285.28	286,210	286,210
Parking Lot	0.00	0.00	0.00		
Total	608.84	657.24	628.84	1,682,458	1,682,458

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
High Turnover (Sit Down	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268
High Turnover (Sit Down Restaurant)	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268

Parking Lot	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421
NaturalGas Unmitigated	0.0460	0.4009	0.2219	2.5100e-003		0.0318	0.0318		0.0318	0.0318		502.2574	502.2574	9.6300e-003	9.2100e-003	505.2421

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3007.11	0.0324	0.2771	0.1179	1.7700e-003		0.0224	0.0224		0.0224	0.0224		353.7771	353.7771	6.7800e-003	6.4900e-003	355.8795
High Turnover (Sit Down Restaurant)	1262.08	0.0136	0.1237	0.1039	7.4000e-004		9.4000e-003	9.4000e-003		9.4000e-003	9.4000e-003		148.4803	148.4803	2.8500e-003	2.7200e-003	149.3626
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0460**	**0.4009**	**0.2219**	**2.5100e-003**		**0.0318**	**0.0318**		**0.0318**	**0.0318**		**502.2574**	**502.2574**	**9.6300e-003**	**9.2100e-003**	**505.2421**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3.00711	0.0324	0.2771	0.1179	1.7700e-003		0.0224	0.0224		0.0224	0.0224		353.7771	353.7771	6.7800e-003	6.4900e-003	355.8795
High Turnover (Sit Down Restaurant)	1.26208	0.0136	0.1237	0.1039	7.4000e-004		9.4000e-003	9.4000e-003		9.4000e-003	9.4000e-003		148.4803	148.4803	2.8500e-003	2.7200e-003	149.3626
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0460**	**0.4009**	**0.2219**	**2.5100e-003**		**0.0318**	**0.0318**		**0.0318**	**0.0318**		**502.2574**	**502.2574**	**9.6300e-003**	**9.2100e-003**	**505.2421**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794
Unmitigated	2.2286	1.2644	7.4426	7.9300e-003		0.1342	0.1342		0.1342	0.1342	0.0000	1,524.4934	1,524.4934	0.0410	0.0277	1,533.7794

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1541					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7263					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1386	1.1844	0.5040	7.5600e-003		0.0958	0.0958		0.0958	0.0958	0.0000	1,512.0000	1,512.0000	0.0290	0.0277	1,520.9851
Landscaping	0.2095	0.0800	6.9386	3.7000e-004		0.0384	0.0384		0.0384	0.0384		12.4934	12.4934	0.0120		12.7943
Total	**2.2285**	**1.2644**	**7.4426**	**7.9300e-003**		**0.1342**	**0.1342**		**0.1342**	**0.1342**	**0.0000**	**1,524.4934**	**1,524.4934**	**0.0410**	**0.0277**	**1,533.7794**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1541					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7263					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1386	1.1844	0.5040	7.5600e-003		0.0958	0.0958		0.0958	0.0958	0.0000	1,512.0000	1,512.0000	0.0290	0.0277	1,520.9851
Landscaping	0.2095	0.0800	6.9386	3.7000e-004		0.0384	0.0384		0.0384	0.0384		12.4934	12.4934	0.0120		12.7943
Total	**2.2285**	**1.2644**	**7.4426**	**7.9300e-003**		**0.1342**	**0.1342**		**0.1342**	**0.1342**	**0.0000**	**1,524.4934**	**1,524.4934**	**0.0410**	**0.0277**	**1,533.7794**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

CalEEMod Annual Emissions Reports

Atlantic Avenue Mixed Use Project AQ & GHG Study - Unmitigated

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	66.43	1000sqft	1.53	66,433.00	0
High Turnover (Sit Down Restaurant)	2.00	1000sqft	0.05	2,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	1.62	84,000.00	240

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project consists of 84 Multifamily Mid Rise Apartments and 2,000 sq ft of High Turnover Restuarant on approximately 3.2 acres of site.

Construction Phase - Project requires site remediation with a total of approximately 1,914 cubic yards of Cal Haz profiled dirt will be removed from the site and trucked to Arizona for disposal.

Off-road Equipment - 1 loader and 1 excavator expected to be used for site remediation.

Trips and VMT - Cal Haz dirt to be hauled to Arizona (for analysis purposes, hauling distance tracked to CA/AZ border). Aprox. 106 truckloads are estimated.

On-road Fugitive Dust -

Grading - 1,914 cubic yards of material export during site remediation.

Vehicle Trips - The project trip generation rates are based on TRAFFIC STUDY ATLANTIC 84-TOWNHOMES RESIDENTIAL PROJECT, April 20, 2021, by LL&G.

Woodstoves - Per SCAQMD rule 445, no wood burning devices are allowed in new developments.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	10.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	4.20	0.00
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	9.7530e-003
tblFleetMix	HHD	8.0120e-003	0.03
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.05
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LDT2	0.19	0.21
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.0830e-003	1.9380e-003
tblFleetMix	LHD2	6.0830e-003	1.9380e-003

tblFleetMix	LHD2	6.0830e-003	6.2270e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.4290e-003
tblFleetMix	MCY	0.02	5.1840e-003
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MDV	0.13	0.12
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	2.6800e-004
tblFleetMix	MH	3.3740e-003	8.6200e-004
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	6.3690e-003
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	7.9200e-004
tblFleetMix	OBUS	9.2500e-004	2.5460e-003
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	2.1500e-004
tblFleetMix	SBUS	6.9800e-004	6.9200e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	6.6400e-004
tblFleetMix	UBUS	6.1100e-004	2.1330e-003
tblGrading	MaterialExported	0.00	1,914.00
tblLandUse	LandUseSquareFeet	66,430.00	66,433.00
tblLandUse	LotAcreage	2.21	1.62
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	226.00
tblTripsAndVMT	HaulingTripNumber	0.00	212.00
tblVehicleTrips	WD_TR	5.44	5.01

tblVehicleTrips	WD_TR	112.18	94.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	8.8800e-003	0.2404	0.0672	7.8000e-004	0.0249	3.7000e-003	0.0287	6.1700e-003	3.5000e-003	9.6700e-003	0.0000	76.9769	76.9769	5.0800e-003	0.0116	80.5615
2022	0.2626	2.1911	2.5252	4.9600e-003	0.2071	0.1068	0.3139	0.0737	0.1003	0.1740	0.0000	438.4387	438.4387	0.0785	8.9200e-003	443.0599
2023	0.2842	0.0166	0.0283	5.0000e-005	1.8800e-003	8.7000e-004	2.7500e-003	5.0000e-004	8.5000e-004	1.3500e-003	0.0000	4.6359	4.6359	4.3000e-004	4.0000e-005	4.6584
Maximum	**0.2842**	**2.1911**	**2.5252**	**4.9600e-003**	**0.2071**	**0.1068**	**0.3139**	**0.0737**	**0.1003**	**0.1740**	**0.0000**	**438.4387**	**438.4387**	**0.0785**	**0.0116**	**443.0599**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	8.8800e-003	0.2404	0.0672	7.8000e-004	0.0224	3.7000e-003	0.0261	5.8900e-003	3.5000e-003	9.4000e-003	0.0000	76.9769	76.9769	5.0800e-003	0.0116	80.5614
2022	0.2626	2.1911	2.5252	4.9600e-003	0.1593	0.1068	0.2661	0.0497	0.1003	0.1499	0.0000	438.4383	438.4383	0.0785	8.9200e-003	443.0596
2023	0.2842	0.0166	0.0283	5.0000e-005	1.8800e-003	8.7000e-004	2.7500e-003	5.0000e-004	8.5000e-004	1.3500e-003	0.0000	4.6359	4.6359	4.3000e-004	4.0000e-005	4.6584
Maximum	**0.2842**	**2.1911**	**2.5252**	**4.9600e-003**	**0.1593**	**0.1068**	**0.2661**	**0.0497**	**0.1003**	**0.1499**	**0.0000**	**438.4383**	**438.4383**	**0.0785**	**0.0116**	**443.0596**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**21.53**	**0.00**	**14.59**	**30.27**	**0.00**	**13.15**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-3-2022**	**4-2-2022**	0.6573	0.6573
2	**4-3-2022**	**7-2-2022**	0.6134	0.6134
3	**7-3-2022**	**10-2-2022**	0.6202	0.6202
4	**10-3-2022**	**1-2-2023**	0.5471	0.5471
5	**1-3-2023**	**4-2-2023**	0.2816	0.2816
		Highest	0.6573	0.6573

2.2 Overall Operational

<u>Unmitigated Operational</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3711	0.0248	0.8736	1.4000e-004		6.0000e-003	6.0000e-003		6.0000e-003	6.0000e-003	0.0000	18.5625	18.5625	1.6900e-003	3.1000e-004	18.6985
Energy	8.4000e-003	0.0732	0.0405	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003	0.0000	159.9693	159.9693	8.0800e-003	2.3100e-003	160.8597
Mobile	0.1873	0.2726	2.3085	6.0100e-003	0.6303	4.3400e-003	0.6346	0.1678	4.0200e-003	0.1719	0.0000	562.5438	562.5438	0.0295	0.0229	570.1109
Waste						0.0000	0.0000		0.0000	0.0000	12.6748	0.0000	12.6748	0.7491	0.0000	31.4012
Water						0.0000	0.0000		0.0000	0.0000	1.9289	20.9146	22.8435	0.1999	4.8900e-003	29.2984
Total	**0.5668**	**0.3706**	**3.2226**	**6.6100e-003**	**0.6303**	**0.0162**	**0.6465**	**0.1678**	**0.0158**	**0.1837**	**14.6037**	**761.9901**	**776.5938**	**0.9882**	**0.0304**	**810.3686**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3711	0.0248	0.8736	1.4000e-004		6.0000e-003	6.0000e-003		6.0000e-003	6.0000e-003	0.0000	18.5625	18.5625	1.6900e-003	3.1000e-004	18.6985
Energy	8.4000e-003	0.0732	0.0405	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003	0.0000	159.9693	159.9693	8.0800e-003	2.3100e-003	160.8597
Mobile	0.1873	0.2726	2.3085	6.0100e-003	0.6303	4.3400e-003	0.6346	0.1678	4.0200e-003	0.1719	0.0000	562.5438	562.5438	0.0295	0.0229	570.1109
Waste						0.0000	0.0000		0.0000	0.0000	12.6748	0.0000	12.6748	0.7491	0.0000	31.4012
Water						0.0000	0.0000		0.0000	0.0000	1.9289	20.9146	22.8435	0.1999	4.8900e-003	29.2984
Total	**0.5668**	**0.3706**	**3.2226**	**6.6100e-003**	**0.6303**	**0.0162**	**0.6465**	**0.1678**	**0.0158**	**0.1837**	**14.6037**	**761.9901**	**776.5938**	**0.9882**	**0.0304**	**810.3686**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Remediation	Site Preparation	12/1/2021	12/14/2021	5	10	
2	Site Preparation	Site Preparation	1/3/2022	1/7/2022	5	5	
3	Grading	Grading	1/8/2022	1/19/2022	5	8	

4	Building Construction	Building Construction	1/20/2022	12/7/2022	5	230	
5	Paving	Paving	12/8/2022	1/2/2023	5	18	
6	Architectural Coating	Architectural Coating	1/3/2023	1/26/2023	5	18	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.53

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 3,000; Non-Residential Outdoor: 1,000; Striped Parking Area: 3,986 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Site Remediation	Excavators		1	8.00	158	0.38
Site Remediation	Tractors/Loaders/Backhoes		1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	89.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Remediation	2	5.00	0.00	212.00	14.70	6.90	226.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Remediation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0900e-003	0.0000	4.0900e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0203	0.0277	4.0000e-005		1.0800e-003	1.0800e-003		9.9000e-004	9.9000e-004	0.0000	3.6337	3.6337	1.1800e-003	0.0000	3.6631
Total	**2.0800e-003**	**0.0203**	**0.0277**	**4.0000e-005**	**4.0900e-003**	**1.0800e-003**	**5.1700e-003**	**4.5000e-004**	**9.9000e-004**	**1.4400e-003**	**0.0000**	**3.6337**	**3.6337**	**1.1800e-003**	**0.0000**	**3.6631**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-003	0.2200	0.0385	7.4000e-004	0.0206	2.6200e-003	0.0232	5.6500e-003	2.5100e-003	8.1600e-003	0.0000	73.1101	73.1101	3.9000e-003	0.0116	76.6631
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	8.0000e-005	1.0100e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2331	0.2331	1.0000e-005	1.0000e-005	0.2353
Total	**6.7900e-003**	**0.2201**	**0.0395**	**7.4000e-004**	**0.0209**	**2.6200e-003**	**0.0235**	**5.7200e-003**	**2.5100e-003**	**8.2300e-003**	**0.0000**	**73.3432**	**73.3432**	**3.9100e-003**	**0.0116**	**76.8984**

3.2 Site Remediation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5600e-003	0.0000	1.5600e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0203	0.0277	4.0000e-005		1.0800e-003	1.0800e-003		9.9000e-004	9.9000e-004	0.0000	3.6337	3.6337	1.1800e-003	0.0000	3.6631
Total	**2.0800e-003**	**0.0203**	**0.0277**	**4.0000e-005**	**1.5600e-003**	**1.0800e-003**	**2.6400e-003**	**1.7000e-004**	**9.9000e-004**	**1.1600e-003**	**0.0000**	**3.6337**	**3.6337**	**1.1800e-003**	**0.0000**	**3.6631**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-003	0.2200	0.0385	7.4000e-004	0.0206	2.6200e-003	0.0232	5.6500e-003	2.5100e-003	8.1600e-003	0.0000	73.1101	73.1101	3.9000e-003	0.0116	76.6631
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	8.0000e-005	1.0100e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2331	0.2331	1.0000e-005	1.0000e-005	0.2353
Total	**6.7900e-003**	**0.2201**	**0.0395**	**7.4000e-004**	**0.0209**	**2.6200e-003**	**0.0235**	**5.7200e-003**	**2.5100e-003**	**8.2300e-003**	**0.0000**	**73.3432**	**73.3432**	**3.9100e-003**	**0.0116**	**76.8984**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0491	0.0000	0.0491	0.0253	0.0000	0.0253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9300e-003	0.0827	0.0492	1.0000e-004		4.0300e-003	4.0300e-003		3.7100e-003	3.7100e-003	0.0000	8.3599	8.3599	2.7000e-003	0.0000	8.4274
Total	**7.9300e-003**	**0.0827**	**0.0492**	**1.0000e-004**	**0.0491**	**4.0300e-003**	**0.0532**	**0.0253**	**3.7100e-003**	**0.0290**	**0.0000**	**8.3599**	**8.3599**	**2.7000e-003**	**0.0000**	**8.4274**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.3000e-004	1.6700e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4082	0.4082	1.0000e-005	1.0000e-005	0.4118
Total	**1.5000e-004**	**1.3000e-004**	**1.6700e-003**	**0.0000**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4082**	**0.4082**	**1.0000e-005**	**1.0000e-005**	**0.4118**

3.3 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0188	0.0000	0.0188	9.6600e-003	0.0000	9.6600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9300e-003	0.0827	0.0492	1.0000e-004		4.0300e-003	4.0300e-003		3.7100e-003	3.7100e-003	0.0000	8.3598	8.3598	2.7000e-003	0.0000	8.4274
Total	**7.9300e-003**	**0.0827**	**0.0492**	**1.0000e-004**	**0.0188**	**4.0300e-003**	**0.0228**	**9.6600e-003**	**3.7100e-003**	**0.0134**	**0.0000**	**8.3598**	**8.3598**	**2.7000e-003**	**0.0000**	**8.4274**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.3000e-004	1.6700e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4082	0.4082	1.0000e-005	1.0000e-005	0.4118
Total	**1.5000e-004**	**1.3000e-004**	**1.6700e-003**	**0.0000**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4082**	**0.4082**	**1.0000e-005**	**1.0000e-005**	**0.4118**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0283	0.0000	0.0283	0.0137	0.0000	0.0137	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7900e-003	0.0834	0.0611	1.2000e-004		3.7600e-003	3.7600e-003		3.4600e-003	3.4600e-003	0.0000	10.4219	10.4219	3.3700e-003	0.0000	10.5062
Total	**7.7900e-003**	**0.0834**	**0.0611**	**1.2000e-004**	**0.0283**	**3.7600e-003**	**0.0321**	**0.0137**	**3.4600e-003**	**0.0172**	**0.0000**	**10.4219**	**10.4219**	**3.3700e-003**	**0.0000**	**10.5062**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	2.2300e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5442	0.5442	2.0000e-005	1.0000e-005	0.5490
Total	**2.1000e-004**	**1.7000e-004**	**2.2300e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5442**	**0.5442**	**2.0000e-005**	**1.0000e-005**	**0.5490**

3.4 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0108	0.0000	0.0108	5.2400e-003	0.0000	5.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7900e-003	0.0834	0.0611	1.2000e-004		3.7600e-003	3.7600e-003		3.4600e-003	3.4600e-003	0.0000	10.4219	10.4219	3.3700e-003	0.0000	10.5062
Total	**7.7900e-003**	**0.0834**	**0.0611**	**1.2000e-004**	**0.0108**	**3.7600e-003**	**0.0146**	**5.2400e-003**	**3.4600e-003**	**8.7000e-003**	**0.0000**	**10.4219**	**10.4219**	**3.3700e-003**	**0.0000**	**10.5062**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	2.2300e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5442	0.5442	2.0000e-005	1.0000e-005	0.5490
Total	**2.1000e-004**	**1.7000e-004**	**2.2300e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5442**	**0.5442**	**2.0000e-005**	**1.0000e-005**	**0.5490**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1962	1.7958	1.8818	3.1000e-003		0.0930	0.0930		0.0875	0.0875	0.0000	266.4840	266.4840	0.0638	0.0000	268.0801
Total	**0.1962**	**1.7958**	**1.8818**	**3.1000e-003**		**0.0930**	**0.0930**		**0.0875**	**0.0875**	**0.0000**	**266.4840**	**266.4840**	**0.0638**	**0.0000**	**268.0801**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4900e-003	0.1183	0.0392	4.5000e-004	0.0145	1.0700e-003	0.0156	4.1800e-003	1.0300e-003	5.2100e-003	0.0000	43.9203	43.9203	1.4700e-003	6.3400e-003	45.8449
Worker	0.0351	0.0292	0.3800	1.0100e-003	0.1122	7.3000e-004	0.1129	0.0298	6.8000e-004	0.0305	0.0000	92.8386	92.8386	2.6500e-003	2.5200e-003	93.6561
Total	**0.0396**	**0.1475**	**0.4192**	**1.4600e-003**	**0.1267**	**1.8000e-003**	**0.1285**	**0.0340**	**1.7100e-003**	**0.0357**	**0.0000**	**136.7589**	**136.7589**	**4.1200e-003**	**8.8600e-003**	**139.5010**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1962	1.7958	1.8818	3.1000e-003		0.0930	0.0930		0.0875	0.0875	0.0000	266.4837	266.4837	0.0638	0.0000	268.0798
Total	**0.1962**	**1.7958**	**1.8818**	**3.1000e-003**		**0.0930**	**0.0930**		**0.0875**	**0.0875**	**0.0000**	**266.4837**	**266.4837**	**0.0638**	**0.0000**	**268.0798**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4900e-003	0.1183	0.0392	4.5000e-004	0.0145	1.0700e-003	0.0156	4.1800e-003	1.0300e-003	5.2100e-003	0.0000	43.9203	43.9203	1.4700e-003	6.3400e-003	45.8449
Worker	0.0351	0.0292	0.3800	1.0100e-003	0.1122	7.3000e-004	0.1129	0.0298	6.8000e-004	0.0305	0.0000	92.8386	92.8386	2.6500e-003	2.5200e-003	93.6561
Total	**0.0396**	**0.1475**	**0.4192**	**1.4600e-003**	**0.1267**	**1.8000e-003**	**0.1285**	**0.0340**	**1.7100e-003**	**0.0357**	**0.0000**	**136.7589**	**136.7589**	**4.1200e-003**	**8.8600e-003**	**139.5010**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3000e-003	0.0809	0.1037	1.6000e-004		4.1500e-003	4.1500e-003		3.8300e-003	3.8300e-003	0.0000	13.9195	13.9195	4.3700e-003	0.0000	14.0288
Paving	1.8900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0102**	**0.0809**	**0.1037**	**1.6000e-004**		**4.1500e-003**	**4.1500e-003**		**3.8300e-003**	**3.8300e-003**	**0.0000**	**13.9195**	**13.9195**	**4.3700e-003**	**0.0000**	**14.0288**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	4.9000e-004	6.3100e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8800e-003	4.9000e-004	1.0000e-005	5.1000e-004	0.0000	1.5420	1.5420	4.0000e-005	4.0000e-005	1.5556
Total	**5.8000e-004**	**4.9000e-004**	**6.3100e-003**	**2.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8800e-003**	**4.9000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5420**	**1.5420**	**4.0000e-005**	**4.0000e-005**	**1.5556**

3.6 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3000e-003	0.0809	0.1037	1.6000e-004		4.1500e-003	4.1500e-003		3.8300e-003	3.8300e-003	0.0000	13.9195	13.9195	4.3700e-003	0.0000	14.0288
Paving	1.8900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0102**	**0.0809**	**0.1037**	**1.6000e-004**		**4.1500e-003**	**4.1500e-003**		**3.8300e-003**	**3.8300e-003**	**0.0000**	**13.9195**	**13.9195**	**4.3700e-003**	**0.0000**	**14.0288**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	4.9000e-004	6.3100e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8800e-003	4.9000e-004	1.0000e-005	5.1000e-004	0.0000	1.5420	1.5420	4.0000e-005	4.0000e-005	1.5556
Total	**5.8000e-004**	**4.9000e-004**	**6.3100e-003**	**2.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8800e-003**	**4.9000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5420**	**1.5420**	**4.0000e-005**	**4.0000e-005**	**1.5556**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.6000e-004	4.4000e-003	6.1000e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.0000e-004	2.0000e-004	0.0000	0.8189	0.8189	2.6000e-004	0.0000	0.8254
Paving	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.7000e-004**	**4.4000e-003**	**6.1000e-003**	**1.0000e-005**		**2.2000e-004**	**2.2000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.8189**	**0.8189**	**2.6000e-004**	**0.0000**	**0.8254**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0883	0.0883	0.0000	0.0000	0.0891
Total	**3.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0883**	**0.0883**	**0.0000**	**0.0000**	**0.0891**

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.6000e-004	4.4000e-003	6.1000e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.0000e-004	2.0000e-004	0.0000	0.8189	0.8189	2.6000e-004	0.0000	0.8254
Paving	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.7000e-004**	**4.4000e-003**	**6.1000e-003**	**1.0000e-005**		**2.2000e-004**	**2.2000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.8189**	**0.8189**	**2.6000e-004**	**0.0000**	**0.8254**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0883	0.0883	0.0000	0.0000	0.0891
Total	**3.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0883**	**0.0883**	**0.0000**	**0.0000**	**0.0891**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2813					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7200e-003	0.0117	0.0163	3.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	2.2979	2.2979	1.4000e-004	0.0000	2.3014
Total	**0.2830**	**0.0117**	**0.0163**	**3.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.4000e-004**	**0.0000**	**2.3014**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.1000e-004	5.5300e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4308	1.4308	4.0000e-005	4.0000e-005	1.4427
Total	**5.1000e-004**	**4.1000e-004**	**5.5300e-003**	**2.0000e-005**	**1.7800e-003**	**1.0000e-005**	**1.7900e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.4308**	**1.4308**	**4.0000e-005**	**4.0000e-005**	**1.4427**

3.7 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2813					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7200e-003	0.0117	0.0163	3.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	2.2979	2.2979	1.4000e-004	0.0000	2.3014
Total	**0.2830**	**0.0117**	**0.0163**	**3.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.4000e-004**	**0.0000**	**2.3014**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.1000e-004	5.5300e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4308	1.4308	4.0000e-005	4.0000e-005	1.4427
Total	**5.1000e-004**	**4.1000e-004**	**5.5300e-003**	**2.0000e-005**	**1.7800e-003**	**1.0000e-005**	**1.7900e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.4308**	**1.4308**	**4.0000e-005**	**4.0000e-005**	**1.4427**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1873	0.2726	2.3085	6.0100e-003	0.6303	4.3400e-003	0.6346	0.1678	4.0200e-003	0.1719	0.0000	562.5438	562.5438	0.0295	0.0229	570.1109
Unmitigated	0.1873	0.2726	2.3085	6.0100e-003	0.6303	4.3400e-003	0.6346	0.1678	4.0200e-003	0.1719	0.0000	562.5438	562.5438	0.0295	0.0229	570.1109

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	420.84	412.44	343.56	1,396,248	1,396,248
High Turnover (Sit Down Restaurant)	188.00	244.80	285.28	286,210	286,210
Parking Lot	0.00	0.00	0.00		
Total	608.84	657.24	628.84	1,682,458	1,682,458

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
High Turnover (Sit Down	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268
High Turnover (Sit Down Restaurant)	0.571655	0.046885	0.214996	0.124959	0.016076	0.001938	0.006369	0.009753	0.000792	0.000664	0.005429	0.000215	0.000268
Parking Lot	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	76.8149	76.8149	6.4800e-003	7.9000e-004	77.2112
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	76.8149	76.8149	6.4800e-003	7.9000e-004	77.2112
NaturalGas Mitigated	8.4000e-003	0.0732	0.0405	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003	0.0000	83.1543	83.1543	1.5900e-003	1.5200e-003	83.6485
NaturalGas Unmitigated	8.4000e-003	0.0732	0.0405	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003	0.0000	83.1543	83.1543	1.5900e-003	1.5200e-003	83.6485

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.09759e+006	5.9200e-003	0.0506	0.0215	3.2000e-004		4.0900e-003	4.0900e-003		4.0900e-003	4.0900e-003	0.0000	58.5718	58.5718	1.1200e-003	1.0700e-003	58.9198
High Turnover (Sit Down Restaurant)	460660	2.4800e-003	0.0226	0.0190	1.4000e-004		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	24.5826	24.5826	4.7000e-004	4.5000e-004	24.7287
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.4000e-003**	**0.0732**	**0.0405**	**4.6000e-004**		**5.8100e-003**	**5.8100e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**83.1543**	**83.1543**	**1.5900e-003**	**1.5200e-003**	**83.6485**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.09759e+006	5.9200e-003	0.0506	0.0215	3.2000e-004		4.0900e-003	4.0900e-003		4.0900e-003	4.0900e-003	0.0000	58.5718	58.5718	1.1200e-003	1.0700e-003	58.9198
High Turnover (Sit Down Restaurant)	460660	2.4800e-003	0.0226	0.0190	1.4000e-004		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	24.5826	24.5826	4.7000e-004	4.5000e-004	24.7287
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.4000e-003**	**0.0732**	**0.0405**	**4.6000e-004**		**5.8100e-003**	**5.8100e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**83.1543**	**83.1543**	**1.5900e-003**	**1.5200e-003**	**83.6485**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	323345	57.3439	4.8400e-003	5.9000e-004	57.6397
High Turnover (Sit Down Restaurant)	86540	15.3475	1.3000e-003	1.6000e-004	15.4267
Parking Lot	23251.5	4.1236	3.5000e-004	4.0000e-005	4.1448
Total		**76.8149**	**6.4900e-003**	**7.9000e-004**	**77.2112**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	323345	57.3439	4.8400e-003	5.9000e-004	57.6397
High Turnover (Sit Down Restaurant)	86540	15.3475	1.3000e-003	1.6000e-004	15.4267
Parking Lot	23251.5	4.1236	3.5000e-004	4.0000e-005	4.1448
Total		**76.8149**	**6.4900e-003**	**7.9000e-004**	**77.2112**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3711	0.0248	0.8736	1.4000e-004		6.0000e-003	6.0000e-003		6.0000e-003	6.0000e-003	0.0000	18.5625	18.5625	1.6900e-003	3.1000e-004	18.6985
Unmitigated	0.3711	0.0248	0.8736	1.4000e-004		6.0000e-003	6.0000e-003		6.0000e-003	6.0000e-003	0.0000	18.5625	18.5625	1.6900e-003	3.1000e-004	18.6985

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0281					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.7300e-003	0.0148	6.3000e-003	9.0000e-005		1.2000e-003	1.2000e-003		1.2000e-003	1.2000e-003	0.0000	17.1458	17.1458	3.3000e-004	3.1000e-004	17.2477
Landscaping	0.0262	0.0100	0.8673	5.0000e-005		4.8000e-003	4.8000e-003		4.8000e-003	4.8000e-003	0.0000	1.4167	1.4167	1.3700e-003	0.0000	1.4509
Total	**0.3711**	**0.0248**	**0.8736**	**1.4000e-004**		**6.0000e-003**	**6.0000e-003**		**6.0000e-003**	**6.0000e-003**	**0.0000**	**18.5625**	**18.5625**	**1.7000e-003**	**3.1000e-004**	**18.6985**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0281					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.7300e-003	0.0148	6.3000e-003	9.0000e-005		1.2000e-003	1.2000e-003		1.2000e-003	1.2000e-003	0.0000	17.1458	17.1458	3.3000e-004	3.1000e-004	17.2477
Landscaping	0.0262	0.0100	0.8673	5.0000e-005		4.8000e-003	4.8000e-003		4.8000e-003	4.8000e-003	0.0000	1.4167	1.4167	1.3700e-003	0.0000	1.4509
Total	**0.3711**	**0.0248**	**0.8736**	**1.4000e-004**		**6.0000e-003**	**6.0000e-003**		**6.0000e-003**	**6.0000e-003**	**0.0000**	**18.5625**	**18.5625**	**1.7000e-003**	**3.1000e-004**	**18.6985**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	22.8435	0.1999	4.8900e-003	29.2984
Unmitigated	22.8435	0.1999	4.8900e-003	29.2984

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	5.47294 / 3.45033	21.1727	0.1800	4.4100e-003	26.9862
High Turnover (Sit Down Restaurant)	0.607067 / 0.038749	1.6708	0.0199	4.8000e-004	2.3121
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**22.8435**	**0.1999**	**4.8900e-003**	**29.2984**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	5.47294 / 3.45033	21.1727	0.1800	4.4100e-003	26.9862
High Turnover (Sit Down Restaurant)	0.607067 / 0.038749	1.6708	0.0199	4.8000e-004	2.3121
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**22.8435**	**0.1999**	**4.8900e-003**	**29.2984**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	12.6748	0.7491	0.0000	31.4012
Unmitigated	12.6748	0.7491	0.0000	31.4012

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	38.64	7.8436	0.4635	0.0000	19.4321
High Turnover (Sit Down Restaurant)	23.8	4.8312	0.2855	0.0000	11.9691
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**12.6748**	**0.7491**	**0.0000**	**31.4012**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	38.64	7.8436	0.4635	0.0000	19.4321
High Turnover (Sit Down Restaurant)	23.8	4.8312	0.2855	0.0000	11.9691
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**12.6748**	**0.7491**	**0.0000**	**31.4012**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Atlantic Avenue Project

Noise Assessment Study

JUNE 2021 | BRW-01

Prepared for:

Brandywine Homes
16580 Aston
Irvine, CA 92606

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Atlantic Avenue Project

Noise Assessment Study

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Updated June 2021 | BRW-01

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ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
APN	Assessor’s Parcel Number
ASTM	American Society for Testing and Materials
CadnaA	Computer Aided Noise Abatement
CALGreen	California Green Building Code
Caltrans	California Department of Transportation
City	City of Long Beach
CNEL	Community Noise Equivalent Level
CCR	California Code of Regulations
dB	decibel
dBA	A-weighted decibels
FHWA	Federal Highway Administration
HVAC	Heating, ventilation, and air conditioning
Hz	Hertz
kHz	kilohertz
L_{DN}	Day-Night level
L_{EQ}	equivalent sound level
LLG	Linscott, Law & Greenspan, Engineers
mPa	micro-Pascals
mph	miles per hour
NSLU	noise-sensitive land use
OITC	Outdoor–Indoor Sound Transmission Class
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
STC	Sound Transmission Class
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation

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EXECUTIVE SUMMARY

This report analyzes potential noise impacts associated with the proposed Atlantic Avenue Project (project), located in the City of Long Beach. The project involves the site remediation and construction of a new three-story mixed-use development with 84 multi-family residential units.

The project would generate noise during construction, but construction would occur within the allowable hours of the City of Long Beach Municipal Code and would not result in a significant impact. Project-generated noise from on-site stationary sources (heating, ventilation, and air conditioning [HVAC] units) would not generate noise in excess of allowable levels at off-site residential uses. Similarly, the project would add traffic to nearby roadways, but transportation noise impacts to off-site land uses would be less than significant. Transportation noise impacts to the project's proposed residential and commercial uses would be accounted for with appropriate building materials to ensure compliance with applicable noise standards and codes.

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential noise impacts associated with the proposed Atlantic Avenue Project (project). The analysis includes a description of existing conditions in the project vicinity and an assessment of potential impacts associated with project implementation. Analysis within this report addresses compliance with City of Long Beach (City) noise standards and the California Green Building Standards Code (CALGreen).

1.2 PROJECT LOCATION

The proposed project is located at the northwest corner of South Street and Atlantic Avenue (Assessor's Parcel Numbers [APNs] 7125-033-031 through 7125-033-054) in the city of Long Beach. See Figure 1, *Regional Location*, and Figure 2, *Aerial Photograph*. The project site has a zoning designation of Mixed Use (MU) with A-Series Overlay.

1.3 PROJECT DESCRIPTION

The project involves the site remediation and construction of a new three-story mixed use development with 84 multi-family residential units. The project would have a combination of first floor (ground level) commercial and live-work uses along the Atlantic Avenue street front, and a residential parking garage opening into the central area from Linden Avenue. With the exception of commercial uses along Atlantic Avenue and wrapping around the corner of South Street, all remaining area is residential. Refer to Figure 3, *Site Plan*.

1.4 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

1.4.1 Descriptors

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

1.4.2 Terminology

1.4.2.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

1.4.2.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

1.4.2.3 Sound Pressure Levels and Decibels

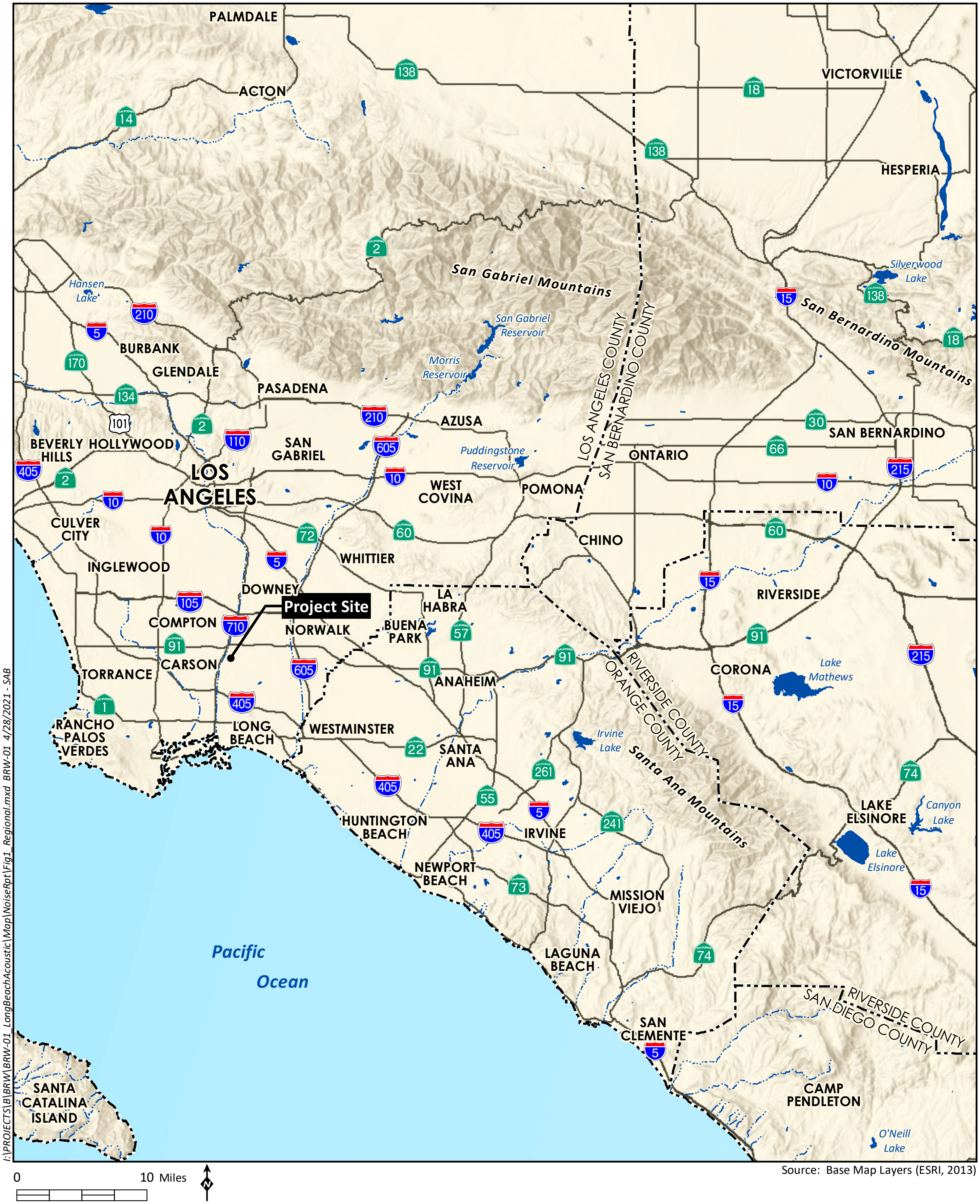
The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this wide range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 mPa.

1.4.2.4 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than from one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of

Atlantic Avenue



Source: Base Map Layers (ESRI, 2013)

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HELIX
Environmental Planning

Regional Location

Figure 1

Atlantic Avenue

Source: Aerial (NearMap, 2020)

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HELIX Environmental Planning

Aerial Photograph

Figure 2

SITE PLAN

BRANDYWINE HOMES

RHYTHM
LONG BEACH

RTHM
5801 Atlantic Avenue, Long Beach, California

1" = 20'-0"
0 20 40 60

WITHEE MALCOLM
ARCHITECTS
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Job No. B8085 Date.06.14.2021 01-01

1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

No known studies have directly correlated the ability of a healthy human ear to discern specific levels of change in traffic noise over a 24-hour period. Many ordinances, however, specify a change of 3 CNEL as the significant impact threshold. This is based on the concept of a doubling in noise energy resulting in a 3 dBA change in noise, which is the amount of change in noise necessary for the increase to be perceptible to the average healthy human ear.

1.5 NOISE-SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise. Noise receptors are individual locations that may be affected by noise. NSLUs in the vicinity of the project site include single-family and multi-family residences to the north, west, and south, a library to the east, and a church to the northwest.

1.6 REGULATORY FRAMEWORK

The City's code revisions for noise are in process. These updates may result in a change to the code or number of the following information but should not affect project planning and compliance requirements.

1.6.1 California Noise Control Act

The California Noise Control Act is a section within the California Health and Safety Code that describes excessive noise as a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

1.6.2 CALGreen Non-Residential Mandatory Measures

The following standards pertaining to acoustic noise control from the 2019 CALGreen (California Code of Regulations [CCR] Title 24, Part 11, Subsection 5.507, Environmental Comfort) for non-residential buildings are applicable to this project.

> **5.507.4 Acoustical control**. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with American Society for Testing and Materials (ASTM) E 90 and ASTM E 413 or Outdoor–Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

5.507.4.2 Performance method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{EQ} 1-hour) of 50 dBA in occupied areas during any hour of operation.

1.6.3 California Building Code

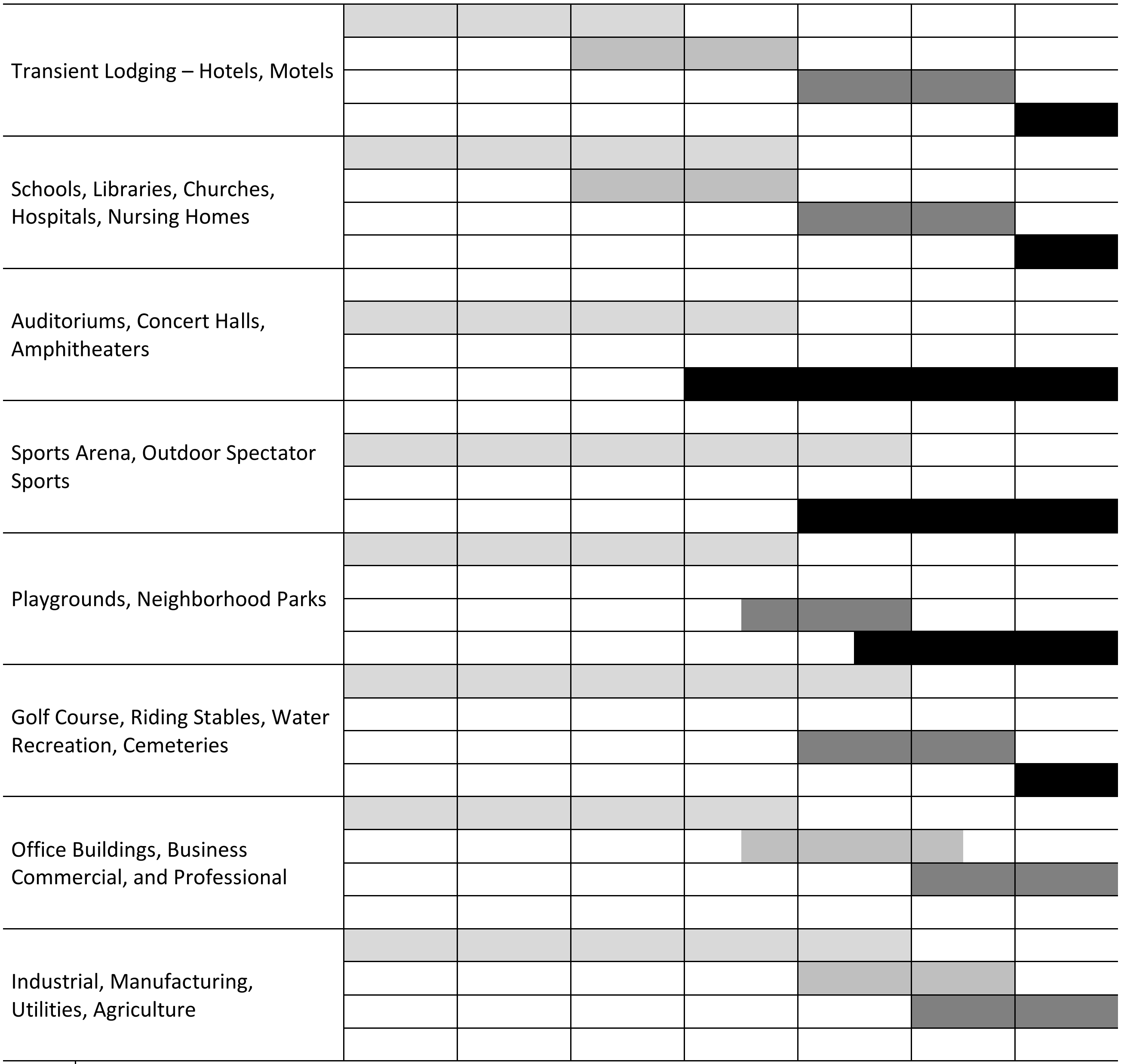
The State of California's noise insulation standards are codified in CCR Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of ensuring that the level of exterior noise transmitted to and received within the interior living spaces of buildings is compatible with their comfortable use. For new residential dwellings, hotels, motels, dormitories, and school classrooms, the acceptable interior noise limit for habitable rooms in new construction is 45 dBA CNEL or L_{DN}. Title 24 requires acoustical studies for residential development in areas exposed to more than 60 dBA CNEL to demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. Where exterior noise levels are projected to exceed 60 dBA CNEL or L_{DN} at the facade of a building, a report must be submitted with the building plans that describe the noise control measures that have been incorporated into the design of the project to meet the 45 dBA CNEL or L_{DN} noise limit.

1.6.4 City of Long Beach Noise Element

The City's Draft General Plan Noise Element (City 2019) includes land use compatibility guidelines for noise exposure that are adopted from the State Land Use Compatibility Criteria. These compatibility standards are included below in Table 1, *Land Use Compatibility Guidelines for Noise Exposure*

Table 1
LAND USE COMPATIBILITY GUIDELINES FOR NOISE EXPOSURE

Land Use	Community Noise Exposure (L_{DN} or CNEL)						
	55	60	65	70	75	80	
Residential – Low Density Single Family Duplex, Mobile Homes	░	░					
		▒	▒	▒			
					▓		
						█	█
Residential – Multi-Family	░	░	░				
			▒	▒			
					▓		
						█	█



☐	NORMALLY ACCEPTABLE – Specified land use is satisfactory, based upon the assumption that any buildings involved meet conventional Title 24 construction standards. No special noise insulation requirements.
▨	CONDITIONALLY ACCEPTABLE – New construction or development shall be undertaken only after a detailed noise analysis is made and noise reduction measures are identified and included in the project design.
▩	NORMALLY UNACCEPTABLE – New construction or development is discouraged. If new construction is proposed, a detailed analysis is required, noise reduction must be identified, and noise insulation features included in the design.
■	CLEARLY UNACCEPTABLE—New construction or development clearly should not be undertaken.

1.6.5 City of Long Beach Municipal Code, Chapter 8.80 - Noise

The City Noise Ordinance is provided in Chapter 8.80 of the City Municipal Code. Portions of the Noise Ordinance applicable to this analysis are reproduced below.

Section 8.80.150 - Exterior noise limits—Sound levels by receiving land use district.

A. The noise standards for the various land use districts identified by the noise control office as presented in Table A in Section 8.80.160 (reproduced herein as Table 2, *Exterior Noise Limits,* below) shall, unless otherwise specifically indicated, apply to all such property within a designated district.

B. No person shall operate or cause to be operated any source of sound at any location within the incorporated limits of the city or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured from any other property, either incorporated or unincorporated, to exceed:

   1. The noise standard for that land use district as specified in Table A in Section 8.80.160 (reproduced herein as Table 2, below) for a cumulative period of more than 30 minutes in any hour; or

   2. The noise standard plus 5 dB for a cumulative period of more than 15 minutes in any hour; or

   3. The noise standard plus 10 dB for a cumulative period of more than 5 minutes in any hour; or

   4. The noise standard plus 15 dB for a cumulative period of more than 1 minute in any hour; or

   5. The noise standard plus 20 dB or the maximum measured ambient, for any period of time.

C. If the measured ambient level exceeds that permissible within any of the first four noise limit categories in subsection B of this section, the allowable noise exposure standard shall be increased in 5 dB increments in each category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category in subsection B of this section, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

D. If the measurement location is on a boundary between two different districts, the noise level limit applicable shall be the arithmetic mean of the two districts.

E. If possible, the ambient noise shall be measured at the same location along the property line utilized in subsection B of this section, with the alleged offending noise source inoperative. If for any reason the alleged offending noise source cannot be shut down, then the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance such that the offending noise from the source is inaudible. If the difference between the noise levels with noise source operating and not operating is 6 dB or greater, then the noise measurement of the alleged source can be considered valid with a small correction applied to account for the contribution of the ambient noise. The correction is to be applied in accordance with data shown in Table B in Section 8.80.160.

Section 8.80.160 - Exterior noise limits—Correction for character of sound.

In the event that alleged offensive noise contains a steady audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting or contains music or speech conveying informational content, the standard limits set forth in Table A (reproduced herein as Table 2, below) shall be reduced by five decibels.

Table 2
EXTERIOR NOISE LIMITS

Receiving Land Use District*	Time Period	Noise Level** (dBA)
District One	Night: 10:00 p.m. – 7:00 a.m. Day: 7:00 a.m. – 10:00 p. m.	45 50
District Two	Night: 10:00 p.m. – 7:00 a.m. Day: 7:00 a.m. – 10:00 p.m.	55 60
District Three	Any time	65
District Four	Any time	70
District Five	Regulated by other agencies and laws	

Source: City of Long Beach Municipal Code Chapter 8.80.

* *District One*: Predominantly residential with other land use types also present.
District Two: Predominantly commercial with other land use types also present.
Districts Three and Four: Predominantly industrial with other land types use also present.
District Five: Airport, freeways, and waterways regulated by other agencies.

** Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts.

Section 8.80.202 – Construction Activity—Noise regulations.

No person shall operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling, demolition or any other related building activity which produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity between the hours of 7:00 p.m. and 7:00 a.m. the following day on weekdays, Saturdays before 9:00 a.m., Saturdays after 6:00 p.m., and all day on Sundays, except for emergency work authorized by the City of Long Beach. For purposes of this Section, a federal holiday shall be considered a weekday.

2.0 ENVIRONMENTAL SETTING

2.1 SURROUNDING LAND USES

Surrounding land uses consist of the Michelle Obama Neighborhood Library and an auto parts store to the east across Atlantic Avenue; commercial uses to the south across South Street and to the southwest across Linden Avenue; residential uses and a church to the west across Linden Avenue; and residential uses and a vacant lot to the north across 59th Street (refer to Figure 2). The project site and parcels to the north, south, and east are zoned Mixed Use (MU) and parcels to the west are zoned Residential.

Although the area surrounding the project site is developed, there is the potential for redevelopment to increase the density of land uses in the surrounding blocks (just as the proposed project increases development density). It is reasonable to assume that the area will experience some minor increases in future noise levels due to increased roadway traffic.

2.2 NOISE ENVIRONMENT

2.2.1 Existing Noise

The dominant noise sources in the vicinity of the project site are associated with vehicular traffic on Atlantic Avenue and South Street with some minor noise from Linden Avenue and 59th Street. The project site is approximately 2.6 miles north of the Long Beach Airport (LGB) and shown outside the airport noise contours and is significantly below 60 CNEL. Therefore, aircraft noise is considered negligible and is not further analyzed in this report.

2.2.2 Ambient Noise Survey

A 1-hour equivalent (15 minute) measurement with traffic count was taken at the project site for the ambient noise survey. The measurement was recorded at the center of the project site approximately 30 feet from Atlantic Avenue. The measured noise level and conditions are shown in Table 3, *Noise Measurement Results*. The measured one-hour equivalent noise level for the visit was 65.6 dBA.

Table 3
NOISE MEASUREMENT RESULTS

Measurement 1 - Ambient			
Date:	April 28, 2021		
Conditions:	Temperature: Low 70s °F. No Wind. Low humidity.		
Time:	12:35 p.m. –12:50 p.m.		
Location:	Center of site approx. 30 feet from Atlantic Avenue		
Measured Noise Level:	65.6 dBA L_{EQ}		
Notes:	Road traffic noise primary noise source		
Vehicle Counts:	Cars – 204	Light Trucks – 12	Heavy Trucks – 0

2.2.3 Future Noise Planning

The project site is within the Atlantic Avenue “Complete Streets” Improvements planning area. The City intends to implement multimodal improvements along the northern section of Atlantic Avenue, between Artesia Boulevard and 51st Street, in an effort to accommodate anticipated growth in North Long Beach. These modifications include converting the roadway segment into a two-lane divided roadway with an on-street "buffered” bike lane and parallel curbside parking and would affect the existing intersection configurations adjacent to the project site.

The timeline to implement these improvements is currently unknown; therefore, this study analyzes the potential impacts of the proposed project based on both existing roadway conditions and proposed roadway conditions with the “Complete Streets” improvements.

3.0 ANALYSIS, METHODOLOGY, AND ASSUMPTIONS

3.1 METHODOLOGY

3.1.1 Ambient Noise Survey

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis 831 Noise Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers’ standards.

3.1.2 Noise Modeling Software

Modeling of the exterior noise environment for this report was accomplished using two computer noise models: Computer Aided Noise Abatement (CadnaA) version 2019 and Traffic Noise Model (TNM) version 2.5. CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts. CadnaA traffic noise prediction is based on the data and methodology used in the TNM.

TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (California

Department of Transportation [Caltrans] 2004). Peak-hour traffic volumes are estimated based on the assumption that approximately 10 percent of the average daily traffic would occur during a peak hour. The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic. Peak hour L_{EQ} can be converted to CNEL using the following equation, where $L_{EQ}(h)pk$ is the peak hour L_{EQ}, P is the peak hour volume percentage of the average daily trips (ADT), d and e are divisions of the daytime fraction of ADT to account for daytime and evening hours, and N is the nighttime fraction of ADT:

$$\text{CNEL} = L_{EQ}(h)pk + 10\log10\ 4.17/P + 10\log10(d + 4.77e + 10N)$$

The model-calculated one-hour L_{EQ} noise output is therefore approximately equal to the CNEL (Caltrans 2013).

3.1.3 Exterior-to-Interior Analysis

Traditional architectural materials are conservatively estimated (by the building code) to attenuate noise levels by 15 dBA/CNEL. Planning methods for determining exterior-to-interior noise levels are documented by The American Institute of Physics for the Acoustical Society of America in *Acoustical Design in Architecture* (1980).

The information in the interior noise analysis includes wall heights/lengths, room volumes, and window/door tables typical for a standard building plan, as well as information on any other openings in the building shell. The analysis provides noise control specifications for the project rooms with the highest potential interior noise levels and extends these requirements to other applicable project rooms.

3.2 ASSUMPTIONS

3.2.1 Construction Activities

Project construction would entail the use of equipment throughout the site for the full term of construction. Construction activities would be roughly divided into six phases. These phases may contain some overlap depending upon location and timing. The phases would include the following:

- Material Removal for site remediation
- Grading
- Foundation excavation
- Foundation pour
- Utilities excavation
- Building construction

Most construction equipment does not operate at full power (maximum noise) for a full hour. The Federal Highway Administration (FHWA) guidelines analyze most equipment at an assumed 40-percent hourly operating time.

3.2.2 Operation

The proposed project's operational noise sources are anticipated to include heating, ventilation, and air conditioning (HVAC) systems and vehicular traffic.

3.2.2.1 Heating, Ventilation, and Air Conditioning (HVAC) Units

The project's commercial HVAC systems would be mounted on building rooftops surrounded with visual and acoustic screening walls and the residential units will be ground mounted. Specific planning data for the future HVAC systems is not available at this time. Therefore, to estimate operational impacts of the project, the noise from typical commercial and residential systems is used as a basis for analysis. This information is shown in Table 4, *HVAC Condenser Noise Planning Information (Typical Units)*.

Table 4
HVAC CONDENSER NOISE PLANNING INFORMATION (TYPICAL UNITS)

Location	All Units, Daikin	dBA S_{WL}
Commercial Spaces	RXYQ72TTJU	76.5
Residential Units	RX18RMVJU	73.2

S_{WL} = Sound Power Level

3.2.2.2 Vehicular Traffic

Traffic planning information is provided in the project's Traffic Study prepared by Linscott, Law & Greenspan, Engineers (LLG) dated April 20, 2021. Project-generated traffic (shown in Table 5, *Project Traffic Generation Forecast*) is noted to travel 55 percent to/from Atlantic Avenue north of the site, 30 percent to/from Atlantic Avenue south of the site, and 15 percent to/from South Street east of the site. Future (year 2024) traffic volumes used in the analysis presented below are shown in Table 6, *Year 2024 Cumulative PM Peak Traffic for Analysis.*

Table 5
PROJECT TRAFFIC GENERATION FORECAST

Net Trip Generation						
Daily 2-Way	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
579	16	28	44	30	18	48

Source: LLG 2021

Table 6
YEAR 2024 CUMULATIVE PM PEAK TRAFFIC FOR ANALYSIS

Traffic Volumes (average daily trips)			
	North	**Adjacent**	**South**
Linden Avenue	117	96	53
Atlantic Avenue	1,120	1,988	1,875
	West	**Adjacent**	**East**
59th St	67	152	104
South Street	696	836	1,419

Source: LLG 2021

The posted and assumed speed limits and truck percentages for adjacent streets are shown in Table 7 *Traffic Noise Planning Information*, below.

Table 7
TRAFFIC NOISE PLANNING INFORMATION

Roadway	Vehicle Distribution				Speed (mph)
	Auto	Medium Truck[1]	Bus	Heavy Truck[2]	
Linden Avenue	100.00%	0.00%	0.00%	0.00%	25
Atlantic Avenue	94.50%	4.00%	1.00%	0.50%	30
59th Street	100.00%	0.00%	0.00%	0.00%	25
Hullet Street	100.00%	0.00%	0.00%	0.00%	25
South Street	94.50%	4.00%	1.00%	0.50%	35

[1] 2 axles

[2] 3 or more axles

4.0 IMPACT ANALYSIS

4.1 ISSUE 1: EXCESSIVE OFF-SITE CONSTRUCTION NOISE IMPACTS

4.1.1 Remediation Materials Offsite Transportation

Site remediation includes the removal of asphalt and other contaminated soil materials. The asphalt will be broken up with a backhoe and loaded into trucks for transportation to an approved offsite disposal site. Materials removal is anticipated to generate approximately 3,750 tons. The normal trip payload for truck removal is 23 tons per truck load (163 truckloads). The expected daily load count will average 12 loads a day for a two-week operation. This would require a typical maximum of 2 In/Out truck trips per hour. The noise impact from four truck trips along Atlantic Avenue at the edge of the roadway is approximately 53.7 dBA L_{EQ}, which would change the overall roadway traffic noise by less than 0.1 dBA per hour and is not a significant impact.

4.1.2 Onsite Construction

Excavation activities often generate the loudest noise that occurs during a project's construction. Excavation activities for the proposed project would involve excavation of both the site remediation work and the planned new structure foundation and utility trenching, which are anticipated to use an excavator (or backhoe), a loader, and dump trucks. These activities would generate the loudest noise levels at nearby off-site uses.

The FHWA Roadway Construction Noise Model (RCNM) Version 1.0 (February 2, 2006) lists the noise level for an excavator as 85 dBA at 50 feet. Excavation for the project would occur throughout much of the site. The closest residential use to a typical excavator work location on the project site is approximately 70 feet. A loader and dump truck would be at a greater distance, typically expected at around 80 feet. The noise while all equipment is in operation would be approximately 75.6 dBA at 50 feet.

At the nearest property line, assuming three hours out of a normal eight-hour construction day, with all the equipment – one excavator, one loader, and one dump truck – operating simultaneously for 40 percent of the time, the average noise level over an eight-hour period would be 71.5 dBA. The City of Long Beach Municipal Code does not specify a limit on weekday daytime construction noise levels; therefore, project construction during the allowable hours would not be significant.

4.2 ISSUE 2: EXCESSIVE OFF-SITE OPERATIONAL NOISE IMPACTS

4.2.1 Stationary Source Noise

The primary stationary noise source associated with the proposed project with the potential for noise impacts would be the HVAC equipment. As previously discussed, the commercial HVAC systems would be mounted on the building rooftop surrounded with visual and acoustic screening walls. Specific planning data for the future HVAC systems is not available. However, to estimate operational impacts of the project, the noise from several large rooftop units was used as a basis for analysis for the commercial systems.

The calculated noise levels for the two HVAC/refrigeration systems at the upper (second and third floor) window levels of the adjacent buildings were estimated to be 42.6 dBA L_{EQ} (at 20 feet) and the single residential AC unit 36.6 dBA L_{EQ} at 20 feet. The property line noise level impact threshold for nighttime noise at residential uses is 45 dBA (refer to Table 2, above). Therefore, stationary source noise impacts to off-site receptors would be less than significant and the project would be in compliance with the City's noise ordinance. No HVAC noise mitigation would be required.

4.2.2 Traffic Noise

The project would generate vehicular traffic that would travel along Atlantic Avenue north of the site, Atlantic Avenue south of the site, and South Street east of the site and would have the potential to generate increased noise levels over existing conditions. TNM software was used to calculate noise levels for the Existing and Existing Plus Project conditions at a distance of 50 feet for these three roadways segments to determine the change in noise levels. Traffic volumes were provided in the project's Traffic Study (LLG 2021).

A significant impact would occur if project-generated traffic results in a perceptible change of 3 dBA over existing conditions. The off-site roadway modeling represents a conservative analysis that does not consider topography or attenuation provided by existing structures. The results of the analysis are shown below in Table 8, *Off-site Traffic Noise Levels.* As shown in the table, project-generated traffic would not result in an increase of 3 dBA, and impacts would be less than significant.

Table 8
OFF-SITE TRAFFIC NOISE LEVELS

Roadway Segment	Existing PM Peak Hour Volume	Existing Noise at 50 feet	Existing Plus Project PM Peak Hour Volume	Existing Plus Project Noise at 50 feet	Change in Noise
Atlantic Avenue					
North of Project Site	1,956	64.7	1,983	64.7	0.0
South of Project Site	1,810	64.3	1,824	64.4	+0.1
South Street					
East of Project Site	1,372	65.1	1,380	65.1	0.0

LLG 2021

4.3 ISSUE 3: EXCESSIVE ON-SITE INTERIOR NOISE IMPACTS

4.3.1 Transportation Noise

Noise generated in the project vicinity is primarily from vehicular traffic noise, and the project's proposed used would be exposed to this noise. To determine the compatibility impacts of traffic noise to the proposed uses, a series of modeling receivers were identified, and traffic noise under future (year 2024) conditions with the existing roadway geometry was modeled. The receiver modeling locations were placed along the periphery of the proposed building at each floor level, starting along the north side of the building at the western corner (Receiver 1) and traveling around the building in a clockwise direction and ending on the west side at the northern corner (Receiver 12). Traffic noise levels at the receiver locations at five-foot elevations for the three floor levels shown in Table 9*, Exterior Noise Levels.*

Table 9
EXTERIOR NOISE LEVELS

Receiver	Noise Level (dBA/CNEL)		
	1st Floor	2nd Floor	3rd Floor
1	56.8	55.9	55.6
2	58.1	57.2	57.2
3	65.5	65.1	64.6
4	67.9	67.3	66.9
5	68.5	67.8	67.3
6	69.5	68.9	68.5
7	67.9	67.4	67.0
8	66.4	65.8	65.5
9	65.9	65.4	65.0
10	62.2	61.7	61.3
11	54.2	53.6	53.2
12	54.7	54.1	53.7

The receiver locations are shown on Figure 4, *Receivers and Noise Contours*, with the traffic noise contours (as-is with no buildings) displayed across the site at a five-foot elevation on the ground level. These exterior noise levels are used to determine interior noise impacts, as presented in the following sections.

4.3.2 Residential Interior Noise

Exterior-to-interior planning assumes a minimum 15-CNEL reduction from outside to inside a building structure; therefore, if noise levels exceed 60 CNEL, interior noise levels may exceed the City's 45-CNEL interior noise standard for the proposed multi-family residential uses. As shown in Table 9, the east-facing building façade at the corner of Atlantic Avenue and South Street (Receiver 6) is estimated to be exposed to a transportation noise level of 69.5 CNEL, which is the highest anticipated exterior noise exposure level. With an assumed 15-CNEL reduction, noise levels would be 54.5 CNEL; therefore, additional exterior-to-interior analysis is required to demonstrate compliance with the City's 45-CNEL interior noise requirement for all of the residential units other than those in the central portion of Linden Avenue, where interior noise levels are expected to be 45 CNEL or less.

While specific planning information cannot be provided until the full building plans are available, it is reasonable to anticipate that normal construction exterior walls with STC 28 windows and glass doors would provide sufficient exterior-to-interior noise reduction to comply with the 45-CNEL interior planning requirements per City and California Building Code standards.

4.3.3 Commercial Interior Noise

As discussed above, exterior-to-interior planning assumes a minimum 15-CNEL reduction from outside to inside a building structure; therefore, if noise levels exceed 65 CNEL, interior noise levels may exceed the 50-CNEL CALGreen interior noise standard for the project's proposed commercial uses. As shown in Table 9, the building façade facing South Street (Receiver 7) is estimated to have an exterior noise level from transportation of 67.9 L_{EQ} dBA for the commercial. It is reasonable to anticipate that with a typical storefront window with an STC 27 glazing, the noise level would be below 50 dBA L_{EQ}, which would be in compliance with the CALGreen requirement of a maximum hourly interior noise level of 60 dBA L_{EQ} for commercial uses.

4.3.4 Atlantic Avenue "Complete Streets" Improvements

As discussed above in Section 2.2.3, the City intends to implement multimodal improvements along the northerly section of Atlantic Avenue, between Artesia Boulevard and 51st Street, in an effort to accommodate anticipated growth in North Long Beach. These modifications include converting the segment into a two-lane divided roadway with an on-street "buffered" bike lane and parallel curb side parking. According to the Traffic Study prepared for the project (LLG 2021), this would result in a 20 percent reduction in through traffic on Atlantic Avenue. A 20 percent reduction in traffic along Atlantic Avenue would result in an approximate noise level decrease of 1 dBA/CNEL for the residential units and commercial uses facing Atlantic Avenue. Because the noise levels would be decreased, the architectural specifications identified above in Sections 4.3.2 and 4.3.3 would remain sufficient for compliance with applicable interior noise standards when these improvements are implemented.

4.4 ISSUE 4: EXCESSIVE ON-SITE EXTERIOR USE AREA NOISE IMPACTS

The maximum estimated exterior noise level for the residential exterior use spaces in the interior courtyard is below 45 CNEL, which is less than the allowable 65-CNEL City standard for multi-family exterior use areas. If the exterior second-floor decks facing 59th Street, Atlantic Avenue, or South Street are required (by the City) to comply with the 65-CNEL exterior noise standard a 4 ½ foot tall solid wall would reduce the noise inside the deck area to less than 65 CNEL. The project site would comply with the exterior space standards with no additional noise control.

Atlantic Avenue

Source: Aerial (NearMap, 2020)

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HELIX
Environmental Planning

Receivers and Contours

Figure 4

5.0 LIST OF PREPARERS

Charles Terry, Principal Specialist, Noise, Acoustics & Vibration
Hunter Stapp, Noise Specialist

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

6.0 REFERENCES

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Stantec

Phase I Environmental Site Assessment

Northwest Block – Atlantic and South
APNs 7125-033-900 through -923
Long Beach, California 90805

September 22, 2020

Prepared for:

Brandywine Homes
16580 Aston
Irvine, California 92606

Prepared by:

Stantec Consulting Services Inc.
735 East Carnegie Drive, Suite 280
San Bernardino, California 92408

Project No.: 185804904

Sign-off Sheet and Signatures of Environmental Professionals

This Phase I Environmental Site Assessment was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Brandywine Homes (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the Master Services Agreement ("MSA") between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes.

All information, conclusions, and recommendations provided by Stantec in this document regarding the Phase I ESA have been prepared under the supervision of and reviewed by the professionals whose signatures appear below.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Author: ____

Alicia Jansen
Associate Scientist

Reviewer: ____

Joshua Sargent, PG
Project Geologist

Independent Reviewer: ______________________________

Kyle Emerson, CEG
Managing Principal Geologist

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LIST OF APPENDICES

Abbreviations

AAI	All Appropriate Inquiry
ACM	Asbestos-containing material
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CREC	Controlled Recognized Environmental Conditions
EP	Environmental Professional
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
ft msl	Feet above mean sea level
HREC	Historical Recognized Environmental Conditions
LBP	Lead-based paint
LUST	Leaking Underground Storage Tank
NESHAP	National Emissions Standard for Hazardous Air Pollutants
PCBs	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
USGS	United States Geological Survey
UST	Underground Storage Tank
VEC	Vapor Encroachment Condition
VOCs	Volatile Organic Compounds

1.0 SUMMARY

Stantec Consulting Services Inc. (Stantec) has completed a Phase I Environmental Site Assessment (ESA) report of the property identified as Northwest Block – Atlantic and South – APNs 7125-033-900 through -923, City of Long Beach, County of Los Angeles, California (the "Property"), on behalf of Brandywine Homes (the "Client"). The work was performed in accordance with terms and conditions of the master environment consulting service agreement between Brandywine Homes and Stantec and the work order dated September 2, 2020. Brandywine Homes (the "User") has been designated as the User of this report.

The Phase I ESA was conducted in conformance with the requirements of American Society for Testing and Materials (ASTM) Designation E 1527-13, and All Appropriate Inquiry (AAI) as defined by the US-EPA in Title 40 of the Code of Federal Regulations, Part 312, except as may have been modified by the scope of work, and the Master Services Agreement between Stantec and Client (the "MSA"). Any exceptions to, or deletions from, the ASTM or AAI practice are described in Section 2.3.

The Property consists of approximately 3.2 acres of vacant land bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south, and Linden Avenue to the west. An asphalt parking lot is located in the southern portion of the Property. The surrounding area consists of residential structures, a library, and various restaurants, retail, and salons. A Property location map is illustrated on Figure 1. A Property map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the site reconnaissance visit are provided in Appendix A.

According to historical documents, the Property was developed with a service station and battery shop between 1925 and 1950s (5801 and 5803 Atlantic); automotive repair between circa 1933-1968 (509 and 521 South Street); a clothes cleaner/tailor between 1948 and 1953 (5823 Atlantic); and residential and various commercial uses (i.e. churches, office space, retail, and a bank). All structures were demolished in circa 2006 and the Property has remained a vacant lot since then.

In October 2005, SCS Engineering (SCS) conducted a Phase II ESA at the 5801 Atlantic Avenue Property to evaluate the former service station and auto body repair activities. Stantec was not provided with a copy of this report or a map depicting soil boring locations. The report was summarized in a previous May 2009 Phase I ESA prepared by SCS. According to the summary, four soil vapor samples were collected from 5 feet below ground surface (bgs) and analyzed for volatile organic compounds (VOCs). Seven soil borings were advanced to 20 feet bgs and select soil samples were analyzed for VOCs, total petroleum hydrocarbons (TPH), and Title 22 metals.

No VOCs were detected above the laboratory reporting limit of 1 microgram per liter (ug/L) in any of the soil vapor samples collected. Of the 19 soil samples analyzed, one (B2-10') contained benzene and toluene at concentrations of 11.4 and 10.3 micrograms per kilogram (ug/kg), respectively. Of the 19 soil samples analyzed, three contained TPH-diesel and TPH-oil at concentrations of 27.9 and 256 milligrams per kilogram (mg/kg), respectively. The reported concentrations were below regulatory guidelines, then and currently. Four soil samples collected from 1-foot below ground surface (bgs) were analyzed for Title 22 metals. Arsenic was reported at a maximum concentration of 4.35 mg/kg, which is below the peak background concentration for southern California soil of 12 mg/kg and was determined not to be of concern to regulatory agencies. Zinc and lead were detected at maximum concentrations of 1,100 and 421 mg/kg, respectively. The peak zinc concentrations are above typical background concentrations, but below residential use screening criteria. The reported lead concentrations exceed typical background concentrations and residential use screening criteria. Based on these results SCS recommended no further investigation with respect to the TPH and VOC detections and/or if the site was to be developed commercially or industrially. However, if soil was to be removed from the site additional waste characterization was recommended to determine disposal options.

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-13 of the property identified as Northwest Block – Atlantic and South – APNs 7125-033-900 through -923, City of Long Beach, County of Los Angeles, California, the Property. Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed the following evidence of recognized environmental conditions (RECs) in connection with the Property:

- **Former Auto Service and Gas Station.** Although SCS conducted a previous Phase II ESA in 2005 to evaluate the former auto service and gas station, the provided site map did not indicate the potential location of the UST removed from this property in circa 1955. Additionally, regulatory criteria have become more stringent regarding soil vapor concentrations for residential development since the work was completed by SCS. Stantec recommends conducting a supplemental soil and soil vapor investigation to confirm the previous findings. Additionally, Stantec recommends performing a geophysical survey at this Property address in an attempt to identify the location of the previous underground storage tanks associated with the service station.

- **Capped Pipes.** In December 2004, TEM observed a capped metal pipe at 5843 Atlantic Avenue and several capped metal pipes in the sidewalk south of the 5887 Atlantic Avenue site and could not determine the origin or use of the pipes. The surrounding area historically consisted of gas stations, auto repair, and a cleaners. Stantec recommends conducting a geophysical survey to determine if the pipes are connected to any underground feature that may be a potential source of impact to the soil.

- **Lead-Impacted Soil.** Based on the lead concentrations detected in the October 2005 Phase II ESA conducted by SCS, lead concentrations in soil exceed residential regulatory criteria. Stantec recommends performing additional soil sampling to determine the vertical and lateral extent of the lead impacts to soil at the Property.

- **Historical Clothes Cleaner/Tailor.** No previous subsurface assessment of the clothes cleaner/tailor historically located at 5823 Atlantic Avenue has been conducted. Stantec recommends collecting soil vapor samples to determine if there is any impact to the subsurface that may be hazardous to human health or the environment.

- **Historical Soil Vapor Data:** Although soil vapor data was collected at the Property address of 5801 Atlantic Avenue by SCS in 2005, the reporting limit of 1 ug/L is well above present-day residential screening criteria. Therefore, Stantec recommends performing a soil vapor survey across the Property to evaluate present-day soil vapor conditions.

The preceding summary is intended for informational purposes only. Reading of the full body of this report is recommended.

2.0 INTRODUCTION

The objective of this Phase I ESA was to perform All Appropriate Inquiry (AAI) into the past ownership and uses of the Property consistent with good commercial or customary practice as outlined by the ASTM in "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process", Designation E1527-13. "All Appropriate Inquiry" (AAI) is the process for evaluating a property's environmental conditions for the purpose of qualifying for landowner liability protections under CERCLA. following final rule of Part 312 of Title 40, Code of Federal Regulations (40 CFR Part 312). The purpose of this Phase I ESA was to identify, to the extent feasible, adverse environmental conditions including recognized environmental conditions ("RECs") of the Property.

The ASTM E1527-13 standard indicates that the purpose of the Phase I ESA is to identify RECs, including historical recognized environmental conditions ("HRECs"), and controlled recognized environmental conditions ("CRECs") that may exist at a property. The term "recognized environmental conditions" means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property:

1. Due to any release to the environment.
2. Under conditions indicative of a release to the environment; or
3. Under conditions that pose a material threat of a future release to the environment.

ASTM defines a "HREC" as a REC that has occurred in connection with a property, but has been addressed to the satisfaction of the applicable regulatory authority and meets current unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (e.g., property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a HREC, the environmental professional (EP) must determine whether the past release is a REC when the current Phase I ESA is conducted (e.g., if there has been a change in the regulations). If the EP considers the past release to be a REC at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a REC.

ASTM defines a "CREC" as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (e.g., as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), but with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (e.g., property use restrictions, activity and use limitations, institutional controls, or engineering controls).

As defined by ASTM, RECs can include hazardous substances or petroleum products present under conditions in compliance with laws if that presence represents a material threat of future release. The presence of hazardous substances or petroleum products is, however, not a REC if that presence is a *de minimis* condition. De minimis conditions are minor occurrences of contamination that generally do not present a material risk to human health and would not likely be subject to enforcement action if brought to the attention of governmental agencies.

The work was performed in accordance with terms and conditions master environment consulting service agreement between Brandywine Homes and Stantec and the work order dated September 2, 2020. The scope of work conducted during this Phase I ESA consisted of a visual reconnaissance of the Property, interviews with key individuals, and review of reasonably ascertainable documents. The scope of work did not include an assessment for environmental regulatory compliance of any facility ever operated at the Property (past or present), or sampling and analyzing of environmental media. Stantec was not contracted to perform an independent evaluation of the purchase or lease price of the Property and its relationship to current fair market value. The conclusions presented in this Phase I ESA report are professional opinions based on data described herein. The opinions are subject to the limitations described in Section 2.3.

ASTM E1527-13 notes that the availability of record information varies from source to source. The User or Environmental Professional is not obligated to identify, obtain, or review every possible source that might exist with respect to a property. Instead, ASTM identifies record information that is reasonably ascertainable from standard sources. “Reasonably ascertainable” means:

1. Information that is publicly available.
2. Information that is obtainable from its source within reasonable time and cost constraints; and
3. Information that is practicably reviewable.

2.1 PROPERTY DESCRIPTION

The Property consists of approximately 3.2 acres of vacant land bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south, and Linden Avenue to the west. An asphalt parking lot is located in the southern portion of the Property. The surrounding area consists of residential structures, a library, and various restaurants, retail, and salons. A Property location map is illustrated on Figure 1. A Property map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the site reconnaissance visit are provided in Appendix A.

The Property Owner is identified as the City of Long Beach.

2.2 SPECIAL TERMS, CONDITIONS, AND SIGNIFICANT ASSUMPTIONS

There were no special terms, conditions, or significant assumptions associated with this Phase I ESA.

2.3 EXCEPTIONS AND LIMITING CONDITIONS

This report documents work that was performed in accordance with the MSA. No other representations, warranties, or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential and actual liabilities and conditions associated with the Property.

This report provides an evaluation of selected environmental conditions associated with the Property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available, and the results of the work. They are not a certification of the property's environmental condition.

This report relates solely to the specific project for which Stantec was retained and the stated purpose for which this report was prepared and shall not be used or relied upon by client for any variation or extension of this project, any other project, or any other purpose.

This report has been prepared for the exclusive use of the client identified herein and any use of or reliance on this report by any third party is prohibited, except as may be consented to in writing by Stantec or as required by law. The provision of any such consent is at Stantec's sole and unfettered discretion and will only be authorized pursuant to the conditions of Stantec's standard form reliance letter. Stantec assumes no responsibility for losses, damages, liabilities, or claims, howsoever arising, from third party use of this report.

Project Specific limiting conditions are provided in Section 2.2.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures, are not guaranteed. Before starting site work, the exact location of all such utilities and structures must be confirmed by the client and the party performing the work, and Stantec assumes no liability resulting from damage to such utilities and structures.

As the purpose of this report is to identify Property conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the Property is beyond the scope of this assessment.

The findings, observations, and conclusions expressed by Stantec in this report are not an opinion concerning the compliance of any past or present owner or operator of the Property which is the subject of this report with any Federal, state, provincial or local law or regulation.

This report presents professional opinions and findings of a scientific and technical nature. It does not and shall not be construed to offer a legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of Federal, state, provincial or local governmental agencies. It is recommended that issues raised by the report should be reviewed for the client by its legal counsel.

Stantec specifically disclaims any responsibility to update the conclusions in this report if new or different information later becomes available or if the conditions or activities on the property subsequently change.

In the event of any conflict between the terms and conditions of this report and the terms and conditions of the MSA, the MSA shall control.

2.4 PERSONNEL QUALIFICATIONS

This Phase I ESA was conducted by, or under the supervision of, an individual that meets the ASTM definition of an Environmental Professional (EP). The credentials of the EP and other key Stantec personnel involved in conducting this Phase I ESA are provided in Appendix B.

3.0 USER-PROVIDED INFORMATION

ASTM E1527-13 describes responsibilities of the User to complete certain tasks in connection with the performance of “All Appropriate Inquiries” into the Property. The ASTM standard requires that the Environmental Professional request information from the User on the results of those tasks because that information can assist in the identification of RECs, CRECs, HRECs, or de minimis conditions in connection with the Property. Towards that end, Stantec requested that the User provide the following documents and information:

Description of Information	Provided (Yes / No)	Description and/or Key Findings
User Questionnaire and/or Interview	Yes	The User is not aware of any environmental concerns regarding the Property.
Environmental Liens or Activity Use Limitations	N/A	No environmental liens and/or activity use limitations were identified in the Preliminary Title Report prepared by First American Title Company dated July 29, 2020 for APNs 7125-033-031 through 054.
Previous Environmental Permits or Reports Provided by User	Yes	Previous reports are summarized in Section 4.4.6.
Purpose of the Phase I ESA	Yes	Due diligence.

Stantec forwarded the ASTM recommended User Questionnaire to Mr. Kye Evans, Vice President of Brandywine Homes. The completed User Questionnaire returned to us by Mr. Evans is included in Appendix C. The significant information provided by Mr. Evans is summarized below.

1. Information on Environmental Cleanup Liens on the Property? – The Client is not aware of any environmental cleanup liens on the Property.
2. Information on Property Activity or Use Limitations (including Institutional and Engineering Controls)? – The Client is not aware of any activity and land use limitations on the Property.
3. Specialized knowledge or experience of the User - The Client does not have any specialize knowledge or experience regarding the Property.
4. Commonly known or reasonably ascertainable information about the Property? - The User provided previous reports for the Property. These reports are summarized in Section 4.4.6.
5. The degree of obviousness or the presence or likely presence of contamination at the Property, and the ability to detect the contamination by appropriate investigation? - The Client provided no information indicating any obvious or likely present contamination.

4.0 RECORDS REVIEW

The objective of consulting historical sources of information is to develop the history of the Property and surrounding area and evaluate if past uses may have resulted in RECs. Physical setting records are evaluated to determine if the physical setting may have contributed to adverse environmental conditions in connection with the Property. During the review of historical records, Stantec attempted to identify uses of the Property from the present to the first developed use of the Property. Stantec's research included the reasonably ascertainable and useful records described in this section.

4.1 PHYSICAL SETTING

A summary of the physical setting of the Property is provided in the table below with additional details in the following subsections:

Topography:	The Property is relatively flat with an elevation of approximately 51 feet above mean sea level (amsl). The regional topographic gradient to the south-southwest (EDR,2020).
Soil/Bedrock Data:	The subsurface in the vicinity of the Property is described as primarily silts and clays to a depth of 40 feet below ground surface (bgs) (Geotracker, 2020).
Estimated Depth to Groundwater/ Estimated Direction of Gradient:	According to the Second Quarter 2020 Groundwater Monitoring Report for the 76 Station 1112 located at 5740 Atlantic Avenue, Long Beach, California which is located adjacent to the southeast, the depth to groundwater was reported between 33 and 41 feet below top of casing and the groundwater flow direction is to the southwest.
NOTE: Site-specific groundwater flow direction and depth can only be determined by conducting site-specific testing, which Stantec has not conducted.	

4.1.1 Property Topography and Surface Water Flow

The Property is relatively flat with an elevation of approximately 51 feet above mean sea level (amsl). The regional topographic gradient to the south-southwest (EDR,2020). Based on the topography, surface water on the Property infiltrates the ground surface or flows overland into the curb and gutter stormwater system along the streets.

The Los Angeles River is located approximately 1/2 mile to the west.

4.1.2 Regional and Property Geology

According to the Additional Site Assessment Report for the 76 Station 1112 located at 5740 Atlantic Avenue, Long Beach, California dated September 21, 2007 prepared by Delta Consultants, the subsurface correspond with the Lakewood Formation and primarily consist with silts and clays to a depth of approximately 40 feet below ground surface (bgs).

4.1.3 Regional and Property Hydrogeology

The Property is located within the southern portion of the Coastal Plain of Los Angeles - Central Subbasin (4-011.04) is bounded on the north by a surface divide called the La Brea high; and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. The southeast boundary between the Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift (Department of Water Resources [DWR], 2004).

According to the Second Quarter 2020 Groundwater Monitoring Report for the 76 Station 1112 located at 5740 Atlantic Avenue, Long Beach, California which is located adjacent to the southeast, the depth to groundwater was reported between 33 and 41 feet below top of casing and the groundwater flow direction is to the southwest.

4.2 FEDERAL, STATE AND TRIBAL ENVIRONMENTAL RECORDS

A regulatory agency database search report was obtained from Environmental Data Resources (EDR), a third-party environmental database search firm. A complete copy of the database search report, including the date the report was prepared, the date the information was last updated, and the definition of databases searched, is provided in Appendix D.

Stantec evaluated the information listed within the database relative to potential impact to the Property, assessing the potential for impacts based in part on the physical setting. As part of this process, inferences have been made regarding the likely groundwater flow direction at or near the Property. As described in 4.1.3, the inferred shallow groundwater flow direction is likely to be in the southwest direction. Observations about the Property and surrounding properties made during the Property reconnaissance are provided in more detail in Section 5.

4.2.1 Listings for Property

The Property addresses were identified in the following environmental databases:

Listed Facility Name/Address	Database Listing	Distance/Direction from Property	REC? (YES / NO)
Dingle A C 5801 Atlantic Avenue Long Beach, CA	UST; EDR Hist Auto	Subject Property	Yes
The Property address was identified in the underground storage tank (UST) database with no additional information regarding this listing was provided by EDR or available online. The Property address was listed as various gasoline and auto service stations between 1931 and 1952. Previous subsurface investigations for the historical gasoline and auto services stations are described in Section 4.4.6.			

Listed Facility Name/Address	Database Listing	Distance/Direction from Property	REC? (YES / NO)
Long Beach Redevelopment Agency 5801 Atlantic Avenue Long Beach, CA	HWTS	Subject Property	Yes
The Property address was identified in the Hazardous Waste Transporter (HWTS) database with the Long Beach Redevelopment Agency as the owner. Given there are no violations or evidence of release this listing is not considered an environmental concern to the Property.			
Beyer Paul 5885 Atlantic Avenue Long Beach, CA	EDR Hist Auto	Subject Property	Yes
The Property was identified as a gasoline service station in 1939 with no additional information regarding this listing was provided by EDR or available online. Previous subsurface investigations for the historical gasoline and auto services stations are described in Section 4.4.6.			
N L B Cleaners 5823 Atlantic Avenue Long Beach, CA	EDR Hist Cleaner	Subject Property	Yes
The Property was identified as various cleaners/dyers between 1948 and 1952 with no additional information regarding this listing was provided by EDR or available online. No previous assessment of the cleaner/dyer has been conducted and no documentation regarding the activities conducted on-site were available for review. Therefore, Stantec considers the historical occupancy of the Property and lack of soil vapor assessment to be considered a REC to the Property.			

4.2.2 Listings for Nearby Sites with Potential to Impact Property

Stantec assessed data presented in the environmental agency database search report to evaluate the potential for conditions on adjacent and nearby sites to pose a REC, CREC, or HREC for the Property. The evaluation included an opinion of the potential for contamination by hazardous substances or petroleum products to migrate to the Property from a nearby property, including by vapor migration or encroachment (i.e., potential for a vapor encroachment condition [VEC].

Listed Facility Name/Address	Database Listing	Distance/Direction from Property	REC? (YES / NO)
Various Automobile Repair Facilities South Street and Atlantic Avenue Long Beach, CA	EDR Hist Auto	Within 1/8 Mile	No
Multiple automobile repairing facilities were listed within 1/8 mile of the Property on South Street and Atlantic. Given none of the listing facilities are adjoining and do not have any indication of a release, these facilities are not considered an environmental concern.			
South Liquor Jr Market / Hammond Joe Garage 494 South Street Long Beach, CA	SWEEPS UST; CA FID UST; EDR HIST AUTO; LUST; CORTESE; HIST CORTESE; CERS; HIST UST	Approximately 163 feet to the south-southwest	No

<table>
<tr><th>Listed Facility Name/Address</th><th>Database Listing</th><th>Distance/Direction from Property</th><th>REC? (YES / NO)</th></tr>
<tr><td colspan="4">The facility is listed as various automotive repair facilities between 1939 and 1972 with two 9,980-gallon fuel USTs. The facility received closure on July 25, 1996 from the Los Angeles Regional Water Quality Control Board (RWQCB) for a release of gasoline. No additional information was provided by EDR or available online. Given the regulatory status and the facility is not adjoining, this facility is not considered an environmental concern to the Property.</td></tr>
<tr><td>Gibson Shell Service / Parts USA / Sears Savings Bank / Former Shell
5800 Atlantic Avenue
Long Beach, CA 9075</td><td>EDR Hist Auto; UST; LUST; Cortese; HIST CORTESE; CERS</td><td>Approximately 166 feet to the southeast</td><td>No</td></tr>
<tr><td colspan="4">The facility is listed as various gasoline service stations and general automotive repair shops between 1976 and 2004. The facility received closure for a gasoline release from the RWQCB on July 18, 1996. No additional information was provided by EDR or available online. Given the regulatory status and the facility is not adjoining, this facility is not considered an environmental concern to the Property.</td></tr>
<tr><td>Autozone #5455
5800 Atlantic Avenue
Long Beach, CA 90805</td><td>RCRA NonGen/NLR; CERS HAZ WASTE; CERS; HWTS</td><td>Approximately 166 feet to the southeast</td><td>No</td></tr>
<tr><td colspan="4">The facility is listed as disposing of various hazardous wastes including unspecified solvent mixtures, latex waste, and unspecified oil-containing waste, and latex waste. Minor violations were noted for lead acid battery management and administration issues. All violations were corrected. Given there are no violations or evidence of release this listing is not considered an environmental concern to the Property.</td></tr>
<tr><td>Unocal 76 #1112 / Service Station 1112 / Tosco 76 Station #1112; Atlantic Gas and Mart
5740 Atlantic Avenue
Long Beach, CA 90805</td><td>SWEEPS UST; HIST UST; CA FID UST; UST; HIST UST; LUST; Cortese; EDR Hist Auto; UST; CERS HAZ WASTE; CERS TANKS; ENF; HIST CORTESE; WDR; CIWQS; CERS; RCRA NonGen/NLR</td><td>Approximately 256 feet to the south-southeast</td><td>No</td></tr>
<tr><td colspan="4">The facility is listed as various gasoline service stations between 1972 and 2014. According to the Conceptual Site Model and Low-Threat Closure Request dated December 24, 2013 prepared by Arcadis, the facility is an active gasoline service station with two gasoline USTs and two sets of dispenser islands. Investigations of potential petroleum hydrocarbon impacts at the facility began in 1985 and site impacts have been characterized. Remedial actions have included soil excavation, soil vapor extraction, air sparging, and ozone sparging. The facility has on-going remediation. Remaining groundwater constituents of potential concern include total petroleum hydrocarbons as gasoline (TPHg); total petroleum hydrocarbons as diesel (TPHd); benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl-tertiary-butyl ether (MTBE); tertiary-butyl alcohol (TBA); and 1,2-dichloroethane (EDC). Soil and groundwater impacts likely originated from leaks from the former USTs, product lines, and/or dispenser islands.

According to the Second Quarter 2002 Groundwater Monitoring Report, 12 monitoring wells were gauged and sampled. MTBE and TBA concentrations in groundwater are the main contaminants of concern with maximum concentrations of 1,700 micrograms per liter (ug/L) and 11,000 ug/L, respectively. However,</td></tr>
</table>

Listed Facility Name/Address	Database Listing	Distance/Direction from Property	REC? (YES / NO)
iso-concentration contours show the impacts not extending to the northwest beyond the intersection of South Street and Atlantic Avenue. No data exist on the Property to confirm that the plume has not migrated on the Subject Property. However, given the facility is not adjoining and the groundwater flow direction is to the southwest, this facility is unlikely to represent an environmental concern to the Property.			

The remaining listings in the database search report provided in Appendix D do not constitute a REC for the Property.

4.3 LOCAL/REGIONAL ENVIRONMENTAL RECORDS

Stantec checked the following sources to obtain information pertaining to Property use and/or indications of RECs in connection with the Property:

4.3.1 California Geologic Energy Management (CalGEM)

Agency Name Contact Information	Finding
California Geologic Energy Management (CalGEM) Division 5816 Corporate Avenue, Suite 200 Cypress, CA 90630 Online database: https://maps.conservation.ca.gov/doggr/wellfinder/#/-118.94276/37.12009/6 Date of contact: September 3, 2020	According to the Well Finder map located on the CalGEM website, there are no oil wells within the Property boundaries. The nearest well is a plugged dry hole located approximately 1,400 feet to the northeast (API 0403705284).

4.3.2 Department of Toxic Substances Control

Agency Name Contact Information	Finding
Department of Toxic Substances Control (DTSC) 5796 Corporate Avenue Cypress, CA 90630 Online database: https://www.envirostor.dtsc.ca.gov/public/ Date of contact: September 3, 2020	Stantec researched the online database Envirostor managed by this agency. No records were found on the database website for the Property addresses or adjacent properties.

4.3.3 California Regional Water Quality Control Board (CRWQCB)

Agency Name, Contact Information	Findings
California State Water Resources Control Board, Los Angeles (RWQCB) 320 West 4th Street, Suite 200 Los Angeles, CA 90013 (213) 576-6600 Online database: https://www.envirostor.dtsc.ca.gov/public/ Date of contact: September 3, 2020	Stantec searched the RWQCB's online database Geotracker for available documents for the Property addresses. No records were found for the Property addresses.

4.3.4 Los Angeles County Department of Public Works

Agency Name Contact Information	Finding
Los Angeles County Department of Public Works (DPW), Solid Waste Information Management System (SWIMS) Online database: https://dpw.lacounty.gov/epd/swims/OnlineServices/search-methane-hazards-esri.aspx Date of contact: September 3, 2020	According to the Los Angeles County Department of Public Works, Solid Waste Information Management System online database, the Property is not located within 300 feet of an oil well or 1,000-feet of a methane producing site.

4.3.5 Local Building and/or Planning Department Records

Agency Name Contact Information	Finding
City of Long Beach Building Department 411 West Ocean Boulevard Long Beach, California Date of contact: September 3, 2020 Online database: https://longbeachca.govqa.us	On September 2, 2020, Stantec requested available records for the Property addresses from the City of Long Beach Building Department from the online database. At the time of the preparation of this report no response has been received. Should any pertinent information become available an addendum to this report will be issued.

4.3.6 Fire Department

Agency Name Contact Information	Finding
Los Angeles County Fire Department Hazardous Materials Division 1320 N. Eastern Avenue Los Angeles, CA 90063	According to multiple emails dated September 3, 2020 from the Los Angeles County Fire Department, there are no records for the Property addresses.

Agency Name Contact Information	Finding
(323) 881-2411	

4.4 HISTORICAL RECORDS REVIEW

4.4.1 Land Title Records/Deeds

No environmental liens and/or activity use limitations were identified in the Preliminary Title Report prepared by First American Title Company dated July 29, 2020 for APNs 7125-033-031 through 054.

Additionally, Stantec identified no evidence of environmental liens, activity and use limitations, institutional controls, land use restrictions or engineering control requirements in its review of the EDR Radius Map Report, information obtained from the User and other EDR-provided information.

4.4.2 Aerial Photographs

Stantec reviewed historical aerial photographs provided by EDR. The general type of activity on a property and land use changes can often be discerned from the type and layout of structures visible in the photographs. However, specific elements of a facility's operation usually cannot be discerned from aerial photographs alone. The following table summarizes Stantec's observations of the reviewed historical aerial photographs.

Year	Scale	Observations, Property and Adjoining Properties
1928	1" = 500'	The center of the Property appears to be developed with multiple small residential structures. A small gas station appears in the southeastern corner of the Property. Developed roads appear along the perimeter of the Property. Vacant land and small residential structures appear in the surrounding area.
1938	1" = 500'	The Property and surrounding area appear similar to the previous photographs. Additional residential structures appear in the norther portion of the Property. A gas station appears to the southeast beyond the intersection. Additional commercial development appears to the south.
1947	1" = 500'	The Property appears similar to the previous photograph; however, the quality of the photograph is too poor to discern detail. An increase in residential development appears in the surrounding area. Commercial development appears to the east and south.
1954	1" = 500'	The western and southern portions of the Property appear to be developed with commercial properties. Residential properties appear on the eastern portion of the Property. Commercial development appears to the east along Atlantic Avenue. Dense residential development appears to the west.
1963 1972	1" = 500'	The Property and surrounding area appear similar to the previous photograph. A large warehouse building appears in the southeast corner where the gas station was previously located.

Year	Scale	Observations, Property and Adjoining Properties
1977 1981 1989 1994 2002 2005	1" = 500'	The Property and surrounding area appear similar to the previous photograph. An asphalt parking lot appear around the warehouse building in the southeast corner of the Property.
2009 2012 2016	1" = 500'	All of the structures have been demolished and the Property appears vacant. Asphalt remains in the southern portion of the Property. The surrounding area appears similar to the previous photographs. A library appears to the east beyond Atlantic Avenue in the 2016 aerial photograph.

Name of aerial photograph source: EDR, 2020

4.4.3 City Directories

Stantec retained a third party (EDR) to research available reverse city directories for the Property, in approximately five-year intervals. The following is a summary of Stantec's review of the city directory listings:

Subject/Adjoining Property	Year	Listed Occupants
Subject Property: 501 East South Street	2004	Babies Nutritional Center
Subject Property: 501 East South Street	1969	Bacher Signs of California; Jo Jos Beauty Salon
Subject Property: 5893 Atlantic Avenue	--	No listings
Subject Property: 5801 Atlantic Avenue	2009-1963	Various Banks
Subject Property: 5801 Atlantic Avenue	1952-1931	Auto Repair and Gas Station
Subject Property: 5887 Atlantic Avenue	2004-1952	Various Dentists/Docs
Subject Property: 5879 Atlantic Avenue	2000-1944	Residential
Subject Property: 5855 Atlantic Avenue	2009-1931	Residential
Subject Property: 5855 Atlantic Avenue	1969	Chiropractor
Subject Property: 5855 Atlantic Avenue	1952	Helens House of Beauty

Subject/Adjoining Property	Year	Listed Occupants
Subject Property: 5845 Atlantic Avenue	2000 - 1931	Residential
Subject Property: 5845 Atlantic Avenue	1999	Video to Go
Subject Property: 5845 Atlantic Avenue	1980-1975	Shaklee Basic H Distributor
Subject Property: 5845 Atlantic Avenue	1967-1952	Insurance Agency
Subject Property: 5835 Atlantic Avenue	2004-2000	Residential
Subject Property: 5835 Atlantic Avenue	1991	Adventure Printing
Subject Property: 5835 Atlantic Avenue	1975-1980	Davlins TV & Appliance
Subject Property: 5835 Atlantic Avenue	1952 – 1969	Various Clothing Retail
Subject Property: 5827 Atlantic Avenue	2000	Residential
Subject Property: 5827 Atlantic Avenue	1957-1952	Shoe Repair
Subject Property: 5823 Atlantic Avenue	2014-1999	Residential
Subject Property: 5823 Atlantic Avenue	2009-1963	The Stallion / Black Stallion Tavern
Subject Property: 5823 Atlantic Avenue	1948 - 1952	N L B Cleaners / Small Mrs Do Cleaner
Subject Property: 5823 Atlantic Avenue	1944	Young H A
Subject Property: 5826 Linden Avenue	2014-1935	Various Residential
Subject Property: 5836 Linden Avenue	2014-1957	Various Residential
Subject Property: 5844 Linden Avenue	2004-1969	Various Residential
Subject Property: 5850 Linden Avenue	2006-1935	Various Residential
Subject Property:	2009-1952	Various Residential

Subject/Adjoining Property	Year	Listed Occupants
5852 Linden Avenue		
Subject Property: 5860 Linden Avenue	2006-1952	Various Residential
Subject Property: 5866 Linden Avenue	2006-1944	Various Residential
Subject Property: 5874 Linden Avenue	2004-1944	Various Residential
Subject Property: 5878 Linden Avenue	2006-1935	Various Residential
Subject Property: 5886 Linden Avenue	2014-1999	Various Residential

Name of city directories and source: EDR, 2020

4.4.4 Historical Fire Insurance Maps

Fire insurance maps were developed for use by insurance companies to depict facilities, properties, and their uses for many locations throughout the United States. These maps provide information on the history of prior land use and are useful in assessing whether there may be potential environmental contamination on or near the Property. These maps, which have been periodically updated since the late 19th century, often provide valuable insight into historical Property uses.

Stantec contracted with a third party to search for copies of historical fire insurance maps covering the subject and immediately adjacent properties. Two maps were provided from the years 1950 and 1963.

The 1950 map shows most of the Property along Linden Avenue to be developed with dwellings. Offices and shops are depicted on the eastern portion of the Property along Atlantic Avenue. Auto repair building are depicted on the southern portion of the Property along South Street with a gas and oil station located in the southwestern corner. Additional off-site gas and oil stations are located to the southwest and southeast beyond Linden Avenue and Atlantic Avenue, respectively.

The 1963 map is similar to the 1950 map; however, the gas and oil station in the southwestern corner of the Property has been replaced with a bank and parking lot.

The Sanborn® Map Search Report is presented in Appendix E.

4.4.5 Historical Topographic Maps

Stantec reviewed historical USGS 7.5-minute Topographic Maps of the South Gate, Long Beach, and Downey, California, Quadrangles (scale 1:24,000, 1:20,000, 1:62,500) to help identify past Property usage and areas of potential environmental concern. Copies of the historical maps are provided in Appendix E. The following table summarizes the maps reviewed and our observations.

Year	Scale	Observations, Property and Adjoining Properties
1896; 1899; and 1902	1:62,500	No site details are depicted on the Property. No development appears in the surrounding area. The Los Angeles River appears to the west. The San Pedro railroad appears to the east.
1924/1925	1:24,000	Roads appear along the perimeter of the Property. A small structure appears in the northwest corner. Small structures appear in the surrounding area.
1942; 1943; 1947; 1949; 1964; 1972; and 1981	1:62,500 1:50,000 1:24,000	The Property appears to be located in an urban area with no details depicted. Atlantic Boulevard appears adjacent to the east.
2012	1:24,000	Only road improvements being depicted. Roads appear in the current configuration.

Name of maps and source: EDR, 2020

4.4.6 Other Historical Sources

The user provided Stantec will the following previous report prepared for the Property.

Phase I Environmental Assessment, Northwest Block – Atlantic and South, APNs 7125-033-900 through -923, Long Beach, California 90805 prepared by SCS Engineers, dated May 2009.

The Phase I ESA prepared by SCS Engineers (SCS) included a review of seven Phase I ESA reports and one Phase II report that were previously completed for portions of the Property:

- SCS Engineers. Phase I Environmental Assessment, North Library Site- Alternative D, Long Beach, California (APNs 7125-033-008 through –013, -022 through –025, and –030). File Number 01202132.00. October 17, 2002.
- SCS Engineers. Phase I Environmental Assessment, 5893 Atlantic Avenue (APN 7125-033-016). Long Beach, California. File Number 01204033.00. May 27, 2004.
- Tait Environmental Management, Inc. (TEM) Phase I Environmental Assessment, 5843/5845/5847 Atlantic Avenue, Long Beach, California 90805. Project Number EM 2585. December 17, 2004.
- Tait Environmental Management, Inc. Phase I Environmental Assessment, 5887 Atlantic Avenue, Long Beach, California 90805. Project Number EM 2585. December 17, 2004.
- SCS Engineers. Phase I Environmental Assessment, 5855 Atlantic Avenue, Long Beach, California (APN 7125-033-021). File Number 01204913.00. April 13, 2005a.
- SCS Engineers. Draft Phase II Investigation Report, 5801 Atlantic Avenue, Long Beach, California (APN 7125-033-030). File Number 01205195.00. October 28, 2005b.
- SCS Engineers. Phase I Environmental Assessment, 5852-5892 Linden Avenue, Long Beach, California (APN 7125-033-001 through 007). File Number 01205202.00. October 31, 2005c.
- SCS Engineers. Phase I Environmental Assessment, 5879 Atlantic Avenue, Long Beach, California 90805 (APN 7125-033-018). File Number 01206087.00. July 2006

There reports were not provided to Stantec for review. Pertinent information from the report summaries completed by SCS is provided below.

In December 2004, Tait Environmental Management, Inc (TEM) observed a capped metal pipe at 5843 Atlantic Avenue and several capped metal pipes in the sidewalk south of the 5887 Atlantic Avenue site and could not determine the origin or use of the pipes. The surrounding area historically consisted of gas stations, auto repair, and a cleaners. TEM determined additional investigation of the pipes to determine if it was associated with an underground storage tank.

In October 2005 SCS conducted a Phase II ESA at the 5801 Atlantic Avenue Property to evaluate the former service station and auto body repair activities. Four soil vapor samples (SV1 through SV4) were collected from 5 feet below ground surface (bgs) and analyzed for volatile organic compounds (VOCs). No VOCs were detected above the laboratory reporting limit of 1 microgram per liter (ug/L) in any of the soil vapor samples collected. Seven soil borings were advanced to 20 feet bgs and select soil samples were analyzed for VOCs, total petroleum hydrocarbons (TPH), and Title 22 metals. Of the 19 soil samples analyzed, one (B2-10’) contained benzene and toluene at concentrations of 11.4 and 10.3 micrograms per kilogram (ug/kg), respectively. Of the 19 soil samples analyzed, three contained TPH-diesel and TPH-oil at concentrations of 27.9 and 256 milligrams per kilogram (mg/kg), respectively. Concentrations were below regulatory guidelines. Four soil samples collected from 1-foot bgs were analyzed for Title 22 metals. Arsenic was reported at a maximum concentration of 4.35 mg/kg which is below background concentrations (8 to 12 mg/kg) and was determined not to be of concern to regulatory agencies. Zinc and lead were detected at maximum concentrations of 1,100 and 421 mg/kg. The peak zinc concentrations are above typical background concentrations, but below residential use screening criteria. The reported lead concentrations exceed typical background concentrations and residential use screening criteria. Based on these results SCS recommended no further investigation with respect to the TPH and VOC detections and/or if the site was to be developed commercially or industrially. However, if soil was to be removed from the site additional waste characterization was recommended to determine disposal options.

SCS identified the following RECs: former auto repair facilities at 509 and 521 South Street since they were not previously investigated; the “clothes cleaner” at 5823 Atlantic Avenue since there has been no direct assessment; and elevated lead concentrations at 5801 Atlantic Avenue which have not been laterally or vertically delineated. SCS recommended further investigation to assess the nature and extent of known or suspected chemicals of potential concern.

5.0 SITE RECONNAISSANCE

A visit to the Property and its vicinity was conducted by Mr. Joshua Sargent, Project Geologist with Stantec on September 10, 2020. Stantec was unaccompanied during the site reconnaissance. Figure 2 provides information about the Property and adjoining properties and the location of potential areas of environmental concern. Photographs collected during the Property visit are included in Appendix A.

5.1 SITE RECONNAISSANCE METHODOLOGY

The site reconnaissance focused on observation of current conditions and observable indications of past uses and conditions of the Property that may indicate the presence of RECs. The reconnaissance of the Property was conducted on foot and Stantec utilized the following methodology to observe the Property:

- Traverse the outer Property boundary.
- Traverse transects across the Property.

Weather conditions during the visit to the Property were cool and cloudy. There were no weather-related Property access restrictions encountered during the reconnaissance visit.

5.2 GENERAL DESCRIPTION

Property and Area Description:	The Property is bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south, and Linden Avenue to the west. The surrounding area consists of residential structures, a library, and various restaurants, retail, and salons.
Property Operations.	Vacant land.
Structures, Roads, Other Improvements:	The Property consists of a vacant lot and an asphalt parking lot is located in the southern portion of the Property.
Property Size (acres):	Approximately 3.2 acres.
Estimated % of Property Covered by Buildings and/or Pavement:	10%
Observed Current Property Use/Operations:	None observed.
Observed Evidence of Past Property Use(s):	None observed.
Sewage Disposal Method (and age):	None observed.
Potable Water Source:	None observed.
Electric Utility:	Southern California Edison.

5.3 HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

The following table summarizes Stantec's observations during the Property reconnaissance.

Observations	Description/Location
Hazardous Substances and Petroleum Products as Defined by CERCLA 42 U.S.C. § 9601(14):	None observed.
Drums (≥ 5 gallons):	None observed.
Strong, Pungent, or Noxious Odors:	None detected.
Pools of Liquid:	None observed.
Unidentified Substance Containers:	None observed.
PCB-Containing Equipment:	Multiple pole-mounted transformers were observed in the central portion of the Property.
Other Observed Evidence of Hazardous Substances or Petroleum Products:	None observed.

5.4 INTERIOR OBSERVATIONS

Given there are no buildings present on the Property this section is not applicable.

5.5 EXTERIOR OBSERVATIONS

Stantec made the following observations during the site reconnaissance of exterior areas of the Property and/or identified the following information during the interview or records review portions of the assessment:

Observations	Description
On-site Pits, Ponds, or Lagoons:	None observed.
Stained Soil or Pavement:	None observed.
Stressed Vegetation:	None observed.
Waste Streams and Waste Collection Areas:	None observed.
Solid Waste Disposal:	No areas indicative of solid waste disposal was observed.
Potential Areas of Fill Placement:	No mounds, piles, or depressions suggesting the placement of fill material were observed on the Property.
Wastewater:	No exterior wastewater discharge was observed.
Stormwater:	No evidence of illegal disposal was observed associated with the storm drains.
Wells:	No wells were observed.

Observations	Description
Septic Systems:	None observed.
Other Exterior Observations:	None.

5.6 UNDERGROUND STORAGE TANKS/STRUCTURES

Existing USTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface patches), reports, or other evidence of the presence of underground storage tanks (USTs) was discovered during this Phase I ESA.
Former USTs:	It is understood that "multiple" USTs were present at the Property address of 5801 Atlantic Avenue, but were removed in circa 1955. However, no visible evidence (fill pipes, vent pipes, dispensers, surface patches), reports, or other evidence of the former presence of USTs was discovered during this Phase I ESA.
Other Underground Structures:	None observed.

5.7 ABOVEGROUND STORAGE TANKS

Existing ASTs:	No visible evidence reports, or other evidence of the presence of aboveground storage tanks (ASTs) was discovered during this Phase I ESA.
Former ASTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface stains), reports, or other evidence of the former presence of ASTs was discovered during this Phase I ESA.

5.8 ADJOINING PROPERTIES

5.8.1 Current Uses of Adjoining Properties

As viewed from the Property and/or from public rights-of-way, Stantec made the following observations about use and activities on adjoining properties:

NORTH	59th Street beyond which are single-family residential structures and a restaurant.
EAST	Atlantic Avenue beyond which is a library and Auto Zone Auto Parts retail store.
SOUTH	South Street beyond which is a multi-tenant building with retail, beauty salons, and pharmacy. A gasoline service station is located to the southeast beyond the intersection.
WEST	Linden Avenue beyond which are single-family residential structures.

5.8.2 Observed Evidence of Past Uses of Adjoining Properties

Observations of adjoining properties providing indications of past use and activities, if any, are described below.

NORTH	None observed.
EAST	None observed.
SOUTH	None observed.
WEST	None observed.

5.8.3 Pits, Ponds or Lagoons on Adjoining Properties

As viewed from the Property and/or from public rights-of-way, Stantec made the following observations about the presence of pits, ponds and lagoons on adjoining properties:

NORTH	None observed.
EAST	None observed.
SOUTH	None observed.
WEST	None observed.

5.9 OBSERVED PHYSICAL SETTING

Topography of the Property and Surrounding Area:	The Property and surrounding area were relatively flat.

6.0 CONCLUSIONS

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-13 of the property identified as Northwest Block – Atlantic and South – APNs 7125-033-900 through -923, City of Long Beach, County of Los Angeles, California, the Property. Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed the following evidence of recognized environmental conditions (RECs) in connection with the Property:

- **Former Auto Service and Gas Station.** Although SCS conducted a previous Phase II ESA in 2005 to evaluate the former auto service and gas station, the provided site map did not indicate the potential location of the UST removed from this property in circa 1955. Additionally, regulatory criteria have become more stringent regarding soil vapor concentrations for residential development since the work was completed by SCS. Stantec recommends conducting a supplemental soil and soil vapor investigation to confirm the previous findings. Additionally, Stantec recommends performing a geophysical survey at this Property address in an attempt to identify the location of the previous underground storage tanks associated with the service station.

- **Capped Pipes.** In December 2004, TEM observed a capped metal pipe at 5843 Atlantic Avenue and several capped metal pipes in the sidewalk south of the 5887 Atlantic Avenue site and could not determine the origin or use of the pipes. The surrounding area historically consisted of gas stations, auto repair, and a cleaners. Stantec recommends conducting a geophysical survey to determine if the pipes are connected to any underground feature that may be a potential source of impact to the soil.

- **Lead-Impacted Soil.** Based on the lead concentrations detected in the October 2005 Phase II ESA conducted by SCS, lead concentrations in soil exceed residential regulatory criteria. Stantec recommends performing additional soil sampling to determine the vertical and lateral extent of the lead impacts to soil at the Property.

- **Historical Clothes Cleaner/Tailor.** No previous subsurface assessment of the clothes cleaner/tailor historically located at 5823 Atlantic Avenue has been conducted. Stantec recommends collecting soil vapor samples to determine if there is any impact to the subsurface that may be hazardous to human health or the environment.

- **Historical Soil Vapor Data:** Although soil vapor data was collected at the Property address of 5801 Atlantic Avenue by SCS in 2005, the reporting limit of 1 ug/L is well above present-day residential screening criteria. Therefore, Stantec recommends performing a soil vapor survey across the Property to evaluate present-day soil vapor conditions.

6.1 DATA GAPS

The federal AAI final rule [40 CFR 312.10(a)] and ASTM E1527-13 identify a “data gap” as the lack or inability to obtain information required by the standards and practices of the rule despite good faith efforts by the Environmental Professional or the User.

Any data gaps resulting from the Phase I ESA described in this report are listed and discussed below.

Gap	Discussion
Deletions or Exceptions from Scope of Work Referenced in Section 1.4:	None.
Weather-Related Restrictions to Site Reconnaissance:	None.
Facility Access Restrictions to Site Reconnaissance:	None.
Other Site Reconnaissance Restrictions:	None.
Data Gaps from Environmental Records Review:	None.
Data Gaps from Historical Records Review:	None.
Data Gaps from Interviews:	Given the Property consists of a vacant lot no on-site interview was performed. However, based historical documentation the lack of an on-site interview is not considered a significant data gap and does not impact the findings for this report.
Other Data Gaps:	Land title records and deeds were not provided by the User, and public records were not searched by Stantec. However, Stantec identified no evidence of environmental liens, activity and use limitations, institutional controls, land use restrictions or engineering control requirements in its review of the EDR Radius Map Report, information obtained from the User and other EDR-provided information.

7.0 NON-SCOPE CONSIDERATIONS

The scope of work completed was limited solely to those items in the ASTM E1527-13 standard. No ASTM E1527-13 non-scope services were performed as part of this Phase I ESA.

7.1 LEAD-BASED PAINT

Concern for lead-based paint (LBP) is primarily related to residential structures. The EPA's Final Rule on Disclosure of Lead-Based Paint in Housing (40 CFR Part 745) defines LBP as paint or other surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight.

The risk of lead toxicity in LBP varies based upon the condition of the paint and the year of its application. The U.S. Department of Housing and Urban Development (HUD) has identified the following risk factors:

- The age of the dwelling as follows: maximum risk is from paint applied before 1950.
- There is severe risk from paint applied before 1960.
- There is moderate risk from deteriorated paint applied before 1970.
- There is slight risk from the paint that is intact but applied before 1977.
- The condition of the painted surfaces.
- The presence of children and certain types of households in the building.
- Previously reported cases of lead poisoning in the building or area.

Given there are no structures on the Property, LBP is not considered an environmental concern to the Property.

7.2 ASBESTOS

Asbestos can be found in many applications, including sprayed-on or blanket-type insulation, pipe wraps, mastics, floor and ceiling tiles, wallboard, mortar, roofing materials, and a variety of other materials commonly used in construction. The greatest asbestos-related human health risks are associated with friable asbestos, which is ACM that can be reduced to powder by hand pressure. Friable asbestos can become airborne and inhaled, which has been associated with specific types of respiratory disease. The manufacturing and use of asbestos in most building products was curtailed during the late 1970s.

Stantec makes no warranty as to the possible existence or absence of inaccessible materials or to their evaluation with respect to asbestos content. Samples of suspect ACM should be collected for laboratory analysis of asbestos prior to any renovation or building demolition to be compliant with, EPA National Emission Standard for Hazardous Air Pollutants (NESHAP) regulations.

Given there are no structures on the Property, ACMs are not considered an environmental concern to the Property.

7.3 RADON

Radon is a colorless, tasteless radioactive gas with an EPA-specified action level of 4.0 PicoCuries per liter of air (pCi/L) for residential properties. Radon gas has a very short half-life of 3.8 days. The health risk potential of radon is primarily associated with its rate of accumulation within confined areas near or in the ground, such as basements, where vapors can readily transfer to indoor air from the ground through foundation cracks or other pathways. Large, adequately ventilated rooms generally present limited risk for radon exposure. The radon concentrations in buildings and homes depend on many factors, including soil types, temperature, barometric pressure, and building construction (EPA, 1993).

Stantec reviewed regional data published by the EPA on average indoor radon concentrations in the vicinity of the Property (http://www.epa.gov/radon/zonemap.html).

<table>
<tr><th colspan="3">EPA Radon Zones (w/Average Measured Indoor Radon concentrations)</th></tr>
<tr><td>Zone 1 – High
(>4.0 pCi/L)</td><td>Zone 2 – Moderate
(2 to 4 pCi/L)</td><td>Zone 3 – Low
(<2 pCi/L)</td></tr>
<tr><td></td><td>X</td><td></td></tr>
<tr><th colspan="3">Normally occupied sub grade areas present? (i.e., basement apartments, offices, stores, etc.)</th></tr>
<tr><td colspan="3">No subgrade areas are located within the Property boundaries.</td></tr>
</table>

The Property is located in Zone 2 and is considered to have moderate potential for radon. None of the 11 tests within Zip code 90805 (the Zip code of the Property) had a detection above 4 pCi/L. To determine Property-specific radon levels, a radon survey would have to be conducted. However, because no subgrade areas are located within the Property boundary, further investigation of indoor radon issues does not appear to be warranted.

7.4 FLOOD ZONES

According to the Physical Setting summary portion of the EDR report, the Property is located within a 0.2% Annual Chance Floor Hazard.

8.0 REFERENCES

American Society for Testing and Materials, 2015, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions, Designation E 2600-15.

American Society for Testing and Materials, 2013, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, Designation: E 1527-13.

Department of Toxic Substances and Control, 2020, website http://www.envirostor.dtsc.ca.gov/public/

Environmental Data Resources, Inc. (EDR), EDR Radius Map with Geocheck, Inquiry Number 6178329.2s, dated September 2, 2020.

_____, Certified Sanborn Map Report, Inquiry Number 6178329.3, dated September 3, 2020.

_____, Historical Topographic Map Report, Inquiry Number 6178329.4, dated September 2, 2020.

_____, Aerial Photo Decade Package, Inquiry Number 6178329.8, dated September 3, 2020.

_____, City Directory Abstract, Inquiry Number 6178329.5, dated September 3, 2020.

State Water Resource Control Board's Geotracker, 2020, website https://geotracker.waterboards.ca.gov/

United States Geological Survey (USGS), 2012, Glendora Quadrangle, 7.5 Minute Topographic Map, Scale 1 inch = 2,000 feet.

United States Geological Survey, 2020, U.S. Quaternary Faults, https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf

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Appendix A Photographs of the Property and Vicinity

Appendix B STANTEC RESUMES

Appendix C   USER PROVIDED RECORDS

Appendix D ENVIRONMENTAL AGENCY DATABASE SEARCH REPORT

Appendix E HISTORICAL RECORDS

Appendix F AGENCY RECORDS

Phase II Environmental Site Assessment

Northwest Block – Atlantic Avenue and South Street
APNs 7125-033-900 through -923
Long Beach, California 90805

November 4, 2020

Prepared for:

Brandywine Homes
16580 Aston
Irvine, California 92606

Prepared by:

Stantec Consulting Services Inc.
735 East Carnegie Drive, Suite 280
San Bernardino, California 92408

Stantec Project Number: 185804904

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Executive Summary

Stantec Consulting Services Inc. (Stantec) has prepared this Phase II Environmental Site Assessment (ESA) report for the property identified as Northwest Block – Atlantic Avenue and South Street, City of Long Beach, County of Los Angeles, California (the "Property", **Figure 1**).

The Property consists of approximately 3.2 acres of vacant land bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south, and Linden Avenue to the west. An asphalt parking lot is located in the southern portion of the Property. The surrounding area consists of residential structures, a library, and various restaurants, retail, and salons. A Property location map is illustrated on **Figure 1**. A Property map illustrating the main features of the Property is provided as **Figure 2**.

According to historical documents, the Property was developed with a service station and battery shop between 1925 and 1950s (5801 and 5803 Atlantic); automotive repair between circa 1933-1968 (509 and 521 South Street); a clothes cleaner/tailor between 1948 and 1953 (5823 Atlantic); and residential and various commercial uses (i.e. churches, office space, retail, and a bank). All structures were demolished in circa 2006 and the Property is currently a vacant lot.

Stantec performed a Phase I ESA for the Property in September 2020. That assessment identified the following recognized environmental conditions (RECs) in connection with the Property:

- **Former Auto Service and Gas Station.** Although SCS conducted a previous Phase II ESA in 2005 to evaluate the former auto service and gas station, the provided site map did not indicate the potential location of the UST removed from this property in circa 1955. Additionally, regulatory criteria have become more stringent regarding soil vapor concentrations for residential development since the work was completed by SCS. Stantec recommended conducting a supplemental soil and soil vapor investigation to confirm the previous findings. Additionally, Stantec recommended performing a geophysical survey at this Property address in an attempt to identify the location of the previous underground storage tanks associated with the service station.

- **Capped Pipes.** In December 2004, TEM observed a capped metal pipe at 5843 Atlantic Avenue and several capped metal pipes in the sidewalk south of the 5887 Atlantic Avenue site and could not determine the origin or use of the pipes. The surrounding area historically consisted of gas stations, auto repair, and a laundry operation. Stantec recommended conducting a geophysical survey to determine if the pipes are connected to any underground feature that may be a potential source of impact to the soil.

- **Lead-Impacted Soil.** Based on the lead concentrations detected in the October 2005 Phase II ESA conducted by SCS, lead concentrations in soil exceed residential regulatory criteria. Stantec recommended performing additional soil sampling to determine the vertical and lateral extent of the lead impacts to soil at the Property.

- **Historical Clothes Cleaner/Tailor.** No previous subsurface assessment of the clothes cleaner/tailor historically located at 5823 Atlantic Avenue has been conducted. Stantec recommended collecting soil vapor samples to determine if there is any impact to the subsurface that may be hazardous to human health or the environment.
- **Historical Soil Vapor Data:** Although soil vapor data was collected at the Property address of 5801 Atlantic Avenue by SCS in 2005, the reporting limit of 1 ug/L is well above present-day residential screening criteria. Therefore, Stantec recommended performing a soil vapor survey across the Property to evaluate present-day soil vapor conditions.

Phase II Investigation

Stantec provided the services of a field geologist on October 16 and 19, 2020 to supervise and direct the advancement of multiple soil and soil vapor borings at the Property. All work was conducted under the direct oversight of a State of California professional and included the following:

- Perform a subsurface geophysical survey in the southern portion of the Property.
- Advancement of nine (9) soil and soil vapor borings (SB-01 through SB-09).
- Advancement of nine (9) hand auger soil borings (HA-01 through HA-09).

Soil borings HA-01 through HA-04, and soil vapor borings SB-01 through SB-04 were advanced in the northern portion of the Property. The remainder of the boreholes were advanced in the southern portion of the Property to investigate the lateral and vertical limits of the previously-identified elevated lead concentrations, and potential impacts from the historical auto repair facility, gas station, former UST, and laundromat facilities. Borings HA-06, HA-08, and HA-09 were advanced in the vicinity of SCS borings B2, B4, and B6, respectively. The table below is provided to summarize soil boring placement and features assessed during this investigation. All boring locations advanced during this investigation are depicted on **Figure 3**.

Feature Assessed	Boring ID	Terminal Depth (feet bgs)	Soil Sampling Depth	Soil Vapor Probe Depth (feet bgs)
Former UST Location	SB-07	15.5	1, 3, 5, 10, 15	5, 15
	SB-08	15.5	1, 3, 5, 10, 15	5, 15
Former Auto Service	SB-05	15.5	1, 3, 5, 10, 15	5, 15
	SB-06	15.5	1, 3, 5, 10, 15	5, 15
	SB-09	15.5	1, 3, 5, 10, 15	5, 15
Elevated Lead Impacts	HA-05	5	1, 3, 5	--
	HA-06	5	1, 3, 5	--
	HA-07	5	1, 3, 5	--
	HA-08	5	1, 3, 5	--
	HA-09	5	1, 3, 5	--

Site-Wide Lead Assessment	HA-01	5	1, 3, 5	--
	HA-02	5	1, 3, 5	--
	HA-03	5	1, 3, 5	--
	HA-04	5	1, 3, 5	--
Site-Wide Soil Vapor and Lead Assessment	SB-01	15.5	1, 3, 5	5, 15
	SB-02	15.5	1, 3, 5	5, 15
	SB-03	15.5	1, 3, 5	5, 15
	SB-04	15.5	1, 3, 5	5, 10

Soils encountered during this assessment consisted largely of silty sand from surface to the maximum explored depth of 15.5 feet bgs. Generally, the northern, unpaved portion of the Property is overlain with approximately one- to four-inches of wood chips and gravel. Minor amounts of gravel were encountered sporadically in this area up to two-feet bgs. Large cobbles were encountered in multiple borings within the paved area in the southern portion of the Property. Refusal was encountered at boring location HA-09 at approximately 1.5 feet bgs due to large cobbles and concrete debris, indicative of fill materials; consequently, no soil samples were retrieved from this location. All PID readings measured 0.0 parts per million by volume (ppmV).

Phase II Results and Conclusions

A geophysical survey was performed in the southern portion of the Property to identify subsurface utilities and investigate the presence of the former on-site USTs. An approximate 10-foot by 10-foot area of disturbed soil was identified in the eastern portion of the paved parking area in the southern portion of the Property. Although the former UST is plotted in the extreme southeastern corner of the Property by a fire insurance map dated 1950, this disturbed area was interpreted as a suspect cavity. Therefore, soil boring SB-07 was advanced within this disturbed soil area, and SB-08 was advanced within the mapped area of the former UST. Soil samples collected within the suspected former UST cavity indicated no impacts of TPH or VOCs to soil. Therefore, Stantec recommends no further investigations regarding the former USTs at the Property.

Various VOCs were detected in soil vapor throughout the Property. Specifically, benzene, chloroform, naphthalene, and tetrachloroethylene (PCE) were detected at concentrations above their respective soil vapor screening levels using an attenuation factor of 0.03. However, none of the chemicals detected in soil vapor exceeded residential risk levels using an attenuation factor of 0.001, currently used by DTSC for assessing risk. Therefore, Stantec concludes that using the current risk-based screening level calculated by using the 0.001 attenuation factor, no soil vapor levels were detected above the residential risk levels. Therefore, Stantec is not recommending further investigations regarding soil vapor conditions at the Property.

Elevated lead concentrations exceeding residential use screening levels of 80 mg/kg have been identified in shallow soils beneath the asphalt-paved parking area in the southern portion of the Property. No samples collected at the three-foot depth interval in this area reported elevated lead concentrations above the 80 mg/kg concentration, indicating that the lead impacts are within the upper 1’ to 2’ of soil. The highest lead detection was in the one-foot soil sample collected from HA-05 at 1210 mg/kg, exceeding the California Hazardous Waste classification for total lead of 1000 mg/kg. Lead solubility analyses indicates that a large portion of the lead impacted soil classify as California Hazardous waste (Non-RCRA). These California hazardous waste areas include, at a minimum, the materials in the vicinity of borings HA-05, HA-06, HA-08, and SB-06. No lead concentrations exceeding residential screening levels have been identified in the northern, unpaved portion of the Property.

The southern portion of the Property has historically been used for various purposes, including automotive repair, service stations, and a laundromat. These structures have been removed, and no buildings currently occupy this area. Some debris was noted in the shallow soils within the southern portion of the Property, including cobbles, and asphalt, brick, and glass fragments. Due to the lead impacts coinciding with the observed debris in shallow soils, it is suspected that undocumented fill material may be present in this area and could be the source of the lead impacts found in this portion of the Property.

With the data collected to date, it appears that the lead impacted soil is present in an area of approximately 22,000 square feet to a depth of approximately two feet. Based on this measurement it is estimated that approximately 1,600 yards (or 2,400 tons using 1.5 tons per cubic yard) of California non-hazardous and California Hazardous Waste is present on the Property. Given the lead impacts are suspected to be sourced from undocumented fill placed at the Property, lead concentrations within this material are inherently heterogenous. Therefore, as a conservative estimate of the total volume, it should be anticipated to remove the entirety of the asphalt-paved parking area to a depth of two feet. This would result in approximately 2,250 yards (or 3,375 tons). Using the data collected to-date, it is anticipated that approximately 80% of this material would be classified as California Hazardous Waste, and 20% of this material would be classified as non-hazardous waste (2,700 tons California Hazardous, 675 tons non-hazardous waste).

Although the lead impacts in the southern portion of the Property have been delineating by borings advanced within the parking area, and north of the parking area, Stantec recommends advancing additional borings between these locations to further characterize the lateral extent of impacts. That additional assessment should be performed at the time of development of the remedial action plan (RAP). These additional efforts would provide additional data to quantify the lead removal volumes more stringently, and provide additional waste profiling data.

Stantec recommends engaging the City of Long Beach Department of Environmental Health to determine if this agency can oversee these efforts. This agency will be able to provide a “No Further Action” (NFA) letter at the conclusion of the remedial efforts. If it is determined that this agency does not have the ability to provide oversight of the soil removals at the Property, another agency will need to be engaged (most likely, DTSC).

The eastern and southern portions of the Property have been used for commercial uses from at least the 1930’s. Although no underground features were identified by the geophysical survey during this assessment, there is potential that undocumented subsurface features may be encountered during redevelopment activities, including in-ground hydraulic lifts, clarifiers, or USTs. Therefore, Stantec recommends a Soil Management Plan (SMP) be developed for the Property. The SMP will provide guidance on agency engagement, and proper management strategies if these structures, or associated contamination, is encountered during redevelopment activities.

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this Phase II Environmental Site Assessment (ESA) report for the property identified as Northwest Block – Atlantic Avenue and South Street, City of Long Beach, County of Los Angeles, California (the "Property", **Figure 1**), on behalf of Brandywine Acquisition Group, LLC (Brandywine) (the "Client"). The assessment activities presented in this report were completed in accordance with Stantec's *Revised Proposal to Perform Phase II Environmental Site Assessment*, dated October 5, 2020. This assessment was performed based on the findings of a Phase I ESA performed for the Property by Stantec in September 2020.

1.1 PROPERTY DESCRIPTION AND OPERATIONS

The Property consists of approximately 3.2 acres of vacant land bounded by 59th Street to the north, Atlantic Avenue to the east, South Street to the south, and Linden Avenue to the west. An asphalt parking lot is located in the southern portion of the Property. The surrounding area consists of residential structures, a library, and various restaurants, retail, and salons. A Property location map is illustrated on **Figure 1**. A Property map illustrating the main features of the Property is provided as **Figure 2**.

According to historical documents, the Property was developed with a service station and battery shop between 1925 and 1950s (5801 and 5803 Atlantic); automotive repair between circa 1933-1968 (509 and 521 South Street); a clothes cleaner/tailor between 1948 and 1953 (5823 Atlantic); and residential and various commercial uses (i.e. churches, office space, retail, and a bank). All structures were demolished in circa 2006 and the Property is currently a vacant lot.

The table below provides addresses associated with the Property, and associated assessor parcel numbers (APNs):

Assessor Parcel Number	Street Address	Size (acre)
7125-033-031	5892 Linden Avenue	0.117
7125-033-032	5886 Linden Avenue	0.11
7125-033-033	5878 Linden Avenue	0.11
7125-033-034	5874 Linden Avenue	0.11
7125-033-035	5866 Linden Avenue	0.11
7125-033-036	5860 Linden Avenue	0.11
7125-033-037	5854/5852 Linden Avenue	0.11
7125-033-038	5850 Linden Avenue	0.11
7125-033-039	5844 Linden Avenue	0.11
7125-033-040	5836 Linden Avenue	0.11
7125-033-041	5826 Linden Avenue	0.11
7125-033-042	5822 Linden Avenue	0.11
7125-033-043	501 East South Street	0.10
7125-033-044	503/505/507/509 East South Street 5801 Atlantic Avenue	0.49
7125-033-045	5893/5895 Atlantic Avenue	0.117
7125-033-046	5887 Atlantic Avenue	0.11
7125-033-047	5873/5879/5881 Atlantic Avenue	0.11
7125-033-048	5869 Atlantic Avenue	0.22
7125-033-049	5869 Atlantic Avenue	0.11
7125-033-050	5847/5849/5855 Atlantic Avenue	0.11
7125-033-051	5843/5845 Atlantic Avenue	0.22
7125-033-052	5835 Atlantic Avenue	0.11
7125-033-053	5827/5829 Atlantic Avenue	0.11
7125-033-054	5821/5823/5825 Atlantic Avenue	0.11
		Total: 3.25

1.2 PROPERTY GEOLOGY AND HYDROGEOLOGY

According to geologic maps of the Property area, near surface lithology consists of recent-age alluvial deposits of silts, clays, and sands. These deposits are undifferentiated from the Pleistocene-age Lakewood Formation of similar composition, which is present to approximately 400 feet below ground surface (bgs) (USGS, 1986).

The Property is located within the southern portion of the Coastal Plain of Los Angeles - Central Subbasin (4-011.04) is bounded on the north by a surface divide called the La Brea high; and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. The southeast boundary between the Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the

Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift (Department of Water Resources [DWR], 2004).

According to the Second Quarter 2020 Groundwater Monitoring Report for the 76 Station 1112 located at 5740 Atlantic Avenue, Long Beach, California which is located adjacent to the southeast, the depth to groundwater was reported between 33 and 41 feet below top of casing and the groundwater flow direction is to the southwest. Based on the information collected to date, groundwater impacts are not suspected.

No groundwater was encountered during assessment activities performed during this investigation.

2.0 BACKGROUND

Stantec performed a Phase I ESA for the Property in September 2020. That assessment identified the following recognized environmental conditions (RECs) in connection with the Property:

Stantec performed a Phase I ESA for the Property in September 2020. That assessment identified the following recognized environmental conditions (RECs) in connection with the Property:

- **Former Auto Service and Gas Station.** Although SCS conducted a previous Phase II ESA in 2005 to evaluate the former auto service and gas station, the provided site map did not indicate the potential location of the UST removed from this property in circa 1955. Additionally, regulatory criteria have become more stringent regarding soil vapor concentrations for residential development since the work was completed by SCS. Stantec recommended conducting a supplemental soil and soil vapor investigation to confirm the previous findings. Additionally, Stantec recommended performing a geophysical survey at this Property address in an attempt to identify the location of the previous underground storage tanks associated with the service station.

- **Capped Pipes.** In December 2004, TEM observed a capped metal pipe at 5843 Atlantic Avenue and several capped metal pipes in the sidewalk south of the 5887 Atlantic Avenue site and could not determine the origin or use of the pipes. The surrounding area historically consisted of gas stations, auto repair, and a laundry operation. Stantec recommended conducting a geophysical survey to determine if the pipes are connected to any underground feature that may be a potential source of impact to the soil.

- **Lead-Impacted Soil.** Based on the lead concentrations detected in the October 2005 Phase II ESA conducted by SCS, lead concentrations in soil exceed residential regulatory criteria. Stantec recommended performing additional soil sampling to determine the vertical and lateral extent of the lead impacts to soil at the Property.

- **Historical Clothes Cleaner/Tailor.** No previous subsurface assessment of the clothes cleaner/tailor historically located at 5823 Atlantic Avenue has been conducted. Stantec recommended collecting soil vapor samples to determine if there is any impact to the subsurface that may be hazardous to human health or the environment.

- **Historical Soil Vapor Data:** Although soil vapor data was collected at the Property address of 5801 Atlantic Avenue by SCS in 2005, the reporting limit of 1 microgram per liter (µg/L) is well above present-day residential screening criteria. Therefore, Stantec recommended performing a soil vapor survey across the Property to evaluate present-day soil vapor conditions.

To investigate these RECs, Stantec recommended performed a Phase II ESA at the Property. The results of that investigation are presented the following sections of this report.

3.0 FIELD INVESTIGATION

Prior to the commencement of fieldwork activities, Stantec made the following preparations:

3.1 PRE-DRILLING ACTIVITIES

- Stantec visited the Property to mark the proposed boring locations. Subsequent to the marking, Stantec notified Underground Service Alert (USA) of Southern California at least 72-hours prior to the commencement of drilling activities; and,
- In accordance with federal Occupational Safety and Health Administration (OSHA) regulations (29 CFR, Section 1910.120), Stantec developed a site-specific Health and Safety Plan (HASP) for the Property. All Stantec personnel and subcontractors associated with the project were required to be familiar with and comply with all provisions of the HASP.

3.2 INVESTIGATION

Stantec provided the services of a field geologist on October 16 and 19, 2020 to supervise and direct the advancement of multiple soil and soil vapor borings at the Property. All work was conducted under the direct oversight of a State of California professional and included the following:

- Perform a subsurface geophysical survey in the southern portion of the Property.
- Advancement of nine (9) soil and soil vapor borings (SB-01 through SB-09).
- Advancement of nine (9) hand auger soil borings (HA-01 through HA-09).

All boring locations advanced during this investigation are depicted on **Figure 3**.

3.2.1 Soil Boring and Sampling Procedures

Prior to mechanical drilling at locations SB-01 through SB-09, a hand auger was used for utility clearance purposes to a depth of five feet bgs within each boring location. Soil samples collected within the upper five feet were collected by discharging the hand auger contents directly into pre-cleaned laboratory-provided eight-ounce glass jars with Teflon®-lined lids.

Once the five-foot depth has been reached, advancement of the borings were attempted using a Geoprobe direct push rig. During advancement, sampling of subsurface soils was performed starting at a depth of approximately five feet bgs. All of the direct push borings were advanced and sampled using a Geoprobe 6620DT rig equipped with 4-foot-long by 1.25-inch inner-diameter sampler with acetate sample liners to the terminal depth of the borehole.

At each sampling interval, the sampler was driven into undisturbed soil using a hydraulic ram on the Geoprobe rig. Upon advancement of the sampler through the desired sampling depth interval, the sample liner was retrieved from the boring. The drilling and sampling sequences was then repeated at 5 feet intervals for the entire depth of the boring.

The soils from each of the direct push borings were visually examined by Stantec field personnel who classified the soils in accordance with the Unified Soil Classification System (USCS). A photo-ionization detector (PID) was used to monitor/field screen the soils collected. Field screening for VOCs was achieved by removing the soil from the uppermost sample sleeve and placing it in a zip-lock type baggie. A PID probe was inserted into the baggie to monitor the headspace for VOC vapors.

Following classification and VOC vapor evaluation, the soil samples were carefully packaged for chemical analysis by sealing the ends of the acetate liner with Teflon ® sheeting, covering with plastic end caps, and sealing with non-VOC containing tape. All sample containers were labeled with the appropriate identification information (boring number, sample depth, sample collection date, and sample collection time). The samples were logged on a chain-of-custody form and delivered to a state certified laboratory for analysis. Laboratory analysis is discussed in Section 4.0.

3.2.2 Soil Vapor Probe Installation

At the completion of drilling to target depth, soil borings SB-01 through SB-09 were converted to multi-depth soil vapor monitoring points at the five- and fifteen-foot depth intervals. Subsurface soil vapor probe installation was performed in accordance with the July 2015 DTSC “Advisory - Active Soil Gas Investigations” (DTSC Advisory).

Each sample probe was constructed with a 1-inch-long Airstone sampling screen set at the prescribed sampling intervals. Each of the sampling screens was constructed with a permeable Airstone vapor tip connected to ¼-inch outer diameter Nylaflow tubing that was lowered to the bottom of the borehole and backfilled with filter sand, until approximately 12-inches of filter pack was placed. A transition seal consisting of approximately 12-inches of dry bentonite was then placed above the filter pack, followed by an annular seal consisting of hydrated bentonite until the next sampling interval was reached. The sequence was then repeated to install the second monitoring point, and/ or completely backfill the borehole. At the surface, the exposed nylon tubing was capped with tight fitting plastic endcaps and labeled to indicate sampling depth, and covered with plastic sheeting to protect against rainfall events. After placement of the soil vapor sample probes on October 16, 2020, subsurface conditions were allowed to equilibrate a minimum of 48-hours prior to leak testing and sample collection on October 19, 2020.

3.2.3 Soil Vapor Sampling

Soil vapor samples were collected on October 19, 2020 in accordance with the methods and procedures outlined by the DTSC Advisory, a minimum of 48-hours after installation in order to allow for equilibration.

Prior to sampling, a shut-in test was conducted on the sampling train to ensure all connections and fittings were airtight. The shut-in test was performed on the sampling train by applying a vacuum of 100 inches of water to the sampling train and monitoring magnehelic gauges for a pressure drop for one minute. If loss of vacuum was observed, the fittings were adjusted as needed until no vacuum loss was observed during subsequent shut-in tests.

After the sampling equipment passed the shut-in test, the probes were purged using an air pump outfitted with a low-flow module to remove internal air from the sample train (calculated from the internal volume of the tubing and probe tip); the void space of the sand pack around the probe tip; and the void space of the dry bentonite (in the annular space). Three internal volumes were purged from each sampling location at a rate less than 200 milliliters per minute (ml/min).

Immediately following purging the internal volumes, the soil vapor samples were collected by Stantec staff into laboratory-provided pre-cleaned Summa® canisters using a flow controller set to 200 ml/min. A tracer compound of isopropyl alcohol (IPA) was placed above the surface seal and along the sampling train to evaluate the integrity of the seal. No tracer compounds were detected in the soil vapor samples collected during this investigation. One soil vapor sample was collected from each soil vapor probe. Soil vapor sample analysis is discussed in Section 4.0.

3.2.4 Field Equipment Cleaning Procedures

To maintain quality control during drilling operations, all drill rods and reusable soil sampling equipment was decontaminated using a triple bucket rinse. Prior to drilling at a given location or sampling interval, all equipment coming in direct contact with soil samples was scrubbed with an Alconox scrub solution followed by a clean tap water rinse and then a final distilled water rinse. The disposable acetate soil sample liners were used for one sampling interval and then discarded.

4.0 LABORATORY TESTING PROGRAM

Soil samples collected during this investigation were delivered under chain of custody to Positive Lab Services (PLS), located in Los Angeles, California. Select soil samples were submitted for analyses of total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and California Code of Regulations Title 22 metals by United States Environmental Protection Agency (USEPA) test methods 8015, 8260, and 6010/7471A, respectively.

Soil vapor samples collected during this investigation were delivered under chain of custody to Jones Environmental Laboratories (JEL), located in Santa Fe Springs, California. All soil vapor samples were submitted for analysis of VOCs by USEPA test method 8260. PLS and JEL are certified to perform hazardous waste testing by the California State Water Resources Control Board Environmental Laboratory Accreditation Program (ELAP).

5.0 INVESTIGATION RESULTS

5.1 FIELD OBSERVATIONS

On October 16, 2020, Stantec personnel oversaw the advancement of eighteen (18) soil and soil vapor borings at the Property. Soil borings HA-01 through HA-04, and soil vapor borings SB-01 through SB-04 were advanced in the northern portion of the Property. The remainder of the boreholes were advanced in the southern portion of the Property to investigate the lateral and vertical limits of the previously-identified elevated lead concentrations, and potential impacts from the historical auto repair facility, gas station, former UST, and laundromat facilities. Borings HA-06, HA-08, and HA-09 were advanced in the vicinity of SCS borings B2, B4, and B6, respectively. The table below is provided to summarize soil boring placement and features assessed during this investigation. All soil borings are depicted on **Figure 3**.

Feature Assessed	Boring ID	Terminal Depth (feet bgs)	Soil Sampling Depth	Soil Vapor Probe Depth (feet bgs)
Former UST Location	SB-07	15.5	1, 3, 5, 10, 15	5, 15
	SB-08	15.5	1, 3, 5, 10, 15	5, 15
Former Auto Service	SB-05	15.5	1, 3, 5, 10, 15	5, 15
	SB-06	15.5	1, 3, 5, 10, 15	5, 15
	SB-09	15.5	1, 3, 5, 10, 15	5, 15
Elevated Lead Impacts	HA-05	5	1, 3, 5	--
	HA-06	5	1, 3, 5	--
	HA-07	5	1, 3, 5	--
	HA-08	5	1, 3, 5	--
	HA-09	5	1, 3, 5	--
Site-Wide Lead Assessment	HA-01	5	1, 3, 5	--
	HA-02	5	1, 3, 5	--
	HA-03	5	1, 3, 5	--
	HA-04	5	1, 3, 5	--
Site-Wide Soil Vapor and Lead Assessment	SB-01	15.5	1, 3, 5	5, 15
	SB-02	15.5	1, 3, 5	5, 15
	SB-03	15.5	1, 3, 5	5, 15
	SB-04	15.5	1, 3, 5	5, 10

Soils encountered during this assessment consisted largely of silty sand from surface to the maximum explored depth of 15.5 feet bgs. Generally, the northern, unpaved portion of the Property is overlain with approximately one- to four-inches of wood chips and gravel. Minor amounts of gravel were encountered sporadically in this area up to two-feet bgs. Large cobbles were encountered in multiple borings within the paved area in the southern portion of the Property. Refusal was encountered at boring location HA-

09 at approximately 1.5 feet bgs due to large cobbles and concrete debris, indicative of fill materials; consequently, no soil samples were retrieved from this location. All PID readings measured 0.0 parts per million by volume (ppmV).

A geophysical survey was performed by Pacific Coast Locators in the southern portion of the Property to identify subsurface utilities and investigate the presence of the former on-site USTs up to a depth of approximately 10 feet bgs. The survey included the use of various geophysical techniques, including ground penetrating radar (GPR), electro-magnetic (EM), and magnetic (mag). An approximate 10-foot by 10-foot area of disturbed soil was identified in the eastern portion of the paved parking area in the southern portion of the Property.

Although the former UST is plotted in the extreme southeastern corner of the Property by a fire insurance map dated 1950, this disturbed area was interpreted as a suspect cavity. Therefore, soil boring SB-07 was advanced within this disturbed soil area, and SB-08 was advanced within the mapped area of the former UST.

Geophysical locating services were performed in the northern, unpaved portion of the Property only in connection with clearing of the boreholes advanced during this investigation. Due to the northern portion of the Property utilized for residence (western portion) and retail (eastern portion), and no environmental database or agency documents indicate the presence of underground structures in this area, the UST survey was confined to the southern portion of the Property where automotive repair, a gasoline service station, and clothing launderer formerly operated. The geophysical report is attached as **Appendix A**.

5.2 ANALYTICAL RESULTS

Laboratory analytical test results from this assessment are attached as **Appendix B**. The laboratory test results from this investigation are discussed below and were compared to the more conservative value between the DTSC Human and Ecologic Risk Office (HERO), Note 3 screening levels for residential and commercial land use (DTSC, 2020),and the USEPA Regional Screening Levels (RSLs) for residential sites (USEPA, 2020). All soil concentrations are reported and discussed in units of milligrams per kilogram (mg/kg), and are summarized in **Table 1**. All soil vapor concentrations are reported and discussed in units of micrograms per cubic meter (µg/m^3), and summarized in **Table 2**.

5.2.1 Soil Results

Elevated lead concentrations exceeding the residential screening level of 80 mg/kg were detected in several shallow one-foot soil samples collected in the southern portion of the Property, up to a maximum concentration of 1210 mg/kg at soil boring HA-05. No lead was detected above the residential screening level of 80/mg/kg in any of the three-foot soil samples analyzed during this investigation. The lead detections appear to be confined to the upper two feet of soil beneath the asphalt-paved parking area in the southern portion of the Property. The elevated lead detections are generally concurrent with the lead results from the SCS investigation performed in 2006. Lead concentrations were not detected in soil samples collected in the northern portion of the Property beyond the asphalt-paved parking area.

Soluble threshold limit concentration (STLC) analyses for lead was performed on samples HA-06-1, HA-07-1, and SB-06-1. STLC for lead was detected above 5.0 milligram per liter (mg/L) in these samples, which exceeds the CCR Title 22 hazardous waste limit. Toxicity characteristic leading procedure (TCLP) analyses for lead was performed on sample HA-05-1 to determine if these materials would be classified as Resource Conservation and Recovery Act (RCRA) waste. TCLP for lead was detected at 1.42 mg/L in sample HA-05-1, which does not exceed the RCRA waste limit of 5.0 mg/L.

No TPH or VOCs were detected above laboratory reporting limits in the soil samples collected from the suspected UST cavity at boring location SB-07 (*i.e.* results were “non-detect”).

5.2.2 Soil Vapor Results

Various VOCs were detected in soil vapor throughout the Property. Specifically, benzene, chloroform, naphthalene, and tetrachloroethylene (PCE) were detected at concentrations above their respective soil vapor screening levels using an attenuation factor of 0.03. However, none of the chemicals detected in soil vapor exceeded residential risk levels using an attenuation factor of 0.001, currently used by DTSC for assessing risk. Therefore, Stantec concludes that using the current risk-based screening level calculated by using the 0.001 attenuation factor, no soil vapor levels were detected above the residential risk levels.

6.0 CONCLUSIONS AND RECOMMENDATIONS

A geophysical survey was performed in the southern portion of the Property to identify subsurface utilities and investigate the presence of the former on-site USTs. An approximate 10-foot by 10-foot area of disturbed soil was identified in the eastern portion of the paved parking area in the southern portion of the Property. Although the former UST is plotted in the extreme southeastern corner of the Property by a fire insurance map dated 1950, this disturbed area was interpreted as a suspect cavity. Therefore, soil boring SB-07 was advanced within this disturbed soil area, and SB-08 was advanced within the mapped area of the former UST. Soil samples collected within the suspected former UST cavity indicated no impacts of TPH or VOCs to soil. Therefore, Stantec recommends no further investigations regarding the former USTs at the Property.

Various VOCs were detected in soil vapor throughout the Property. Specifically, benzene, chloroform, naphthalene, and tetrachloroethylene (PCE) were detected at concentrations above their respective soil vapor screening levels using an attenuation factor of 0.03. However, none of the chemicals detected in soil vapor exceeded residential risk levels using an attenuation factor of 0.001, currently used by DTSC for assessing risk. Therefore, Stantec concludes that using the current risk-based screening level calculated by using the 0.001 attenuation factor, no soil vapor levels were detected above the residential risk levels. Therefore, Stantec is not recommending further investigations regarding soil vapor conditions at the Property.

Elevated lead concentrations exceeding residential use screening levels of 80 mg/kg have been identified in shallow soils beneath the asphalt-paved parking area in the southern portion of the Property. No samples collected at the three-foot depth interval in this area reported elevated lead concentrations above the 80 mg/kg concentration, indicating that the lead impacts are within the upper 1’ to 2’ of soil. The highest lead detection was in the one-foot soil sample collected from HA-05 at 1210 mg/kg, exceeding the California Hazardous Waste classification for total lead of 1000 mg/kg. Lead solubility analyses indicates that a large portion of the lead impacted soil classify as California Hazardous waste (Non-RCRA). These California hazardous waste areas include, at a minimum, the materials in the vicinity of borings HA-05, HA-06, HA-08, and SB-06. No lead concentrations exceeding residential screening levels have been identified in the northern, unpaved portion of the Property.

The southern portion of the Property has historically been used for various purposes, including automotive repair, service stations, and a laundromat. These structures have been removed, and no buildings currently occupy this area. Some debris was noted in the shallow soils within the southern portion of the Property, including cobbles, and asphalt, brick, and glass fragments. Due to the lead impacts coinciding with the observed debris in shallow soils, it is suspected that undocumented fill material may be present in this area and could be the source of the lead impacts found in this portion of the Property.

With the data collected to date, it appears that the lead impacted soil is present in an area of approximately 22,000 square feet to a depth of approximately two feet. Based on this measurement it is estimated that approximately 1,600 yards (or 2,400 tons using 1.5 tons per cubic yard) of California non-hazardous and California Hazardous Waste is present on the Property. Given the lead impacts are suspected to be sourced from undocumented fill placed at the Property, lead concentrations within this material are inherently heterogenous. Therefore, as a conservative estimate of the total volume, it should be anticipated to remove the entirety of the asphalt-paved parking area to a depth of two feet. This would result in approximately 2,250 yards (or 3,375 tons). Using the data collected to-date, it is anticipated that approximately 80% of this material would be classified as California Hazardous Waste, and 20% of this material would be classified as non-hazardous waste (2,700 tons California Hazardous, 675 tons non-hazardous waste).

Although the lead impacts in the southern portion of the Property have been delineating by borings advanced within the parking area, and north of the parking area, Stantec recommends advancing additional borings between these locations to further characterize the lateral extent of impacts. That additional assessment should be performed at the time of development of the remedial action plan (RAP). These additional efforts would provide additional data to quantify the lead removal volumes more stringently, and provide additional waste profiling data.

Stantec recommends engaging the City of Long Beach Department of Environmental Health to determine if this agency can oversee these efforts. This agency will be able to provide a “No Further Action” (NFA) letter at the conclusion of the remedial efforts. If it is determined that this agency does not have the ability to provide oversight of the soil removals at the Property, another agency will need to be engaged (most likely, DTSC).

The eastern and southern portions of the Property have been used for commercial uses from at least the 1930’s. Although no underground features were identified by the geophysical survey during this assessment, there is potential that undocumented subsurface features may be encountered during redevelopment activities, including in-ground hydraulic lifts, clarifiers, or USTs. Therefore, Stantec recommends a Soil Management Plan (SMP) be developed for the Property. The SMP will provide guidance on agency engagement, and proper management strategies if these structures, or associated contamination, is encountered during redevelopment activities.

7.0 LIMITATIONS

The conclusions presented in this report are professional opinions based on data described in this report. The opinions of this report have been arrived at in accordance with currently accepted hydrogeologic and engineering standards and practices applicable to this location and are subject to the following inherent limitations. Stantec makes no other warranty, either expressed or implied, concerning the conclusions and professional advice that is contained within the body of this report.

Inherent in most projects performed in a heterogeneous subsurface environment, continuing excavation and assessments may reveal findings that are different than those presented herein. This facet of the environmental profession should be considered when formulating professional opinions on the limited data collected on these projects.

This report has been issued with the clear understanding that it is the responsibility of the owner, or their representative, to make appropriate notifications to regulatory agencies. It is specifically not the responsibility of Stantec to conduct appropriate notifications as specified by current County and State regulations.

The information presented in this report is valid as of the date our exploration was performed. Site conditions may degrade with time; consequently, the findings presented herein are subject to change.

TABLES

Table 1
Summary of Soil Analytical Results
Northwest Corner Atlantic Avenue and East South Street
Long Beach, California

Stantec Project Number: 185804904

Sample ID (1)	Sampling Date	Sampling Depth (ft)	8015B			8260B	6010B		
			GRO	DRO	ORO	VOCs	Total Lead	STLC Lead (mg/L)	TCLP Lead (mg/L)
Residential Screening Level (2)			100	260	1600	Varies	80	--	--
California Hazardous Waste Criteria			NE	NE	NE	NE	1000	5.0	NE
RCRA Hazardous Waste Criteria			NE	NE	NE	NE	NE	NE	5.0
Samples									
HA-01-1	10/19/2020	1.0	--	--	--	--	**7.45**	--	--
HA-02-1	10/19/2020	1.0	--	--	--	--	**15.5**	--	--
HA-03-1	10/19/2020	1.0	--	--	--	--	**16.3**	--	--
HA-04-1	10/19/2020	1.0	--	--	--	--	**22.4**	--	--
HA-05-1	10/19/2020	1.0	--	--	--	--	**1210**	--	**1.42**
HA-05-3	10/19/2020	3.0	--	--	--	--	**6.83**	--	--
HA-05-5	10/19/2020	5.0	--	--	--	--	**6.14**	--	--
HA-06-1	10/19/2020	1.0	--	--	--	--	**328**	**31.7**	--
HA-06-3	10/19/2020	3.0	--	--	--	--	**5.89**	--	--
HA-07-1	10/19/2020	1.0	--	--	--	--	**30.5**	--	--
HA-07-3	10/19/2020	3.0	--	--	--	--	**43.1**	--	--
HA-08-1	10/19/2020	1.0	--	--	--	--	**196**	**16.3**	--
HA-08-3	10/19/2020	3.0	--	--	--	--	**7.17**	--	--
HA-09-1	10/19/2020	1.0	--	--	--	--	**42.3**	--	--
SB-01-1	10/19/2020	1.0	--	--	--	--	**9.69**	--	--
SB-02-1	10/19/2020	1.0	--	--	--	--	**6.58**	--	--
SB-03-1	10/19/2020	1.0	--	--	--	--	**23.6**	--	--
SB-04-1	10/19/2020	1.0	--	--	--	--	**15**	--	--
SB-05-1	10/19/2020	1.0	--	--	--	--	**5.37**	--	--
SB-05-3	10/19/2020	3.0	--	--	--	--	**6.95**	--	--
SB-06-1	10/19/2020	1.0	--	--	--	--	**146**	**8.42**	--
SB-06-3	10/19/2020	3.0	--	--	--	--	**33.7**	--	--
SB-07-1	10/19/2020	1.0	--	--	--	--	**5.13**	--	--
SB-07-3	10/19/2020	3.0	--	--	--	--	**6.56**	--	--
SB-07-10	10/19/2020	10.0	<0.5	**2.9**	<100	<varies	--	--	--
SB-07-15	10/19/2020	15.0	<0.5	<2.5	<100	<varies	--	--	--
SB-08-1	10/19/2020	1.0	--	--	--	--	**11.1**	--	--
SB-08-3	10/19/2020	3.0	--	--	--	--	**36.1**	--	--
SB-09-1	10/19/2020	1.0	--	--	--	--	**115**	--	--
SB-09-3	10/19/2020	3.0	--	--	--	--	**74**	--	--

NOTES:

All concentrations reported in milligrams per kilogram (mg/kg)

(1) Refer to Figure 3 for sampling locations

(2) Residential screening level is more conservative value between the DTSC Note 3 and USEPA RSL

(3) Background concentrations sourced from Kerney et al., University of California, March 1996

< - Indicates the concentration was not detected above the laboratory method reporting limit.

-- indicates the sample was not analyzed

BOLD - Indicates the concentration is above the laboratory reporting level

ABBREVIATIONS:

DTSC HERO Note 3 - Department of Toxic Substance Control Human Ecological Risk Office Note 3 Screening Levels (June 2020)

DRO - Diesel Range Organics

GRO - Gasoline Range Organics

ORO - Oil Range Organics

USEPA RSLs - United States Environmental Protection Agency Regional Screening Levels for Residential Soils (May 2020)

STLC - Soluble Threshold Limit Concentration

TCLP - Toxicity Characteristic Leaching Procedure

🟨 Concentration exceeds Residential Screening Levels

🟧 Concentrations exceeds hazardous waste criteria

Table 2
Summary of Soil Vapor Analytical Results
Northwest Corner Atlantic Avenue and East South Street
Long Beach, California

Stantec Project Number: 185804904

Sample ID	Sample Depth [(1)]	Sample Date	Acetone	2-Butanone (MEK)	Benzene	Chloroform	Dichlorofluoromethane (Freon 12)	4-Methyl-2-pentanone (MIBK)	Naphthalene	PCE	TCE	Toluene	Trichlorofluoromethane (Freon 11)	1,2,4-TMB	m,p-Xylene	o-Xylene	Other VOCs
Residential Screening Level (0.03 AF) [(2)]			***1,066,667***	***173,333***	***3.23***	***4.0***	***NE***	***14,000***	***2.77***	***15.3***	***16.0***	***10,333***	***43,333***	***2,100***	***3,333***	***3,333***	***Varies***
Residential Risk Level (0.001 AF) [(2)]			***32,000,000***	***5,200,000***	***97***	***120***	***NE***	***420,000***	***83***	***460***	***480***	***310,000***	***1,300,000***	***63,000***	***100,000***	***100,000***	***Varies***
SB-01-05	5	10/19/2020	<3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<varies
SB-01-15	15	10/19/2020	**14.3**	**3.1**	<1.0	<1.0	**2.3**	<1.0	<1.0	**7.0**	<1.0	**3.3**	<1.0	<1.0	<1.0	<1.0	**Carbon Disulfide: 3.0** **Cyclohexane: 1.5** **Methylene Chloride: 1.0**
SB-02-05	5	10/19/2020	**11.7**	**3.0**	<1.0	<1.0	**2.6**	<1.0	<1.0	**2.4**	<1.0	**3.4**	**1.1**	<1.0	<1.0	<1.0	<varies
SB-02-15	15	10/19/2020	**11.8**	**3.3**	<1.0	<1.0	**2.3**	<1.0	<1.0	**5.6**	<1.0	**3.3**	<1.0	**1.5**	<1.0	<1.0	**Carbon Disulfide: 1.4**
SB-03-05	5	10/19/2020	**17.6**	**9.0**	**11**	<1.0	**2.1**	<1.0	**6.0**	**3.6**	<1.0	**5.7**	**10**	**15.5**	**14.1**	**2.0**	**4-Ethyltoluene: 7.5** **Carbon Disulfide: 4.8** **Cyclohexane: 3.6** **Ethylbenzene: 3.9** **Isopropylbenzene: 1.6** **MBK: 5.4** **MIBK: 3.2** **n-Propylbenzene: 5.2** **sec-Butylbenzene: 1.9** **1,3,5-TMB: 3.1**
SB-03-15	15	10/19/2020	**26.9**	**6.7**	<1.0	<1.0	**2.6**	<1.0	<1.0	**3.4**	<1.0	**5.3**	**9.5**	**1.3**	<1.0	<1.0	**Carbon Disulfide: 6.6** **Propylene: 3.0**
SB-04-05	5	10/19/2020	**8.1**	**4.0**	<1.0	**13.9**	**2.2**	<1.0	<1.0	<1	<1.0	**3.8**	<1.0	<1.0	<1.0	<1.0	<varies
SB-04-15	15	10/19/2020	**10**	**3.5**	<1.0	<1.0	**2.5**	<1.0	<1.0	**3.7**	<1.0	**3.5**	**1.1**	<1.0	<1.0	<1.0	**Carbon Disulfide: 3.5** **Methylene Chloride: 1.2**
SB-05-05	5	10/19/2020	**17.0**	**6.3**	<1.0	<1.0	**2.6**	<1.0	<1.0	**90.5**	<1.0	**3.3**	**1.1**	<1.0	<1.0	<1.0	**Isopropanol: 5.4** **Methylene Chloride: 1.2**
SB-05-15	15	10/19/2020	**12.3**	**5.5**	**1.0**	**30.6**	**2.6**	<1.0	<1.0	**64.9**	<1.0	**11.8**	**1.1**	**1.4**	**2.0**	<1.0	**Carbon Disulfide: 4.7**
SB-06-05	5	10/19/2020	**45.3**	**11.5**	<1.0	<1.0	**2.3**	**2.3**	<1.0	**26.1**	<1.0	**2.9**	**1.0**	**2.6**	<1.0	<1.0	**Isopropanol: 11.3** **MBK: 2.8** **Methylene Chloride: 1.4** **MIBK: 2.3** **Propylene: 1.0**
SB-06-15	15	10/19/2020	**12.4**	**8.7**	<1.0	<1.0	**2.2**	**1.0**	<1.0	**20.8**	<1.0	**4.0**	**1.0**	**1.0**	<1.0	<1.0	**Isopropanol: 7.3** **4-Isopropyl toluene: 1.7** **MIBK: 1.0**
SB-07-05	5	10/19/2020	**13.3**	**7.0**	<1.0	<1.0	**2.0**	<1.0	<1.0	**2.4**	<1.0	**3.2**	**1.0**	**1.0**	<1.0	<1.0	**4-Isopropyl toluene: 1.6** **MBK: 1.0**
SB-07-15	15	10/19/2020	**17.2**	**7.7**	<1.0	<1.0	**2.2**	<1.0	<1.0	**3.3**	<1.0	**5.2**	<1.0	<1.0	**1.0**	<1.0	**Carbon Disulfide: 1.4** **4-Isopropyl toluene: 1.4** **MBK: 1.6**

Table 2
Summary of Soil Vapor Analytical Results
Northwest Corner Atlantic Avenue and East South Street
Long Beach, California
Stantec Project Number: 185804904

Sample ID	Sample Depth (1)	Sample Date	Acetone	2-Butanone (MEK)	Benzene	Chloroform	Dichlorofluoromethane (Freon 12)	4-Methyl-2-pentanone (MIBK)	Naphthalene	PCE	TCE	Toluene	Trichlorofluoromethane (Freon 11)	1,2,4-TMB	m,p-Xylene	o-Xylene	Other VOCs
Residential Screening Level (0.03 AF) (2)			***1,066,667***	***173,333***	***3.23***	***4.0***	***NE***	***14,000***	***2.77***	***15.3***	***16.0***	***10,333***	***43,333***	***2,100***	***3,333***	***3,333***	***Varies***
Residential Risk Level (0.001 AF) (2)			***32,000,000***	***5,200,000***	***97***	***120***	***NE***	***420,000***	***83***	***460***	***480***	***310,000***	***1,300,000***	***63,000***	***100,000***	***100,000***	***Varies***
SB-08-05	5	10/19/2020	**12.5**	**6.1**	<1.0	**1.2**	**2.3**	<1.0	<1.0	**3.4**	<1.0	**2.8**	<1.0	<1.0	<1.0	<1.0	**Carbon Disulfide: 1.2**
SB-08-15	15	10/19/2020	**16.5**	**7.6**	<1.0	<1.0	**2.5**	<1.0	<1.0	**7.0**	<1.0	**3.6**	<1.0	<1.0	<1.0	<1.0	**Carbon Disulfide: 2.1** **Cyclohexane: 1.0** **Ethyl Acetate: 1.9** **MBK: 1.9**
SB-09-05	5	10/19/2020	**12.3**	**6.4**	<1.0	<1.0	**2.3**	<1.0	<1.0	**14.1**	<1.0	**3.0**	**1.1**	<1.0	<1.0	<1.0	<varies
SB-09-15	15	10/19/2020	**23.2**	**10.0**	<1.0	<1.0	**2.3**	**2.7**	**2.5**	**20.0**	<1.0	**8.3**	<1.0	**2.3**	**99.6**	**33.1**	**Carbon Disulfide: 9.5** **4-Isopropyl toluene: 3.8** **Ethylbenzene: 18.7** **MBK: 2.6** **MIBK: 2.7**

Notes:

All concentrations reported in microgram per cubic meter (μg/m^3)

(1) - Reported as feet below original grade.

(2) - More conservative screening level between USEPA Region 9 RSL (May, 2020) and DTSC HERO Note 3 (April, 2019)

"<" - Results reported below Laboratory Reporting Limit.

AF - Attenuation Factor

CA EPA - California Environmental Protection Agency

DTSC - Department of Toxic Substance Control

EPA - United States Environmental Protection Agency

HERO - Human and Ecological Risk Office

"J" - Analyte detected above method detection limit, but below laboratory reporting limit

BOLD - Analyte detected above laboratory report lining limit

Abbreviations:

NA - Not Analyzed

NE - Not Established

PCE - Tetrachloroethene

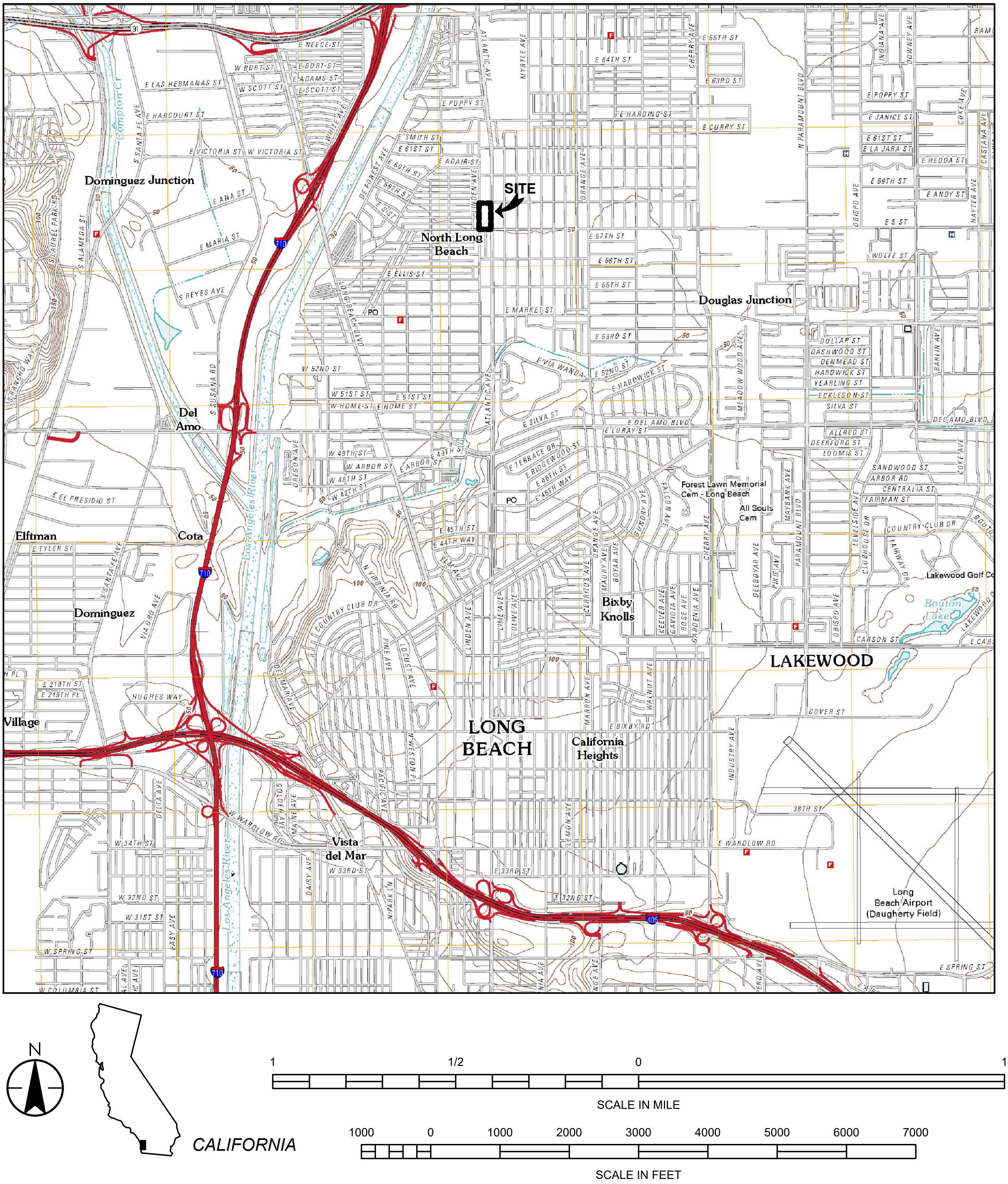
1,2,4-TMB - 1,2,4-Trimethylbenzene

1,3,5-TMB - 1,3,5-Trimethylbenzene

VOCs - Volatile Organic Compounds

▨ Indicates value above the residential screening level (0.03 AF)

FIGURES



REFERENCE: USGS 7.5 X 15 MINUTE QUADRANGLE; LONG BEACH, CALIFORNIA, 2016.

Stantec

735 EAST CARNEGIE DRIVE, SUITE 280
SAN BERNARDINO, CALIFORNIA
PH (909) 335-6116 FAX (909) 335-6120

FOR:

BRANDYWINE HOMES
NORTHWEST CORNER OF
ATLANTIC AVE AND EAST SOUTH ST
LONG BEACH, CALIFORNIA

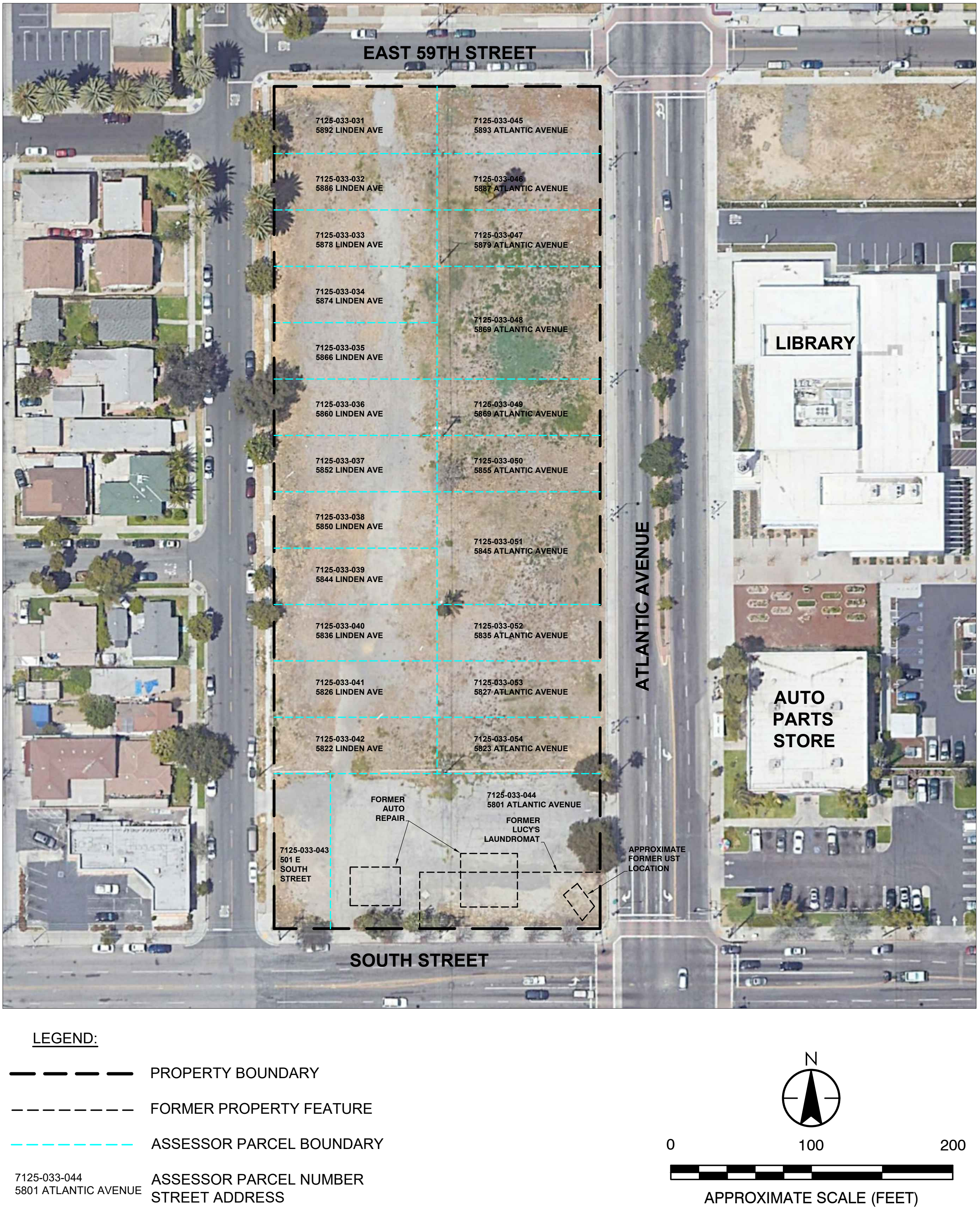
SITE LOCATION MAP

FIGURE:

1

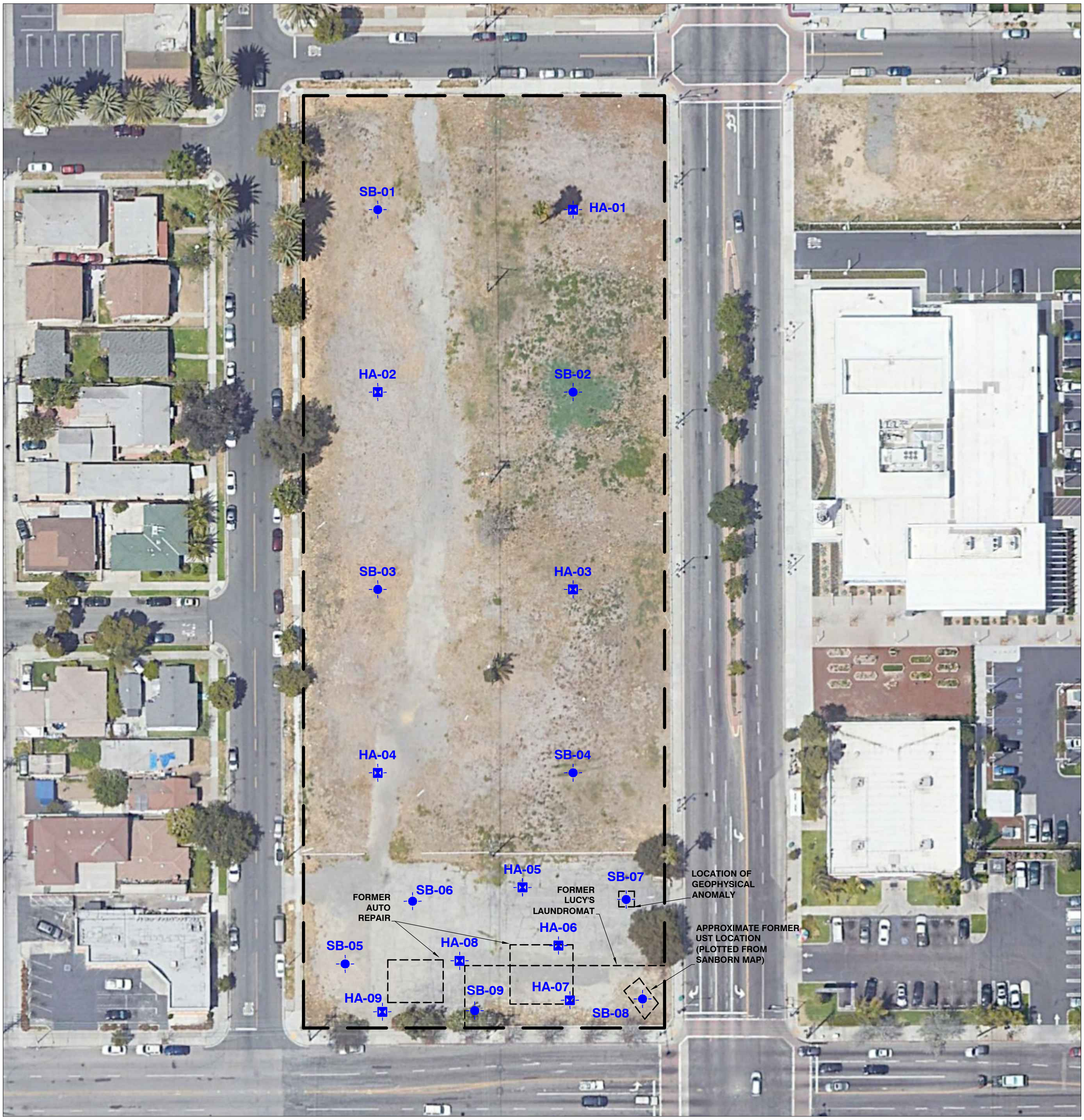
JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185804904	JS	AJ	KE	09/21/2020

FILEPATH:V:\1858\active\185804904\05_report_deliv\drawings_design\cad_fig\brandywine_long_beach_figures.dwg modified by jsargent on Sep 21, 2020 at 16:02



735 EAST CARNEGIE DRIVE, SUITE 280 SAN BERNARDINO, CALIFORNIA PH (909) 335-6116 FAX (909) 335-6120	FOR: BRANDYWINE HOMES NORTHWEST CORNER OF ATLANTIC AVE AND EAST SOUTH ST LONG BEACH, CALIFORNIA		**PROPERTY MAP**	FIGURE: 2
	JOB NUMBER: 185804905	DRAWN BY: JS	CHECKED BY: AJ	APPROVED BY: KE	DATE: 09/21/2020

FILEPATH:V:\1858\active\185804904\05_report_deliv\drawings_design\cad_fig\brandywine_long_beach_figures.dwg modified by jsargent on Sep 21, 2020 at 16:02



LEGEND:

▬ ▬ ▬ ▬	PROPERTY BOUNDARY
— — — — — — — —	FORMER PROPERTY FEATURE
HA-09 ⊠	HAND AUGER BORING LOCATION
SB-09 ●	SOIL/SOIL VAPOR BRING LOCATION

N

0 100 200

APPROXIMATE SCALE (FEET)

Stantec

735 EAST CARNEGIE DRIVE, SUITE 280
SAN BERNARDINO, CALIFORNIA
PH (909) 335-6116 FAX (909) 335-6120

FOR:

BRANDYWINE HOMES
NORTHWEST CORNER OF
ATLANTIC AVE AND EAST SOUTH ST
LONG BEACH, CALIFORNIA

SOIL BORING MAP

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185804905	JS	AJ	KE	10/21/2020

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APPENDIX A

Pacific Coast Locators

Subsurface Investigation Report

Subsurface Investigation Report

Project:

Brandywine Homes Project
Atlantic Ave. & E. South St.
Long Beach, CA

Prepared For:

Joshua Sargent
Stantec Consulting Services, Inc.

Prepared By:

Pacific Coast Locators, Inc.
EM & GPR Technicians
2606 Foothill Blvd., Ste. G La Crescenta, CA 91214
Ph: 818-249-7700   Fax: 818-249-7701

INTRODUCTION

Pacific Coast Locators, Inc. performed a Subsurface Investigation on Friday, October 16th, 2020 to clear and mark-out all accessible underground utilities for 9 proposed boring locations on-site. Our technician also performed a sweep & scan to look for any potential Underground Storage Tank(s), associated features and/or evidence of excavation.

METHODOLOGY AND EQUIPMENT

The GSSI UtilityScan SIR 3000 Ground Penetrating Radar unit with 400MHz antenna sends a dielectric signal into the earth, which registers with the density of the soil that it is penetrating. Any other material of varied density will either speed up the signal creating an inverted hyperbola or slow it down leaving a hyperbola trail. This is similar to a rock in a creek. The water bends around the rock leaving a tail wake. The GPR signal is not bending, however; it is sending back a continuous signal of the curvature of the anomaly or buried feature it encounters. GPR findings are not always accurate due to certain site conditions such as soil lithology, moisture and soil make-up. These can limit the depth to which the GPR antenna can penetrate to locate buried features.

The RD8100 Electro-Magnetic Transmitter & Receiver has Inductive & Conductive capability to locate buried conductive underground utilities, such as copper, steel and galvanized metal water pipes, electrical lines, power lines, tele-communication lines, metal and steel gas lines, and metal and steel pipelines. The RD8100 features include multiple active frequencies to delineate actively the depth and location of the target utility or pipe. The RD8100 receiver has a peak and null gain feature that pinpoints the target utility or pipe in congested areas. The audible signal to noise feature makes it easy for the locating technician to determine accurately the location of a directly connected utility or pipe by sound.

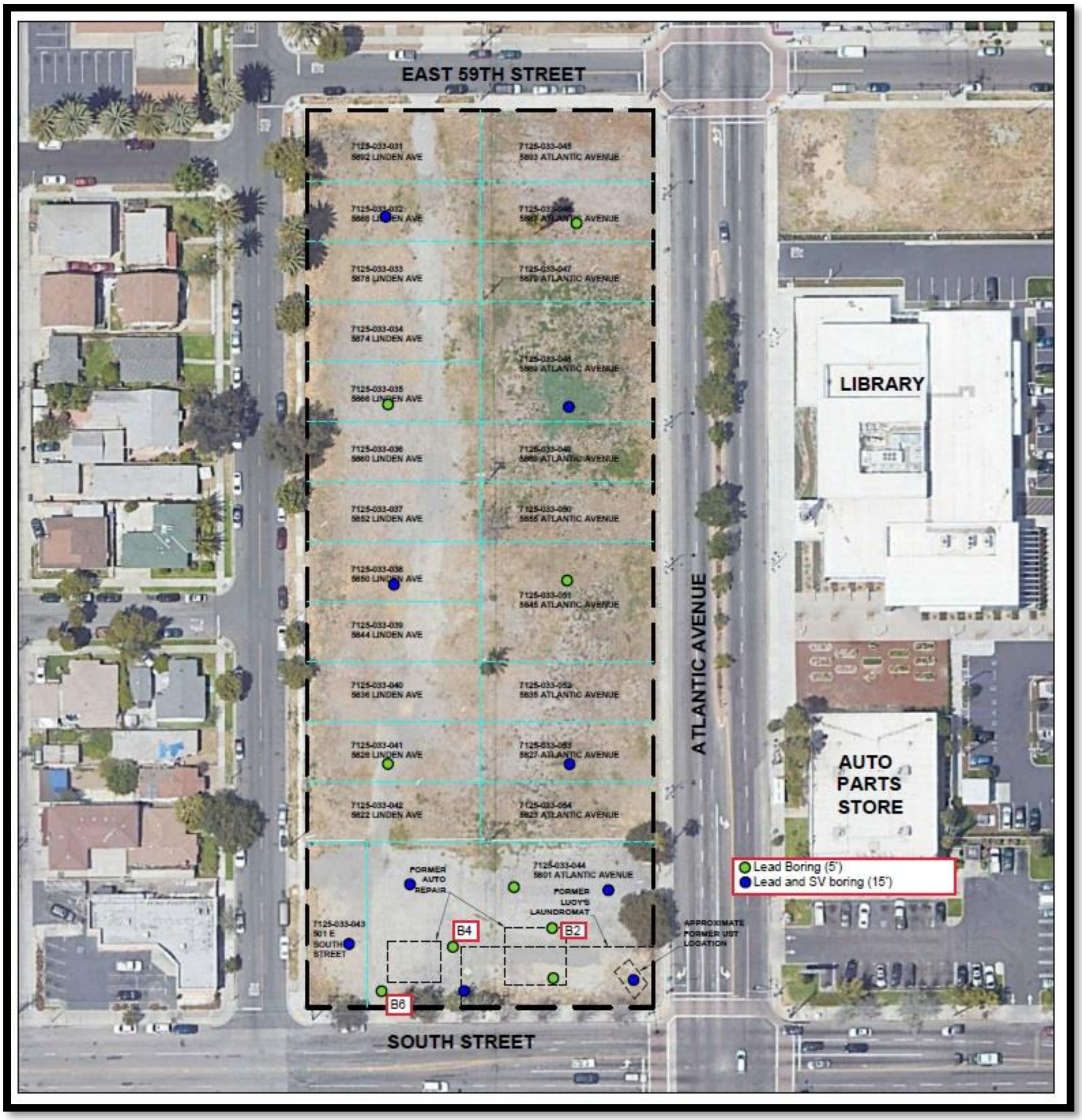
According to Radio Detection, the specifications of the RD8100 include
Sensitivity: 6E-15 Tesla 5µA at 1 meter (33kHz)
Dynamic range: 140dB rms/√Hz
Selectivity: 120dB/Hz
Depth measurement precision: ± 3%
Locate accuracy: ± 5% of depth

The Jameson Duct Hunter 300 Traceable Rodder uses the RD8100 transmitter to energize the rod which is pushed into underground pipe to emit signal that is picked up by the RD8100 receiver above ground. This allows an entire buried utility pipe to be traced and marked continuously from above ground by one man without digging. The rod's ferrule attaches to a 512 Mhz sonde, roller guide, or pulling eye. 5/16" diameter rod has 6" bend radius and is recommended for 2"- 4" conduit.

The Schonstedt GA-52Cx Magnetic Locator detects iron and steel objects underground, such as USTs, buried oil wells and buried metal monitoring well lids. The Schonstedt GA-52Cx Magnetometer provides audio detection signals with frequencies that vary with gradient field intensity. The signals peak in frequency when the locator's tip is held directly over the target.

SITE AREA

The project site is located on north side of South St. between Atlantic Ave. & Linden Ave. in Long Beach, CA. Below is a marked-up aerial view of the site.



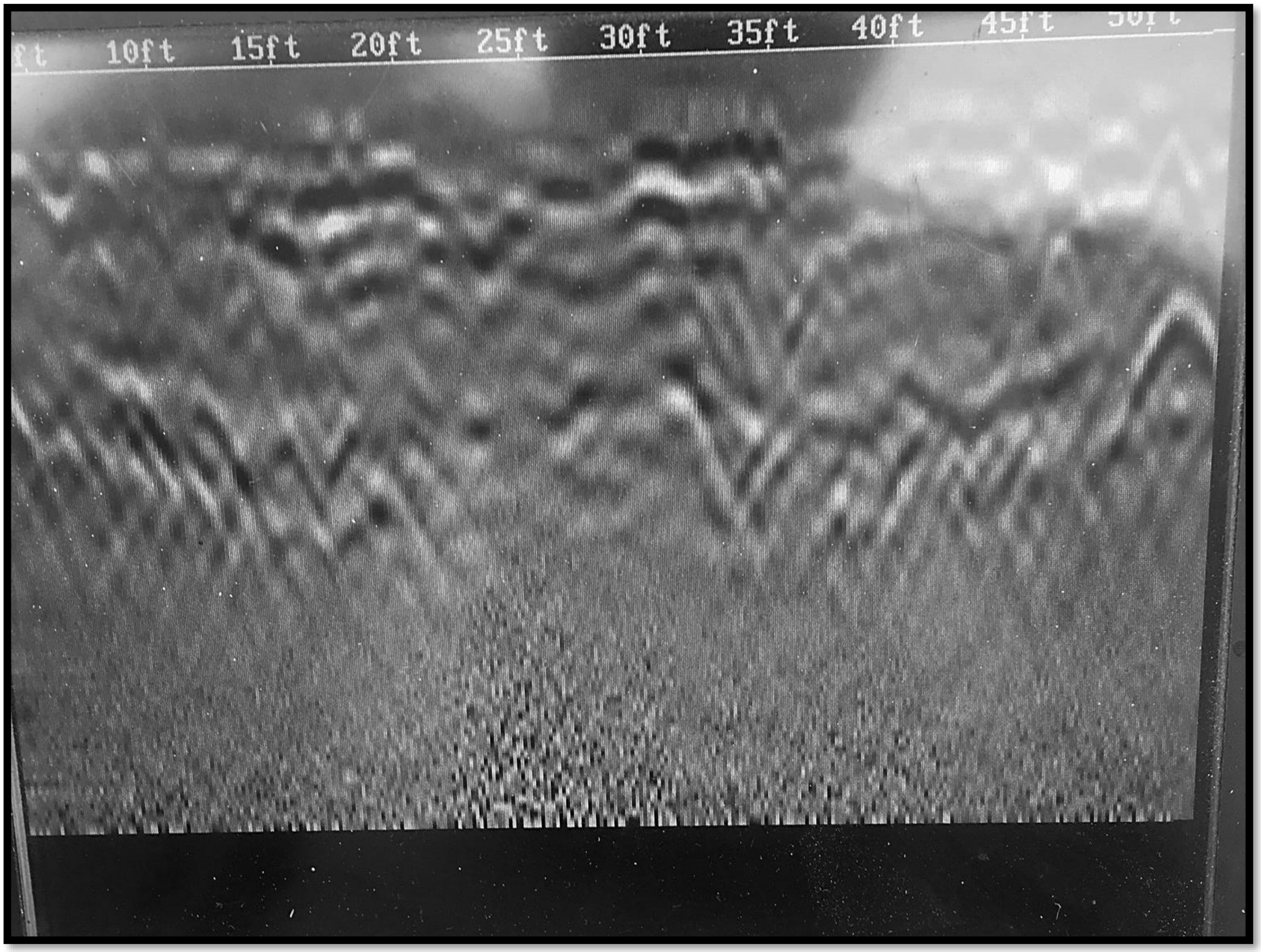
ANALYSES / INTERPRETATIONS AND FINDINGS

Our technician performed a Subsurface Utility Investigation using Electro-Magnetic & Ground Penetrating Radar locating equipment to locate and confirm all accessible underground utilities within the project areas on-site for 9 proposed soil boring locations. Our technician also performed a sweep & scan with GPR and a Magnetometer to attempt to identify any anomalies that show the signature of an existing Underground Storage Tank or evidence of excavation/removal.

Our technician found and marked-out an approximately 10' x 10' anomaly on-site that resembles a potential area of excavation. The area was marked with white paint. All other utilities were marked-out with color coded marking paint.

Below are is a photo of the marked-out findings:

Below is a GPR image of the anomaly:



Field work performed by Richard Carroll,
EM & GPR Technician,
Pacific Coast Locators, Inc.

LIMITATIONS

Please be advised that there are limitations to any Subsurface Investigation. The equipment may not achieve maximum effectiveness due to soil conditions, above ground obstructions, reinforced concrete, and a variety of other factors. No Subsurface Investigation or equipment can provide a complete image of buried features. Our results should always be used in conjunction with as many methods as possible including: Consultation of existing plans and drawings, exploratory excavation or potholing, visual inspection of above ground features and utilization of services such as Dig Alert/Underground Service.

APPENDIX B

Laboratory Data Sheets

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

October 22, 2020

Joshua Sargent
Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Report No.: 2010199
Project Name: 185804904 - Brandywine Homes

Dear Joshua Sargent,

This report contains the analytical results for the sample(s) received under chain of custody(s) by Positive Lab Service on October 16, 2020.

The test results in this report are performed in compliance with ELAP accreditation requirements for the certified parameters. The laboratory report may not be produced, except in full, without the written approval of the laboratory.

The issuance of the final Certificate of Analysis takes precedence over any previous Preliminary Report. Preliminary data should not be used for regulatory purposes. Authorized signature(s) is provided on final report only.

If you have any questions in reference to this report, please contact your Positive Lab Service coordinator.

Project Manager

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Project: 185804904 - Brandywine Homes

Sample ID: SB-01-1 Soil (2010199-01) Sampled: 10/16/20 07:30 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**9.69**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-01-1 Soil (2010199-02) Sampled: 10/16/20 07:48 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**7.45**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-02-1 Soil (2010199-03) Sampled: 10/16/20 08:15 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**6.58**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-02-1 Soil (2010199-04) Sampled: 10/16/20 08:30 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**15.5**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-03-1 Soil (2010199-05) Sampled: 10/16/20 08:50 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**23.6**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-03-1 Soil (2010199-06) Sampled: 10/16/20 09:00 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**16.3**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-04-1 Soil (2010199-07) Sampled: 10/16/20 09:25 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**15.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-04-1 Soil (2010199-08) Sampled: 10/16/20 09:45 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**22.4**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-07-1 Soil (2010199-09) Sampled: 10/16/20 10:10 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**5.13**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-07-3 Soil (2010199-10) Sampled: 10/16/20 10:12 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**6.56**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-07-10 Soil (2010199-11) Sampled: 10/16/20 10:20 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015B	10/19/20	10/19/20	lk	BJ01938
Surrogate: a,a,a-Trifluorotoluene	*102 %*			*70-148*		*EPA 5030B*	*EPA 8015B*	*10/19/20*	*10/19/20*	*lk*	*BJ01938*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	**2.90**	H-2	1	mg/kg	2.50	EPA 3550C	EPA 8015B	10/20/20	10/21/20	lk	BJ02020
TPH C23 - C40	ND		1	mg/kg	100	EPA 3550C	EPA 8015B	10/20/20	10/21/20	lk	BJ02020
Surrogate: n-Tetracosane	*103 %*			*64-139*		*EPA 3550C*	*EPA 8015B*	*10/20/20*	*10/21/20*	*lk*	*BJ02020*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Sample ID: SB-07-10 Soil (2010199-11) Sampled: 10/16/20 10:20 Received: 10/16/20 13:40

Chloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Vinyl chloride (Chloroethylene)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromomethane (Methyl bromide)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Trichlorofluoromethane (FC-11)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethanol	ND	1	ug/kg	500	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloroethene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Carbon disulfide	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Methylene chloride (Dichloromethane)	ND	1	ug/kg	20.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Acetone	ND	1	ug/kg	80.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
trans-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Methyl tert-butyl ether (MTBE)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Tert-butyl alcohol	ND	1	ug/kg	20.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Di-isopropyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethyl tert-butyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Vinyl acetate	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chloroform	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Benzene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Dibromomethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Toluene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
o-Xylene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Styrene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Project: 185804904 - Brandywine Homes

Sample ID: SB-07-10 Soil (2010199-11) Sampled: 10/16/20 10:20 Received: 10/16/20 13:40

Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Naphthalene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Surrogate: Dibromofluoromethane	*89.7 %*			*70-138*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*
Surrogate: Toluene-d8	*98.7 %*			*80-121*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*
Surrogate: 4-Bromofluorobenzene	*96.1 %*			*70-122*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*

Sample ID: SB-07-15 Soil (2010199-12) Sampled: 10/16/20 10:25 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015B	10/19/20	10/19/20	lk	BJ01938
Surrogate: a,a,a-Trifluorotoluene	*92.8 %*			*70-148*		*EPA 5030B*	*EPA 8015B*	*10/19/20*	*10/19/20*	*lk*	*BJ01938*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015B	10/20/20	10/20/20	lk	BJ02020
TPH C23 - C40	ND		1	mg/kg	100	EPA 3550C	EPA 8015B	10/20/20	10/20/20	lk	BJ02020
Surrogate: n-Tetracosane	*87.5 %*			*64-139*		*EPA 3550C*	*EPA 8015B*	*10/20/20*	*10/20/20*	*lk*	*BJ02020*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chloromethane	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chloroethane	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethanol	ND		1	ug/kg	500	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Acetone	ND		1	ug/kg	80.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Sample ID: SB-07-15 Soil (2010199-12) Sampled: 10/16/20 10:25 Received: 10/16/20 13:40

Tert-butyl alcohol	ND	1	ug/kg	20.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Di-isopropyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethyl tert-butyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Vinyl acetate	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chloroform	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Benzene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Dibromomethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Toluene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
o-Xylene	ND	1	ug/kg	2.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Styrene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Bromobenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
2-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3,5-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
4-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
tert-Butylbenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,4-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
sec-Butylbenzene	ND	1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Sample ID: SB-07-15 Soil (2010199-12) Sampled: 10/16/20 10:25 Received: 10/16/20 13:40

4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Naphthalene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5030B	EPA 8260B	10/19/20	10/19/20	mb	BJ01927
Surrogate: Dibromofluoromethane	*95.9 %*			*70-138*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*
Surrogate: Toluene-d8	*98.1 %*			*80-121*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*
Surrogate: 4-Bromofluorobenzene	*97.3 %*			*70-122*		*EPA 5030B*	*EPA 8260B*	*10/19/20*	*10/19/20*	*mb*	*BJ01927*

Sample ID: SB-08-1 Soil (2010199-13) Sampled: 10/16/20 10:40 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**11.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-08-3 Soil (2010199-14) Sampled: 10/16/20 10:42 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**36.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-06-1 Soil (2010199-15) Sampled: 10/16/20 11:04 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**328**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-06-3 Soil (2010199-16) Sampled: 10/16/20 11:06 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**5.89**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-07-1 Soil (2010199-17) Sampled: 10/16/20 11:20 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**30.5**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: HA-07-3 Soil (2010199-18) Sampled: 10/16/20 11:25 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**43.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-09-1 Soil (2010199-19) Sampled: 10/16/20 11:10 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**115**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-09-3 Soil (2010199-20) Sampled: 10/16/20 11:12 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**74.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-05-1 Soil (2010199-21) Sampled: 10/16/20 11:38 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**5.37**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-05-3 Soil (2010199-22) Sampled: 10/16/20 11:40 Received: 10/16/20 13:40

Certificate of Analysis

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Sample ID: SB-05-3 Soil (2010199-22) Sampled: 10/16/20 11:40 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**6.95**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02131

Sample ID: SB-06-1 Soil (2010199-23) Sampled: 10/16/20 11:55 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**146**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Sample ID: SB-06-3 Soil (2010199-24) Sampled: 10/16/20 11:58 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**33.7**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Sample ID: HA-09-1 Soil (2010199-25) Sampled: 10/16/20 12:15 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**42.3**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Sample ID: HA-08-1 Soil (2010199-26) Sampled: 10/16/20 12:26 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**196**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Sample ID: HA-08-3 Soil (2010199-27) Sampled: 10/16/20 12:28 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**7.17**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Sample ID: HA-05-1 Soil (2010199-28) Sampled: 10/16/20 12:40 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**1210**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/19/20	10/20/20	CG	BJ02132

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte		Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ01938 - EPA 5030B											
Blank		**Prepared & Analyzed: 10/19/20**									
TPH C4 - C12		ND	0.500	mg/kg							
Surrogate: a,a,a-Trifluorotoluene		*0.0261*		mg/kg	*0.03000*		*86.9*	*70-148*			
LCS		**Prepared & Analyzed: 10/19/20**									
Gasoline		0.794	0.500	mg/kg	0.9096		87.3	69-120			
LCS		**Prepared & Analyzed: 10/20/20**									
Gasoline		0.786	0.500	mg/kg	0.9096		86.5	69-120			
Matrix Spike	**Source: 2010199-11**	**Prepared & Analyzed: 10/19/20**									
Gasoline		1.56	0.500	mg/kg	1.819	ND	85.9	60-132			
Matrix Spike Dup	**Source: 2010199-11**	**Prepared & Analyzed: 10/19/20**									
Gasoline		1.59	0.500	mg/kg	1.819	ND	87.2	60-132	1.54	30	
Batch BJ02020 - EPA 3550C											
Blank		**Prepared & Analyzed: 10/20/20**									
TPH C13 - C22		ND	2.50	mg/kg							
TPH C23 - C40		ND	100	mg/kg							
Surrogate: n-Tetracosane		*18.5*		mg/kg	*20.83*		*88.7*	*64-139*			
LCS		**Prepared & Analyzed: 10/20/20**									
Diesel		483	12.5	mg/kg	554.7		87.0	74-154			
Surrogate: n-Tetracosane		*19.7*		mg/kg	*20.83*		*94.8*	*64-140*			
Matrix Spike	**Source: 2010199-12**	**Prepared & Analyzed: 10/20/20**									
Diesel		96.5	2.50	mg/kg	110.9	ND	87.0	53-138			
Surrogate: n-Tetracosane		*19.6*		mg/kg	*20.83*		*93.8*	*68-139*			
Matrix Spike Dup	**Source: 2010199-12**	**Prepared & Analyzed: 10/20/20**									
Diesel		101	2.50	mg/kg	110.9	ND	90.7	53-138	4.17	30	
Surrogate: n-Tetracosane		*20.2*		mg/kg	*20.83*		*97.1*	*68-139*			
Batch BJ01927 - EPA 5030B											
Blank		**Prepared & Analyzed: 10/19/20**									
Dichlorodifluoromethane (FC-12)		ND	4.00	ug/kg							
Chloromethane		ND	4.00	ug/kg							
Vinyl chloride (Chloroethylene)		ND	4.00	ug/kg							
Bromomethane (Methyl bromide)		ND	4.00	ug/kg							
Chloroethane		ND	4.00	ug/kg							
Trichlorofluoromethane (FC-11)		ND	4.00	ug/kg							
Ethanol		ND	500	ug/kg							
1,1-Dichloroethene		ND	4.00	ug/kg							
Carbon disulfide		ND	40.0	ug/kg							
Methylene chloride (Dichloromethane)		ND	20.0	ug/kg							

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ01927 - EPA 5030B										
Acetone	ND	80.0	ug/kg							
trans-1,2-Dichloroethene	ND	4.00	ug/kg							
Methyl tert-butyl ether (MTBE)	ND	4.00	ug/kg							
Tert-butyl alcohol	ND	20.0	ug/kg							
Di-isopropyl ether	ND	4.00	ug/kg							
1,1-Dichloroethane	ND	4.00	ug/kg							
Ethyl tert-butyl ether	ND	4.00	ug/kg							
Vinyl acetate	ND	40.0	ug/kg							
2,2-Dichloropropane	ND	4.00	ug/kg							
cis-1,2-Dichloroethene	ND	4.00	ug/kg							
Bromochloromethane	ND	4.00	ug/kg							
Chloroform	ND	4.00	ug/kg							
Carbon tetrachloride	ND	4.00	ug/kg							
1,1,1-Trichloroethane	ND	4.00	ug/kg							
1,1-Dichloropropene	ND	4.00	ug/kg							
2-Butanone (MEK)	ND	40.0	ug/kg							
Benzene	ND	2.00	ug/kg							
Tert-amyl methyl ether	ND	4.00	ug/kg							
1,2-Dichloroethane	ND	4.00	ug/kg							
Trichloroethene (TCE)	ND	4.00	ug/kg							
Dibromomethane	ND	4.00	ug/kg							
1,2-Dichloropropane	ND	4.00	ug/kg							
Bromodichloromethane	ND	4.00	ug/kg							
1,4-Dioxane	ND	80.0	ug/kg							
2-Chloroethyl vinyl ether	ND	40.0	ug/kg							
cis-1,3-Dichloropropene	ND	4.00	ug/kg							
Toluene	ND	2.00	ug/kg							
Tetrachloroethene (PCE)	ND	4.00	ug/kg							
4-Methyl-2-pentanone (MIBK)	ND	40.0	ug/kg							
trans-1,3-Dichloropropene	ND	4.00	ug/kg							
1,1,2-Trichloroethane	ND	4.00	ug/kg							
Dibromochloromethane	ND	4.00	ug/kg							
1,3-Dichloropropane	ND	4.00	ug/kg							
1,2-Dibromoethane (EDB)	ND	4.00	ug/kg							
2-Hexanone (MBK)	ND	40.0	ug/kg							
Chlorobenzene	ND	4.00	ug/kg							
Ethylbenzene	ND	2.00	ug/kg							
1,1,1,2-Tetrachloroethane	ND	4.00	ug/kg							
m,p-Xylene	ND	2.00	ug/kg							
o-Xylene	ND	2.00	ug/kg							
Styrene	ND	4.00	ug/kg							

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ01927 - EPA 5030B										
Bromoform (Tribromomethane)	ND	4.00	ug/kg							
Isopropylbenzene (Cumene)	ND	4.00	ug/kg							
Bromobenzene	ND	4.00	ug/kg							
n-Propylbenzene	ND	4.00	ug/kg							
1,1,2,2-Tetrachloroethane	ND	4.00	ug/kg							
2-Chlorotoluene	ND	4.00	ug/kg							
1,2,3-Trichloropropane	ND	4.00	ug/kg							
1,3,5-Trimethylbenzene	ND	4.00	ug/kg							
4-Chlorotoluene	ND	4.00	ug/kg							
tert-Butylbenzene	ND	4.00	ug/kg							
1,2,4-Trimethylbenzene	ND	4.00	ug/kg							
sec-Butylbenzene	ND	4.00	ug/kg							
4-Isopropyltoluene	ND	4.00	ug/kg							
1,3-Dichlorobenzene	ND	4.00	ug/kg							
1,4-Dichlorobenzene	ND	4.00	ug/kg							
n-Butylbenzene	ND	4.00	ug/kg							
1,2-Dichlorobenzene	ND	4.00	ug/kg							
1,2-Dibromo-3-chloropropane (DBCP)	ND	4.00	ug/kg							
1,2,4-Trichlorobenzene	ND	4.00	ug/kg							
Hexachlorobutadiene	ND	4.00	ug/kg							
Naphthalene	ND	4.00	ug/kg							
1,2,3-Trichlorobenzene	ND	4.00	ug/kg							
Surrogate: Dibromofluoromethane	*14.1*		ug/kg	*15.00*		*94.2*	*70-138*			
Surrogate: Toluene-d8	*14.4*		ug/kg	*15.00*		*95.8*	*80-121*			
Surrogate: 4-Bromofluorobenzene	*13.8*		ug/kg	*15.00*		*92.1*	*70-122*			
LCS	**Prepared & Analyzed: 10/19/20**									
1,1-Dichloroethene	18.3	4.00	ug/kg	20.00		91.3	63-137			
Methyl tert-butyl ether (MTBE)	17.0	4.00	ug/kg	20.00		85.0	70-127			
Benzene	17.2	2.00	ug/kg	20.00		86.2	70-120			
Trichloroethene (TCE)	19.1	4.00	ug/kg	20.00		95.6	72-120			
Toluene	17.8	2.00	ug/kg	20.00		89.2	66-122			
Chlorobenzene	17.5	4.00	ug/kg	20.00		87.4	72-120			
Surrogate: Dibromofluoromethane	*14.5*		ug/kg	*15.00*		*96.8*	*80-120*			
Surrogate: Toluene-d8	*15.1*		ug/kg	*15.00*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*14.4*		ug/kg	*15.00*		*96.0*	*80-120*			
LCS Dup	**Prepared & Analyzed: 10/19/20**									
1,1-Dichloroethene	21.5	4.00	ug/kg	20.00		107	63-137	16.2	20	
Methyl tert-butyl ether (MTBE)	20.0	4.00	ug/kg	20.00		100	70-127	16.3	20	
Benzene	20.2	2.00	ug/kg	20.00		101	70-120	15.8	20	
Trichloroethene (TCE)	21.7	4.00	ug/kg	20.00		108	72-120	12.6	20	
Toluene	20.2	2.00	ug/kg	20.00		101	66-122	12.2	20	

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ01927 - EPA 5030B										
Chlorobenzene	20.0	4.00	ug/kg	20.00		100	72-120	13.6	20	
Surrogate: Dibromofluoromethane	*14.3*		ug/kg	*15.00*		*95.1*	*80-120*			
Surrogate: Toluene-d8	*14.6*		ug/kg	*15.00*		*97.7*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*14.6*		ug/kg	*15.00*		*97.5*	*80-120*			
Matrix Spike **Source: 2010199-11**	**Prepared & Analyzed: 10/19/20**									
1,1-Dichloroethene	19.6	4.00	ug/kg	20.00	ND	97.8	61-136			
Benzene	17.9	2.00	ug/kg	20.00	ND	89.7	65-123			
Trichloroethene (TCE)	20.1	4.00	ug/kg	20.00	ND	101	65-120			
Toluene	17.9	2.00	ug/kg	20.00	ND	89.6	59-120			
Chlorobenzene	17.2	4.00	ug/kg	20.00	ND	85.8	56-123			
Surrogate: Dibromofluoromethane	*14.1*		ug/kg	*15.00*		*94.2*	*80-126*			
Surrogate: Toluene-d8	*14.6*		ug/kg	*15.00*		*97.6*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*14.5*		ug/kg	*15.00*		*96.5*	*80-120*			
Matrix Spike Dup **Source: 2010199-11**	**Prepared & Analyzed: 10/19/20**									
1,1-Dichloroethene	20.4	4.00	ug/kg	20.00	ND	102	61-136	4.25	30	
Benzene	19.0	2.00	ug/kg	20.00	ND	94.8	65-123	5.58	30	
Trichloroethene (TCE)	21.9	4.00	ug/kg	20.00	ND	109	65-120	8.48	30	
Toluene	19.6	2.00	ug/kg	20.00	ND	98.2	59-120	9.10	30	
Chlorobenzene	18.9	4.00	ug/kg	20.00	ND	94.6	56-123	9.70	30	
Surrogate: Dibromofluoromethane	*14.1*		ug/kg	*15.00*		*93.8*	*80-126*			
Surrogate: Toluene-d8	*15.2*		ug/kg	*15.00*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*14.6*		ug/kg	*15.00*		*97.5*	*80-120*			
Batch BJ02131 - EPA 3050B										
Blank	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	ND	1.00	mg/kg							
LCS	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	52.5	1.00	mg/kg	50.20		104	80-120			
Matrix Spike **Source: 2010199-02**	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	52.0	1.00	mg/kg	50.20	7.45	88.7	75-125			
Matrix Spike Dup **Source: 2010199-02**	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	53.9	1.00	mg/kg	50.20	7.45	92.6	75-125	4.29	30	
Batch BJ02132 - EPA 3050B										
Blank	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	ND	1.00	mg/kg							
LCS	**Prepared: 10/19/20 Analyzed: 10/20/20**									
Lead	52.3	1.00	mg/kg	50.20		104	80-120			
Matrix Spike **Source: 2010199-23**	**Prepared: 10/19/20 Analyzed: 10/20/20**									

Certificate of Analysis

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

File #:75588
Report Date: 10/22/20
Submitted: 10/16/20
PLS Report No.: 2010199

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ02132 - EPA 3050B										
Lead	198	1.00	mg/kg	50.20	146	103	75-125			
Matrix Spike Dup **Source: 2010199-23**	**Prepared: 10/19/20**	**Analyzed: 10/20/20**								
Lead	192	1.00	mg/kg	50.20	146	90.5	75-125	13.3	30	

Notes and Definitions

H-2	A single peak was present in the HC range.
NA	Not Applicable
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
MDL	Method Detection Limit
PQL	Practical Quantitation Limit

Environmental Laboratory Accreditation Program Certificate No. 1131, Mobile Lab No. 2534, LACSD No. 10138

Authorized Signature(s)

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 1 of 6

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Direct Bill to Brandywine Homes

Laboratory: Positive Labs 20|0199

Project Manager: Joshua Sargent
Email Address: Joshua.Sargent@stantec.com
Sampler: J. Sargent Joshua.Sargent@Stantec.com

Phone Number:909-335-6116
Fax Number:909-335-6120

							Analysis Required									
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions
SB-01-1	Soil	8oz	1	10.16.20	0730	ICE	x									
SB-01 -3					0735			x								
SB-01 -5					0745			x								
HA-01-1					0748		x									
HA-01 -3					0750			x								
HA-01 -5					0755			x								
SB-02-1					0815		x									
SB-02-3					0817			x								
SB-02-5					0820			x								
HA-02-1					0830		x									
HA-02-3					0835			x								
HA-02-5					0840			x								

Relinquished By:	Date/Time: 10.16.20 1540	Received By: TJ	Date/Time: 10/16/20 1540	Turn-Around Time: Same day 72 hours
Relinquished By:	Date/Time: 10/19/20 0630	Received By:	Date/Time: 10.19.20 @ 6:30	24 hour 5 days
				48 hour [✓ normal]
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time:	Sample Integrity: (Check) intact ____ on ice 2.6°C

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

CHAIN OF CUSTODY FORM

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

Page 2 of 6

2010199

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Direct Bill to Brandywine Homes

Laboratory: Positive Labs

Project Manager: Joshua Sargent
Email Address:

Phone Number:909-335-6116

Fax Number:909-335-6120

Sampler: J. Sargent Joshua.Sargent@Stantec.com

							Analysis Required		
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD	Special Instructions
SB-03-1	Soil	8 oz	1	10.16.20	0850	ICE	X		
SB-03-3					0853			X	
SB-03-5					0855			X	
HA-03-1					0900		X		
HA-03-3					0903			X	
HA-03-5					0905			X	
SB-04-1					0925		X		
SB-04-3					0928			X	
SB-04-5					0930			X	
HA-04-1					0945		X		
HA-04-3					1005			X	
HA-04-5					1007			X	

Relinquished By: Joshua Sargent Date/Time: 10.16.20 1340 Received By: Date/Time: 10.16.20 1340

Relinquished By: Date/Time: 10.19.20 0630 Received By: Date/Time: 10.19.20/6:30

Relinquished By: Date/Time: Received in Lab By: Date/Time:

Turn-Around Time: Same day 72 hours
24 hour 5 days
48 hour [✓ normal]

Sample Integrity: (Check)
intact ______ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

CHAIN OF CUSTODY FORM

25864-F-Business Center Dr., Redlands, CA 92374 (909)335-6116, Fax (909) 335-6120

Page 3 of 6

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Bill to Brandywine Homes

Laboratory: Positive Labs 2010199

Project Manager: Joshua Sargent
Email Address:

Phone Number:909-335-6116

Fax Number:909-335-6120

Sampler: J. Sargent Joshua.Sargent@Stantec.com

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	TPH (g,d,o) 8015	VOC Full Scan 8260B	HOLD						Special Instructions
SB-07-1	Soil	8 oz	1	10.16.20	1010	ICE	X									
SB-07-3		8 oz			1012		X			~~X~~						
SB-07-5		8 oz			1015					X						
SB-07-10		Acetate			1020			X	X							
SB-07-15					1025			X	X							
SB-08-1		8 oz			1040		X									
SB-08-3		8 oz			1042		X			~~X~~						
SB-08-5		~~Acetate~~ 8oz			1045					X						
SB-08-10		Acetate			1050					X						
SB-08-15					1055					X						

Relinquished By: Date/Time: 10.16.20 1340
Received By: Date/Time: 10-16-20 1340
Relinquished By: Date/Time: 10.19.20 0830
Received By: Date/Time: 10.19.20/6:30
Relinquished By: Date/Time:
Received in Lab By: Date/Time:

Turn-Around Time: Same day 24 hour 48 hour 72 hours 5 days [✓ normal]

Sample Integrity: (Check)
intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

CHAIN OF CUSTODY FORM

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

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W10199

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904 Direct Bill to Brandywine Homes

Laboratory: Positive Labs

Project Manager: Joshua Sargent
Email Address:

Phone Number:909-335-6116

Fax Number:909-335-6120

Sampler: J. Sargent Joshua.Sargent@Stantec.com

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions
HA-06-1	Soil	8oz	1	10.16.20	1104	ICE	X									
HA-06-3		8oz			1106		X	~~X~~								
HA-06-5		8oz			1108			X								
HA-07-1		8oz			1120		X									
HA-07-3					1125		X	~~X~~								
HA-07-5					1130			X								
SB-09-1					1110		X									
SB-09-3					1112		X									
SB-09-5					1115			X								
SB-09-10		~~Acetate~~			1122			X								
SB-09-15					1126			X								

Relinquished By:	Date/Time: 10.16.20 1340	Received By: JS	Date/Time: 10/16/20 1340
Relinquished By:	Date/Time: 10/19/20 0630	Received By:	Date/Time: 10.19.20 / 6:30
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time:

Turn-Around Time: Same day 72 hours
24 hour 5 days
48 hour normal

Sample Integrity: (Check)
intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

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735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 5 of 6

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Direct Bill to Brandywine Homes

Laboratory: Positive Labs 2010199

Project Manager: Joshua Sargent
Email Address:

Phone Number: 909-335-6116

Sampler: J. Sargent Joshua.Sargent@Stantec.com

Fax Number: 909-335-6120

							Analysis Required									
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions
SB-05-1	Soil	8oz	1	10.16.20	1138	ICE	x									
SB-05-3		8oz			1140		x	~~x~~								
SB-05-5		8oz			1142			x								
SB-05-10		Acetate			1146			x								
SB-05-15		Acetate			1148			x								
SB-06-1		8oz			1155		x									
SB-06-3					1158		x	~~x~~								
SB-06-5					1200			x								
SB-06-10		Acetate			1205			x								
SB-06-15					1210			x								
HA-09-1		8oz			1215		x									

Relinquished By: Date/Time: 10.16.20 1340
Received By: T Date/Time: 10/16/20 1340

Relinquished By: T Date/Time: 10.19.20 0630
Received By: Date/Time:

Relinquished By: Date/Time:
Received in Lab By: Date/Time: 10.19.20 10:30

Turn-Around Time:
Same day 72 hours
24 hour 5 days
48 hour [✓ normal]

Sample Integrity: (Check)
intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 6 of 6

2010199

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904

Laboratory: Positive Labs

Project Manager: Joshua Sargent
Email Address:
Sampler: J. Sargent Joshua.Sargent@Stantec.com

Phone Number:909-335-6116
Fax Number:909-335-6120

							Analysis Required									
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions
HA-08-1	Soil	8oz	1	10.16.20	1226	ICE	X									
HA-08-3					1228		X	~~X~~								
HA-08-5					1230			X								
HA-05-1					1240		X									
HA-05-3					1242			X								
HA-05-5					1245			X								

Relinquished By: Date/Time: 10.16.20 1340 Received By: Date/Time: 10-16-20 1340
Relinquished By: Date/Time: 10/19/20 0830 Received By: Date/Time: 10.19.20 / 10:30
Relinquished By: Date/Time: Received in Lab By: Date/Time:

Turn-Around Time: Same day 72 hours
24 hour 5 days
48 hour [✓ normal]

Sample Integrity: (Check)
intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

POSITIVE
LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

October 29, 2020

Joshua Sargent
Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Report No.: 2010199
Project Name: 185804904 - Brandywine Homes

Dear Joshua Sargent,

This report contains the analytical results for the sample(s) received under chain of custody(s) by Positive Lab Service on October 16, 2020.

The test results in this report are performed in compliance with ELAP accreditation requirements for the certified parameters. The laboratory report may not be produced, except in full, without the written approval of the laboratory.

The issuance of the final Certificate of Analysis takes precedence over any previous Preliminary Report. Preliminary data should not be used for regulatory purposes. Authorized signature(s) is provided on final report only.

If you have any questions in reference to this report, please contact your Positive Lab Service coordinator.

Project Manager

Certificate of Analysis

File #:75588
Report Date: 10/29/20
Submitted: 10/16/20
PLS Report No.: 2010199

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Sample ID: HA-06-1 Soil (2010199-15) Sampled: 10/16/20 11:04 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**31.7**		1	mg/L	0.500	DHS WET	EPA 6010B	10/26/20	10/28/20	cg	BJ02839

Sample ID: SB-06-1 Soil (2010199-23) Sampled: 10/16/20 11:55 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**8.42**		1	mg/L	0.500	DHS WET	EPA 6010B	10/26/20	10/28/20	cg	BJ02839

Sample ID: HA-08-1 Soil (2010199-26) Sampled: 10/16/20 12:26 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**16.3**		1	mg/L	0.500	DHS WET	EPA 6010B	10/26/20	10/28/20	cg	BJ02839

Sample ID: HA-05-1 Soil (2010199-28) Sampled: 10/16/20 12:40 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**1.42**		1	mg/L	0.500	EPA 1311	EPA 6010B	10/26/20	10/28/20	CG	BJ02834

Sample ID: HA-05-3 Soil (2010199-29) Sampled: 10/16/20 12:42 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**6.83**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/27/20	10/27/20	CG	BJ02831

Sample ID: HA-05-5 Soil (2010199-30) Sampled: 10/16/20 12:45 Received: 10/16/20 13:40

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead	**6.14**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	10/27/20	10/27/20	CG	BJ02831

Certificate of Analysis

File #:75588
Report Date: 10/29/20
Submitted: 10/16/20
PLS Report No.: 2010199

Stantec [San Bernardino]
735 E Carnegie Dr Suite 280
San Bernardino, CA 92408

Attn: Joshua Sargent Phone: (909) 335-6116 FAX:

Project: 185804904 - Brandywine Homes

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BJ02831 - EPA 3050B										
Blank	**Prepared & Analyzed: 10/27/20**									
Lead	ND	1.00	mg/kg							
LCS	**Prepared & Analyzed: 10/27/20**									
Lead	56.4	1.00	mg/kg	50.20		112	80-120			
Matrix Spike **Source: 2010260-01**	**Prepared & Analyzed: 10/27/20**									
Lead	60.8	5.00	mg/kg	50.20	5.58	110	75-125			
Matrix Spike Dup **Source: 2010260-01**	**Prepared & Analyzed: 10/27/20**									
Lead	60.6	5.00	mg/kg	50.20	5.58	110	75-125	0.349	30	
Batch BJ02839 - DHS WET										
Blank	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	ND	0.500	mg/L							
LCS	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	4.92	0.500	mg/L	5.020		98.0	80-120			
Duplicate **Source: 2010207-01**	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	68.0	0.500	mg/L		57.7			16.3	30	
Post Spike **Source: 2010207-01**	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	61.5		mg/L	5.020	57.7	74.7	70-130			
Batch BJ02834 - EPA 1311										
Blank	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	ND	0.500	mg/L							
LCS	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	2.59	0.500	mg/L	2.510		103	80-120			
Duplicate **Source: 2010219-02**	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	ND	0.500	mg/L		ND				30	
Post Spike **Source: 2010219-02**	**Prepared: 10/26/20 Analyzed: 10/28/20**									
Lead	2.54		mg/L	2.510	-0.00862	101	70-130			

Notes and Definitions

NA	Not Applicable
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
MDL	Method Detection Limit
PQL	Practical Quantitation Limit

Environmental Laboratory Accreditation Program Certificate No. 1131, Mobile Lab No. 2534, LACSD No. 10138

Authorized Signature(s)

Stantec

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 1 of 6

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Direct Bill to Brandywine Homes

Laboratory: Positive Labs 20J0199

Project Manager: Joshua Sargent
Email Address: Joshua.Sargent@stantec.com
Sampler: J. Sargent Joshua.Sargent@Stantec.com

Phone Number:909-335-6116
Fax Number:909-335-6120

							Analysis Required									
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions / Add on & off Hold per J. Sargent 10/20/20@ 9:35AM via email. on a 72 Hr TAT Rush.
SB-01-1	Soil	8oz	1	10.16.20	0730	ICE	X									
SB-01 -3					0735			X								
SB-01 -5					0745			X								
HA-01-1					0748		X									
HA-01 -3					0750			X								
HA-01 -5					0755			X								
SB-02-1					0815		X									
SB-02-3					0817			X								
SB-02-5					0820			X								
HA-02-1					0830		X									
HA-02-3					0835			X								
HA-02-5					0840			X								

Relinquished By: Date/Time: 10.16.20 1540
Received By: TS Date/Time: 10/16/20 1540

Relinquished By: Date/Time: 10.19.20 0630
Received By: Date/Time: 10.19.20 @ 6:30

Relinquished By: Date/Time:
Received in Lab By: Date/Time:

Turn-Around Time: Same day 72 hours 24 hour 5 days 48 hour [✓ normal]

Sample Integrity: (Check)
intact ________ on ice 2.6°C

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 2 of 6

2010199

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Direct Bill to Brandywine Homes

Laboratory: Positive Labs

Project Manager: Joshua Sargent
Email Address:

Phone Number:909-335-6116

Fax Number:909-335-6120

Sampler: J. Sargent Joshua.Sargent@Stantec.com

Analysis Required

10/26/20 / See pg 1 of 6

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD								Special Instructions
SB-03-1	Soil	8oz	1	10.16.20	0850	ICE	X									
SB-03-3					0853			X								
SB-03-5					0855			X								
HA-03-1					0900		X									
HA-03-3					0903			X								
HA-03-5					0905			X								
SB-04-1					0925		X									
SB-04-3					0928			X								
SB-04-5					0930			X								
HA-04-1					0945		X									
HA-04-3					1005			X								
HA-04-5					1007			X								

Relinquished By:	Date/Time: 10.16.20 1340	Received By:	Date/Time: 10.16.20 1340	Turn-Around Time: Same day 72 hours
Relinquished By:	Date/Time: 10.19.20 0630	Received By:	Date/Time: 10.19.20/6:30	24 hour 5 days 48 hour [✓ normal]
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time:	Sample Integrity: (Check) intact ______ on ice ___

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

CHAIN OF CUSTODY FORM

25864-F-Business Center Dr., Redlands, CA 92374 (909)335-6116, Fax (909) 335-6120

Page 3 of 6

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904
Bill to Brandywine Homes

Laboratory: Positive Labs 2010199

Project Manager: Joshua Sargent
Email Address:
Sampler: J. Sargent Joshua.Sargent@Stantec.com

Phone Number:909-335-6116
Fax Number:909-335-6120

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	TPH (g,d,o) 8015	VOC Full Scan 8260B	HOLD					Special Instructions
															10/26/20 / see pg 1 of 6
SB-07-1	Soil	8oz	1	10.16.20	1010	ICE	X								
SB-07-3		8oz			1012		X			~~X~~					
SB-07-5		8oz			1015					X					
SB-07-10		Acetate			1020			X	X						
SB-07-15					1025			X	X						
SB-08-1		8oz			1040		X								
SB-08-3		8oz			1042		X			~~X~~					
SB-08-5		~~Acetate~~ 8oz			1045					X					
SB-08-10		Acetate			1050					X					
SB-08-15					1055					X					

Relinquished By: Date/Time: 10.16.20 1340

Received By: Date/Time: 10.16.20 1340

Relinquished By: Date/Time: 10.19.20 0830

Received By: Date/Time: 10.19.20/6:30

Relinquished By: Date/Time:

Received in Lab By: Date/Time:

Turn-Around Time: Same day 24 hour 48 hour 72 hours 5 days [✓ normal]

Sample Integrity: (Check)
intact ________ on ice ___

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

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735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 4 of 6

Client Name/Address: Stantec 735 E. Carnegie Drive, Suite 280 San Bernardino, CA 92408	Project/PO Number: 185804904 Direct Bill to Brandywine Homes
Project Manager: Joshua Sargent Email Address: Sampler: J. Sargent Joshua.Sargent@Stantec.com	Phone Number:909-335-6116 Fax Number:909-335-6120

Laboratory: Positive Labs 2010199

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD	STLC Lead 6010 10/26/20							Special Instructions 10/26/20 / See pg 1 of 6
HA-06-1	Soil	8oz	1	10.16.20	1104	ICE	X		/							
HA-06-3		8oz			1106		X	~~X~~								
HA-06-5		8oz			1108			X								
HA-07-1		8oz			1120		X									
HA-07-3					1125		X	~~X~~								
HA-07-5					1130			X								
SB-09-1					1110		X									
SB-09-3					1112		X									
SB-09-5					1115			X								
SB-09-10		Acetate			1122			X								
SB-09-15					1126			X								

Relinquished By:	Date/Time: 10.16.20 1340	Received By:	Date/Time: 10/16/20 1340	Turn-Around Time: Same day 72 hours
Relinquished By:	Date/Time: 10/19/20 0630	Received By:	Date/Time: 10.19.20 / 6:30	24 hour 5 days
				48 hour normal
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time:	Sample Integrity: (Check) intact ______ on ice ___

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

CHAIN OF CUSTODY FORM

Page 5 of 6

Client Name/Address: Stantec 735 E. Carnegie Drive, Suite 280 San Bernardino, CA 92408	Project/PO Number: 185804904 Direct Bill to Brandywine Homes
Project Manager: Joshua Sargent Email Address: Sampler: J. Sargent Joshua.Sargent@Stantec.com	Phone Number:909-335-6116 Fax Number:909-335-6120

Laboratory: Positive Labs 2010199

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD	STLC Lead 10/26/20 6010							10/26/20 1 See pg 1 of 6 Special Instructions
SB-05-1	Soil	8oz	1	10.16.20	1138	ICE	X									
SB-05-3		8oz			1140		X	X								
SB-05-5		8oz			1142			X								
SB-05-10		Acetate			1146			X								
SB-05-15		Acetate			1148			X								
SB-06-1		8oz			1155		X		/							
SB-06-3					1158		X	X								
SB-06-5					1200			X								
SB-06-10		Acetate			1205			X								
SB-06-15					1210			X								
HA-09-1		8oz			1215		X									

Relinquished By:	Date/Time: 10.16.20 1340	Received By:	Date/Time: 10.16.20 1340	Turn-Around Time: Same day 72 hours
Relinquished By:	Date/Time: 10.19.20 0630	Received By:	Date/Time:	24 hour 5 days
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time: 10.19.20 10:30	48 hour [✓ normal]
				Sample Integrity: (Check) intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

Stantec

CHAIN OF CUSTODY FORM

735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408
(909)335-6116, Fax (909) 335-6120

Page 6 of 6

2010199

Client Name/Address:
Stantec
735 E. Carnegie Drive, Suite 280
San Bernardino, CA 92408

Project/PO Number: 185804904

Laboratory: Positive Labs

Project Manager: Joshua Sargent
Email Address:

Sampler: J. Sargent Joshua.Sargent@Stantec.com

Phone Number:909-335-6116

Fax Number:909-335-6120

							Analysis Required										
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Lead 6010	HOLD	Lead 6010 10/26/20	TCLP Lead 6010 10/26/20	STLC Lead 6010 10/26/20						Special Instructions 10/26/20 / see pg 1 of 6
HA-08-1	Soil	8oz	1	10.16.20	1226	ICE	X				/						
HA-08-3					1228		X	~~X~~									
HA-08-5					1230			X									
HA-05-1					1240		X			/							
HA-05-3					1242			~~X~~	/								
HA-05-5					1245			~~X~~	/								

Relinquished By: Date/Time: 10.16.20 1340 Received By: Date/Time: 10-16-20 1340

Relinquished By: Date/Time: 10/19/20 0830 Received By: Date/Time: 10.19.20 16:30

Relinquished By: Date/Time: Received in Lab By: Date/Time:

Turn-Around Time: Same day 72 hours
24 hour 5 days
48 hour [✓ normal]

Sample Integrity: (Check)
intact ________ on ice ____

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

JONES
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714-449-9937
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SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Stantec
Client Address: 735 E Carnegie Dr. #280
San Bernadino, CA

Attn: Josh Sargent

Project: Brandywine - Long Beach
Project Address: 5801 Atlantic Ave
Long Beach, CA 90805

Report Date: 10/22/2020
Jones Ref. No.: ST-16280
Client Ref. No.: 185104904

Date Sampled: 10/19/2020
Date Received: 10/19/2020
Date Analyzed: 10/20/2020
Physical State: Soil Gas

ANALYSES REQUESTED

1. EPA TO-15 – Volatile Organics by GC/MS

Analytical – Soil Gas samples were analyzed using EPA Method TO-15. Instrument Continuing Calibration Verification (CCV) and Instrument Blanks were analyzed every 24 hours as prescribed by the method. In addition, a Continuing Calibration Verification Duplicate (CCVD) was analyzed with each batch of Soil Gas samples.

Approval:

Colby Wakeman
QA/QC Manager

JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Stantec
Client Address: 735 E Carnegie Dr. #280
San Bernadino, CA

Attn: Josh Sargent

Project: Brandywine - Long Beach
Project Address: 5801 Atlantic Ave
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Report Date: 10/22/2020
Jones Ref. No.: ST-16280
Client Ref. No.: 185104904

Date Sampled: 10/19/2020
Date Received: 10/19/2020
Date Analyzed: 10/20/2020
Physical State: Soil Gas

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-09-5'**	**SB-09-15'**	**SB-06-5'**	**SB-06-15'**	**SB-05-5'**		
Jones ID:	**ST-16280-01**	**ST-16280-02**	**ST-16280-03**	**ST-16280-04**	**ST-16280-05**	**Reporting Limit**	**Units**
Analytes:							
Acetone	**12.3**	**23.2**	**45.3**	**12.4**	**17.0**	3.0	μg/m3
Acrolein	ND	ND	ND	ND	ND	1.0	μg/m3
Benzene	ND	ND	ND	ND	ND	1.0	μg/m3
Bromodichloromethane	ND	ND	ND	ND	ND	1.0	μg/m3
Bromoform	ND	ND	ND	ND	ND	1.0	μg/m3
1,3-Butadiene	ND	ND	ND	ND	ND	1.0	μg/m3
2-Butanone (MEK)	**6.4**	**10.0**	**11.5**	**8.7**	**6.3**	1.0	μg/m3
n-Butylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
sec-Butylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
tert-Butylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Carbon tetrachloride	ND	ND	ND	ND	ND	1.0	μg/m3
Chlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Chloroform	ND	ND	ND	ND	ND	1.0	μg/m3
Carbon Disulfide	ND	**2.1**	ND	ND	ND	1.0	μg/m3
Cyclohexane	ND	ND	ND	ND	ND	1.0	μg/m3
Dibromochloromethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	1.0	μg/m3
1,4-Dioxane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,1-Dichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2-Dichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-09-5'**	**SB-09-15'**	**SB-06-5'**	**SB-06-15'**	**SB-05-5'**		
Jones ID:	**ST-16280-01**	**ST-16280-02**	**ST-16280-03**	**ST-16280-04**	**ST-16280-05**	**Reporting Limit**	**Units**
Analytes:							
Ethyl Acetate	ND	ND	ND	ND	ND	1.0	μg/m3
Ethylbenzene	ND	**18.7**	ND	ND	ND	1.0	μg/m3
4-Ethyltoluene	ND	**1.6**	ND	ND	ND	1.0	μg/m3
Freon 11	**1.1**	ND	**1.0**	**1.0**	**1.1**	1.0	μg/m3
Freon 12	**2.3**	**2.3**	**2.3**	**2.2**	**2.6**	1.0	μg/m3
Freon 113	ND	ND	ND	ND	ND	1.0	μg/m3
Freon 114	ND	ND	ND	ND	ND	1.0	μg/m3
2-Hexanone (MBK)	ND	**2.6**	**2.8**	ND	ND	1.0	μg/m3
Isopropanol	ND	ND	**11.3**	**7.3**	**5.4**	2.5	μg/m3
Isopropylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
4-Isopropyltoluene	ND	**3.8**	ND	**1.7**	ND	1.0	μg/m3
4-Methyl-2-pentanone (MIBK)	ND	**2.7**	**2.3**	**1.0**	ND	1.0	μg/m3
Methylene chloride	ND	ND	**1.4**	ND	**1.2**	1.0	μg/m3
Methylmethacrylate	ND	ND	ND	ND	ND	1.0	μg/m3
Naphthalene	ND	**2.5**	ND	ND	ND	2.0	μg/m3
n-Propylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Propylene	ND	ND	**1.0**	ND	ND	1.0	μg/m3
Styrene	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
Tetrachloroethene	**14.1**	**20.0**	**26.1**	**20.8**	**90.5**	1.0	μg/m3
Toluene	**3.0**	**8.3**	**2.9**	**4.0**	**3.3**	1.0	μg/m3
Tetrahydrofuran	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
Trichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
1,2,4-Trimethylbenzene	ND	**2.3**	**2.6**	**1.0**	ND	1.0	μg/m3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Vinyl Chloride	ND	ND	ND	ND	ND	1.0	μg/m3
Vinyl Acetate	ND	ND	ND	ND	ND	1.0	μg/m3
m+p-Xylene	ND	**99.6**	ND	ND	ND	1.0	μg/m3
o-Xylene	ND	**33.1**	ND	ND	ND	1.0	μg/m3
MTBE	ND	ND	ND	ND	ND	1.0	μg/m3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	1.0	μg/m3
Di-isopropylether	ND	ND	ND	ND	ND	1.0	μg/m3
tert-amylmethylether	ND	ND	ND	ND	ND	1.0	μg/m3
Tracer:							
n-Pentane	ND	ND	ND	ND	ND	10.0	μg/m3
n-Hexane	ND	ND	ND	ND	ND	10.0	μg/m3
n-Heptane	ND	ND	ND	ND	ND	10.0	μg/m3
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
4-Bromofluorobenzene	99%	100%	95%	100%	99%	60 - 140	
Batch ID:	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01		

ND = Value below reporting limit

JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Stantec
Client Address: 735 E Carnegie Dr. #280
San Bernadino, CA

Attn: Josh Sargent

Project: Brandywine - Long Beach
Project Address: 5801 Atlantic Ave
Long Beach, CA 90805

Report Date: 10/22/2020
Jones Ref. No.: ST-16280
Client Ref. No.: 185104904

Date Sampled: 10/19/2020
Date Received: 10/19/2020
Date Analyzed: 10/20/2020
Physical State: Soil Gas

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-05-15'**	**SB-08-5'**	**SB-08-15'**	**SB-07-5'**	**SB-07-15'**		
Jones ID:	**ST-16280-06**	**ST-16280-07**	**ST-16280-08**	**ST-16280-09**	**ST-16280-10**	**Reporting Limit**	**Units**
Analytes:							
Acetone	**12.3**	**12.5**	**16.5**	**13.3**	**17.2**	3.0	µg/m3
Acrolein	ND	ND	ND	ND	ND	1.0	µg/m3
Benzene	**1.0**	ND	ND	ND	ND	1.0	µg/m3
Bromodichloromethane	ND	ND	ND	ND	ND	1.0	µg/m3
Bromoform	ND	ND	ND	ND	ND	1.0	µg/m3
1,3-Butadiene	ND	ND	ND	ND	ND	1.0	µg/m3
2-Butanone (MEK)	**5.5**	**6.1**	**7.6**	**7.0**	**7.7**	1.0	µg/m3
n-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
sec-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
tert-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
Carbon tetrachloride	ND	ND	ND	ND	ND	1.0	µg/m3
Chlorobenzene	ND	ND	ND	ND	ND	1.0	µg/m3
Chloroform	**30.6**	**1.2**	ND	ND	ND	1.0	µg/m3
Carbon Disulfide	**4.7**	**1.2**	**2.1**	ND	**1.4**	1.0	µg/m3
Cyclohexane	ND	ND	**1.0**	ND	ND	1.0	µg/m3
Dibromochloromethane	ND	ND	ND	ND	ND	1.0	µg/m3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	1.0	µg/m3
1,4-Dioxane	ND	ND	ND	ND	ND	1.0	µg/m3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/m3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/m3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/m3
1,1-Dichloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
1,2-Dichloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
1,1-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/m3
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/m3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/m3

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-05-15'**	**SB-08-5'**	**SB-08-15'**	**SB-07-5'**	**SB-07-15'**		
Jones ID:	**ST-16280-06**	**ST-16280-07**	**ST-16280-08**	**ST-16280-09**	**ST-16280-10**	**Reporting Limit**	**Units**
Analytes:							
Ethyl Acetate	ND	ND	**1.9**	ND	ND	1.0	µg/m3
Ethylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
4-Ethyltoluene	ND	ND	ND	ND	ND	1.0	µg/m3
Freon 11	**1.1**	ND	ND	**1.0**	ND	1.0	µg/m3
Freon 12	**2.6**	**2.3**	**2.5**	**2.0**	**2.2**	1.0	µg/m3
Freon 113	ND	ND	ND	ND	ND	1.0	µg/m3
Freon 114	ND	ND	ND	ND	ND	1.0	µg/m3
2-Hexanone (MBK)	ND	ND	ND	ND	ND	1.0	µg/m3
Isopropanol	ND	ND	ND	ND	ND	2.5	µg/m3
Isopropylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
4-Isopropyltoluene	ND	ND	ND	**1.6**	**1.4**	1.0	µg/m3
4-Methyl-2-pentanone (MIBK)	ND	ND	**1.9**	**1.0**	**1.6**	1.0	µg/m3
Methylene chloride	ND	ND	ND	ND	ND	1.0	µg/m3
Methylmethacrylate	ND	ND	ND	ND	ND	1.0	µg/m3
Naphthalene	ND	ND	ND	ND	ND	2.0	µg/m3
n-Propylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
Styrene	ND	ND	ND	ND	ND	1.0	µg/m3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
Tetrachloroethene	**64.9**	**3.4**	**7.0**	**2.4**	**3.3**	1.0	µg/m3
Toluene	**11.8**	**2.8**	**3.6**	**3.2**	**5.2**	1.0	µg/m3
Tetrahydrofuran	ND	ND	ND	ND	ND	1.0	µg/m3
Propylene	ND	ND	ND	ND	ND	1.0	µg/m3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	1.0	µg/m3
Trichloroethene	ND	ND	ND	ND	ND	1.0	µg/m3
1,2,4-Trimethylbenzene	**1.4**	ND	ND	**1.0**	ND	1.0	µg/m3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	1.0	µg/m3
Vinyl Chloride	ND	ND	ND	ND	ND	1.0	µg/m3
Vinyl Acetate	ND	ND	ND	ND	ND	1.0	µg/m3
m+p-Xylene	**2.0**	ND	ND	ND	**1.0**	1.0	µg/m3
o-Xylene	ND	ND	ND	ND	ND	1.0	µg/m3
MTBE	ND	ND	ND	ND	ND	1.0	µg/m3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	1.0	µg/m3
Di-isopropylether	ND	ND	ND	ND	ND	1.0	µg/m3
tert-amylmethylether	ND	ND	ND	ND	ND	1.0	µg/m3
Tracer:							
n-Pentane	ND	ND	ND	ND	ND	10.0	µg/m3
n-Hexane	ND	ND	ND	ND	ND	10.0	µg/m3
n-Heptane	ND	ND	ND	ND	ND	10.0	µg/m3
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
4-Bromofluorobenzene	99%	102%	97%	98%	97%	60 - 140	
Batch ID:	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01		

ND = Value below reporting limit

JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Stantec	**Report Date:**	10/22/2020
Client Address:	735 E Carnegie Dr. #280	**Jones Ref. No.:**	ST-16280
	San Bernadino, CA	**Client Ref. No.:**	185104904
Attn:	Josh Sargent	**Date Sampled:**	10/19/2020
		Date Received:	10/19/2020
Project:	Brandywine - Long Beach	**Date Analyzed:**	10/20/2020
Project Address:	5801 Atlantic Ave	**Physical State:**	Soil Gas
	Long Beach, CA 90805		

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-04-5'**	**SB-04-15'**	**SB-03-5'**	**SB-03-15'**	**SB-02-5'**		
Jones ID:	**ST-16280-11**	**ST-16280-12**	**ST-16280-13**	**ST-16280-14**	**ST-16280-15**	**Reporting Limit**	**Units**
Analytes:							
Acetone	**8.1**	**10.0**	**17.6**	**26.9**	**11.7**	3.0	μg/m3
Acrolein	ND	ND	ND	ND	ND	1.0	μg/m3
Benzene	ND	ND	**11.0**	ND	ND	1.0	μg/m3
Bromodichloromethane	ND	ND	ND	ND	ND	1.0	μg/m3
Bromoform	ND	ND	ND	ND	ND	1.0	μg/m3
1,3-Butadiene	ND	ND	ND	ND	ND	1.0	μg/m3
2-Butanone (MEK)	**4.0**	**3.5**	**9.0**	**6.7**	**3.0**	1.0	μg/m3
n-Butylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
sec-Butylbenzene	ND	ND	**1.9**	ND	ND	1.0	μg/m3
tert-Butylbenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Carbon tetrachloride	ND	ND	ND	ND	ND	1.0	μg/m3
Chlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
Chloroform	**13.9**	ND	ND	ND	ND	1.0	μg/m3
Carbon Disulfide	ND	**3.5**	**4.8**	**6.6**	ND	1.0	μg/m3
Cyclohexane	ND	ND	**3.6**	ND	ND	1.0	μg/m3
Dibromochloromethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	1.0	μg/m3
1,4-Dioxane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	μg/m3
1,1-Dichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,2-Dichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-04-5'**	**SB-04-15'**	**SB-03-5'**	**SB-03-15'**	**SB-02-5'**		
Jones ID:	**ST-16280-11**	**ST-16280-12**	**ST-16280-13**	**ST-16280-14**	**ST-16280-15**	**Reporting Limit**	**Units**
Analytes:							
Ethyl Acetate	ND	ND	ND	ND	ND	1.0	μg/m3
Ethylbenzene	ND	ND	**3.9**	ND	ND	1.0	μg/m3
4-Ethyltoluene	ND	ND	**7.5**	ND	ND	1.0	μg/m3
Freon 11	ND	**1.1**	**10.0**	**9.5**	**1.1**	1.0	μg/m3
Freon 12	**2.2**	**2.5**	**2.1**	**2.6**	**2.6**	1.0	μg/m3
Freon 113	ND	ND	ND	ND	ND	1.0	μg/m3
Freon 114	ND	ND	ND	ND	ND	1.0	μg/m3
2-Hexanone (MBK)	ND	ND	**5.4**	ND	ND	1.0	μg/m3
Isopropanol	ND	ND	ND	ND	ND	2.5	μg/m3
Isopropylbenzene	ND	ND	**1.6**	ND	ND	1.0	μg/m3
4-Isopropyltoluene	ND	ND	ND	ND	ND	1.0	μg/m3
4-Methyl-2-pentanone (MIBK)	ND	ND	**3.2**	ND	ND	1.0	μg/m3
Methylene chloride	ND	**1.2**	**1.6**	ND	ND	1.0	μg/m3
Methylmethacrylate	ND	ND	ND	ND	ND	1.0	μg/m3
Naphthalene	ND	ND	**6.0**	ND	ND	2.0	μg/m3
n-Propylbenzene	ND	ND	**5.2**	ND	ND	1.0	μg/m3
Styrene	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
Tetrachloroethene	ND	**3.7**	**3.6**	**3.4**	**2.4**	1.0	μg/m3
Toluene	**3.8**	**3.5**	**5.7**	**5.3**	**3.4**	1.0	μg/m3
Tetrahydrofuran	ND	ND	ND	ND	ND	1.0	μg/m3
Propylene	ND	ND	ND	**3.0**	ND	1.0	μg/m3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	1.0	μg/m3
Trichloroethene	ND	ND	ND	ND	ND	1.0	μg/m3
1,2,4-Trimethylbenzene	ND	ND	**15.5**	**1.3**	ND	1.0	μg/m3
1,3,5-Trimethylbenzene	ND	ND	**3.1**	ND	ND	1.0	μg/m3
Vinyl Chloride	ND	ND	ND	ND	ND	1.0	μg/m3
Vinyl Acetate	ND	ND	ND	ND	ND	1.0	μg/m3
m+p-Xylene	ND	ND	**14.1**	ND	ND	1.0	μg/m3
o-Xylene	ND	ND	**2.0**	ND	ND	1.0	μg/m3
MTBE	ND	ND	ND	ND	ND	1.0	μg/m3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	1.0	μg/m3
Di-isopropylether	ND	ND	ND	ND	ND	1.0	μg/m3
tert-amylmethylether	ND	ND	ND	ND	ND	1.0	μg/m3
Tracer:							
n-Pentane	ND	ND	ND	ND	ND	10.0	μg/m3
n-Hexane	ND	ND	ND	ND	ND	10.0	μg/m3
n-Heptane	ND	ND	ND	ND	ND	10.0	μg/m3
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
4-Bromofluorobenzene	97%	100%	99%	96%	96%	60 - 140	
Batch ID:	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01	TO2-102020-01		

ND = Value below reporting limit

JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Stantec	**Report Date:**	10/22/2020
Client Address:	735 E Carnegie Dr. #280 San Bernadino, CA	**Jones Ref. No.:**	ST-16280
		Client Ref. No.:	185104904
Attn:	Josh Sargent	**Date Sampled:**	10/19/2020
		Date Received:	10/19/2020
Project:	Brandywine - Long Beach	**Date Analyzed:**	10/20/2020
Project Address:	5801 Atlantic Ave Long Beach, CA 90805	**Physical State:**	Soil Gas

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-02-15'**	**SB-01-5'**	**SB-01-15'**		
Jones ID:	**ST-16280-16**	**ST-16280-17**	**ST-16280-18**	**Reporting Limit**	**Units**
Analytes:					
Acetone	**11.8**	ND	**14.3**	3.0	µg/m3
Acrolein	ND	ND	ND	1.0	µg/m3
Benzene	ND	ND	ND	1.0	µg/m3
Bromodichloromethane	ND	ND	ND	1.0	µg/m3
Bromoform	ND	ND	ND	1.0	µg/m3
1,3-Butadiene	ND	ND	ND	1.0	µg/m3
2-Butanone (MEK)	**3.3**	ND	**3.1**	1.0	µg/m3
n-Butylbenzene	ND	ND	ND	1.0	µg/m3
sec-Butylbenzene	ND	ND	ND	1.0	µg/m3
tert-Butylbenzene	ND	ND	ND	1.0	µg/m3
Carbon tetrachloride	ND	ND	ND	1.0	µg/m3
Chlorobenzene	ND	ND	ND	1.0	µg/m3
Chloroform	ND	ND	ND	1.0	µg/m3
Carbon Disulfide	**1.4**	ND	**3.0**	1.0	µg/m3
Cyclohexane	ND	ND	**1.5**	1.0	µg/m3
Dibromochloromethane	ND	ND	ND	1.0	µg/m3
1,2-Dibromoethane (EDB)	ND	ND	ND	1.0	µg/m3
1,4-Dioxane	ND	ND	ND	1.0	µg/m3
1,2- Dichlorobenzene	ND	ND	ND	1.0	µg/m3
1,3-Dichlorobenzene	ND	ND	ND	1.0	µg/m3
1,4-Dichlorobenzene	ND	ND	ND	1.0	µg/m3
1,1-Dichloroethane	ND	ND	ND	1.0	µg/m3
1,2-Dichloroethane	ND	ND	ND	1.0	µg/m3
1,1-Dichloroethene	ND	ND	ND	1.0	µg/m3
cis-1,2-Dichloroethene	ND	ND	ND	1.0	µg/m3
trans-1,2-Dichloroethene	ND	ND	ND	1.0	µg/m3

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**SB-02-15'**	**SB-01-5'**	**SB-01-15'**		
Jones ID:	**ST-16280-16**	**ST-16280-17**	**ST-16280-18**	**Reporting Limit**	**Units**
Analytes:					
Ethyl Acetate	ND	ND	ND	1.0	µg/m3
Ethylbenzene	ND	ND	ND	1.0	µg/m3
4-Ethyltoluene	ND	ND	ND	1.0	µg/m3
Freon 11	ND	ND	ND	1.0	µg/m3
Freon 12	**2.3**	ND	**2.3**	1.0	µg/m3
Freon 113	ND	ND	ND	1.0	µg/m3
Freon 114	ND	ND	ND	1.0	µg/m3
2-Hexanone (MBK)	ND	ND	ND	1.0	µg/m3
Isopropanol	ND	ND	ND	2.5	µg/m3
Isopropylbenzene	ND	ND	ND	1.0	µg/m3
4-Isopropyltoluene	ND	ND	ND	1.0	µg/m3
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	1.0	µg/m3
Methylene chloride	ND	ND	**1.0**	1.0	µg/m3
Methylmethacrylate	ND	ND	ND	1.0	µg/m3
Naphthalene	ND	ND	ND	2.0	µg/m3
n-Propylbenzene	ND	ND	ND	1.0	µg/m3
Styrene	ND	ND	ND	1.0	µg/m3
1,1,1,2-Tetrachloroethane	ND	ND	ND	1.0	µg/m3
1,1,2,2-Tetrachloroethane	ND	ND	ND	1.0	µg/m3
Tetrachloroethene	**5.6**	ND	**7.0**	1.0	µg/m3
Toluene	**3.3**	ND	**3.3**	1.0	µg/m3
Tetrahydrofuran	ND	ND	ND	1.0	µg/m3
Propylene	ND	ND	ND	1.0	µg/m3
1,1,1-Trichloroethane	ND	ND	ND	1.0	µg/m3
1,1,2-Trichloroethane	ND	ND	ND	1.0	µg/m3
Trichloroethene	ND	ND	ND	1.0	µg/m3
1,2,4-Trimethylbenzene	**1.5**	ND	ND	1.0	µg/m3
1,3,5-Trimethylbenzene	ND	ND	ND	1.0	µg/m3
Vinyl Chloride	ND	ND	ND	1.0	µg/m3
Vinyl Acetate	ND	ND	ND	1.0	µg/m3
m+p-Xylene	ND	ND	ND	1.0	µg/m3
o-Xylene	ND	ND	ND	1.0	µg/m3
MTBE	ND	ND	ND	1.0	µg/m3
Ethyl-tert-butylether	ND	ND	ND	1.0	µg/m3
Di-isopropylether	ND	ND	ND	1.0	µg/m3
tert-amylmethylether	ND	ND	ND	1.0	µg/m3
Tracer:					
n-Pentane	ND	ND	ND	10.0	µg/m3
n-Hexane	ND	ND	ND	10.0	µg/m3
n-Heptane	ND	ND	ND	10.0	µg/m3
Dilution Factor	1	1	1		
Surrogate Recoveries:				**QC Limits**	
4-Bromofluorobenzene	97%	95%	99%	60 - 140	
Batch ID:	TO2-102020-01	TO2-102020-01	TO2-102020-01		

ND = Value below reporting limit

JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Stantec	**Report Date:**	10/22/2020
Client Address:	735 E Carnegie Dr. #280	**Jones Ref. No.:**	ST-16280
	San Bernadino, CA	**Client Ref. No.:**	185104904
Attn:	Josh Sargent	**Date Sampled:**	10/19/2020
		Date Received:	10/19/2020
Project:	Brandywine - Long Beach	**Date Analyzed:**	10/20/2020
Project Address:	5801 Atlantic Ave	**Physical State:**	Soil Gas
	Long Beach, CA 90805		

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**METHOD BLANK**		
Jones ID:	**102020-TO2MB1**	**Reporting Limit**	**Units**
Analytes:			
Acetone	ND	3.0	µg/m3
Acrolein	ND	1.0	µg/m3
Benzene	ND	1.0	µg/m3
Bromodichloromethane	ND	1.0	µg/m3
Bromoform	ND	1.0	µg/m3
1,3-Butadiene	ND	1.0	µg/m3
2-Butanone (MEK)	ND	1.0	µg/m3
n-Butylbenzene	ND	1.0	µg/m3
sec-Butylbenzene	ND	1.0	µg/m3
tert-Butylbenzene	ND	1.0	µg/m3
Carbon tetrachloride	ND	1.0	µg/m3
Chlorobenzene	ND	1.0	µg/m3
Chloroform	ND	1.0	µg/m3
Carbon Disulfide	ND	1.0	µg/m3
Cyclohexane	ND	1.0	µg/m3
Dibromochloromethane	ND	1.0	µg/m3
1,2-Dibromoethane (EDB)	ND	1.0	µg/m3
1,4-Dioxane	ND	1.0	µg/m3
1,2- Dichlorobenzene	ND	1.0	µg/m3
1,3-Dichlorobenzene	ND	1.0	µg/m3
1,4-Dichlorobenzene	ND	1.0	µg/m3
1,1-Dichloroethane	ND	1.0	µg/m3
1,2-Dichloroethane	ND	1.0	µg/m3
1,1-Dichloroethene	ND	1.0	µg/m3
cis-1,2-Dichloroethene	ND	1.0	µg/m3
trans-1,2-Dichloroethene	ND	1.0	µg/m3

JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

EPA TO-15 – Volatile Organics by GC/MS

Sample ID:	**METHOD BLANK**		
Jones ID:	**102020-TO2MB1**	**Reporting Limit**	**Units**
Analytes:			
Ethyl Acetate	ND	1.0	µg/m3
Ethylbenzene	ND	1.0	µg/m3
Ethylbenzene	ND	1.0	µg/m3
Freon 11	ND	1.0	µg/m3
Freon 12	ND	1.0	µg/m3
Freon 113	ND	1.0	µg/m3
Freon 114	ND	1.0	µg/m3
2-Hexanone (MBK)	ND	1.0	µg/m3
Isopropanol	ND	2.5	µg/m3
Isopropylbenzene	ND	1.0	µg/m3
4-Isopropyltoluene	ND	1.0	µg/m3
4-Methyl-2-pentanone (MIBK)	ND	1.0	µg/m3
Methylene chloride	ND	1.0	µg/m3
Methylmethacrylate	ND	1.0	µg/m3
Naphthalene	ND	2.0	µg/m3
n-Propylbenzene	ND	1.0	µg/m3
Styrene	ND	1.0	µg/m3
1,1,1,2-Tetrachloroethane	ND	1.0	µg/m3
1,1,2,2-Tetrachloroethane	ND	1.0	µg/m3
Tetrachloroethene	ND	1.0	µg/m3
Toluene	ND	1.0	µg/m3
Tetrahydrofuran	ND	1.0	µg/m3
Propylene	ND	1.0	µg/m3
1,1,1-Trichloroethane	ND	1.0	µg/m3
1,1,2-Trichloroethane	ND	1.0	µg/m3
Trichloroethene	ND	1.0	µg/m3
1,2,4-Trimethylbenzene	ND	1.0	µg/m3
1,3,5-Trimethylbenzene	ND	1.0	µg/m3
Vinyl Chloride	ND	1.0	µg/m3
Vinyl Acetate	ND	1.0	µg/m3
m+p-Xylene	ND	1.0	µg/m3
o-Xylene	ND	1.0	µg/m3
MTBE	ND	1.0	µg/m3
Ethyl-tert-butylether	ND	1.0	µg/m3
Di-isopropylether	ND	1.0	µg/m3
tert-amylmethylether	ND	1.0	µg/m3
Tracer:			
n-Pentane	ND	10.0	µg/m3
n-Hexane	ND	10.0	µg/m3
n-Heptane	ND	10.0	µg/m3
Dilution Factor	1		
Surrogate Recoveries:		**QC Limits**	
4-Bromofluorobenzene	99%	60 - 140	
Batch ID:	TO2-102020-01		

ND = Value below reporting limit

JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Stantec	**Report date:**	10/22/2020
Client Address:	735 E Carnegie Dr. #280	**Jones Ref. No.:**	ST-16280
	San Bernadino, CA	**Client Ref. No.:**	185104904
Attn:	Josh Sargent	**Date Sampled:**	10/19/2020
		Date Received:	10/19/2020
Project:	Brandywine - Long Beach	**Date Analyzed:**	10/20/2020
Project Address:	5801 Atlantic Ave	**Physical State:**	Soil Gas
	Long Beach, CA 90805		

EPA TO-15 – Volatile Organics by GC/MS

Batch ID: TO2-102020-01

Jones ID: **102020-TO2CCV1** **102020-TO2CCVD1**

Parameter	CCV Recovery (%)	CCVD Recovery (%)	RPD	Acceptability Range (%)
Vinyl chloride	112%	114%	1.8%	70 - 130
1,1-Dichloroethene	98%	96%	2.1%	70 - 130
Cis-1,2-Dichloroethene	94%	94%	0.0%	70 - 130
1,1,1-Trichloroethane	92%	84%	9.1%	70 - 130
Benzene	92%	96%	4.3%	70 - 130
Trichloroethene	94%	90%	4.3%	70 - 130
Toluene	88%	86%	2.3%	70 - 130
Tetrachloroethene	98%	98%	0.0%	70 - 130
Chlorobenzene	98%	102%	4.0%	70 - 130
Ethylbenzene	100%	94%	6.2%	70 - 130
1,2,4 Trimethylbenzene	98%	88%	10.8%	70 - 130
Surrogate Recovery:				
4-Bromofluorobenzene	100%	101%		60 - 140

CCV = Continuing Calibration Verification
CCV = Continuing Calibration Verification Duplciate
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

JONES
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11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

Air Chain-of-Custody Record

Client: Stantec

Project Name: ~~185104904~~ Brandywine - Long Beach

Project Address: 5801 Atlantic Ave
Long Beach, CA 90805

Email:

Phone:

Report To: Josh Sargent

Sampler: Daniel Zambrano

Date: 10/19/2020

Client Project #: 185104904

Purge Rate: 200 cc/min

Shut In Test: [✓ Y] / N

Jones Project # ST-160280

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Turn Around Requested:
☐ Immediate Attention
Rush:
☐ 24hr ☐ 48hr
☐ 72hr ☐ 96hr
☑ Normal

Tracer:
☐ n-pentane
☐ Helium
☑ 1:1-Heps
Hept : Pent

Purge Number:
☐ 1 PV
☑ 3 PV
☐ 7 PV
☐ 10 PV

Analysis Requested

Sample ID	Date Collected	Purge Number	Purge Volume	Laboratory Sample ID	Canister ID	Canister Start Vacuum	Canister End Vacuum	Flow Rate (cc/min)	Sampling Start Time	Sampling End Time	TO-15	8260B	Magnehelic Reading (in/H$_2$O)	Number of Containers
SB-09-5'	10/19	3	1630	ST-160280-01	B2451	-30	-5	200	0714	0721	X			
SB-09-15'	10/19	3	1790	ST-160280-02	B2445	-30	-4	200	0713	0719	X			
SB-06-5'	10/19	3	1630	ST-160280-03	01220	-30	-5	200	0728	0736	X			
SB-06-15'	10/19	3	1790	ST-160280-04	B2425	-30	-4	200	0728	0735	X			
SB-05-5'	10/19	3	1630	ST-160280-05	B2438	-30	-5	200	0746	0754	X			
SB-05-15'	10/19	3	1790	ST-160280-06	B2447	-30	-5	200	0746	0751	X			
SB-08-5'	10/19	3	1630	ST-160280-07	B2456	-30	-3	200	0802	0809	X			
SB-08-15'	10/19	3	1790	ST-160280-08	B2416	-30	-6	200	0802	0814	X			
SB-07-5'	10/19	3	1630	ST-160280-09	B2423	-30	-4	200	0816	0823	X			
SB-07-15'	10/19	3	1790	ST-160280-10	1515	-30	-4	200	0816	0823	X			

Relinquished By (Signature):
Date: 10/19/2020
Company: Stantec
Time: 0951

Recieved By (Signature):
Date: 10/19/2020
Company: Jones Env.
Time: 0951

Relinquished By (Signature):
Date:
Company:
Time:

Recieved By Laboratory (Signature):
Date:
Company:
Time:

The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specificied above under the Terms and Conditions set forth

JONES
ENVIRONMENTAL, INC.

11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

Air Chain-of-Custody Record

Client

Project Name

Project Address See Page 1

Email

Phone

Report To

Sampler

Date 10/19/2020

Client Project #

Purge Rate: 200 cc/min

Shut In Test: [✓ Y] / N

Jones Project # ST-16280

Page

Turn Around Requested:

☐ Immediate Attention

Rush:

☐ 24hr ☐ 48hr

☐ 72hr ☐ 96hr

☐ Normal

Tracer:

☐ n-pentane

☐ Helium

☑ 1;1;1-h:h:p

Purge Number:

☐ 1 PV

☑ 3 PV

☐ 7 PV

☐ 10 PV

Analysis Requested

Sample ID	Date Collected	Purge Number	Purge Volume	Laboratory Sample ID	Canister ID	Canister Start Vacuum	Canister End Vacuum	Flow Rate (cc/min)	Sampling Start Time	Sampling End Time	TO-15	8260B	Magnehelic Reading (in/H$_2$O)	Number of Containers
SB-04-5'	10/19	3	1630	ST-16280-11	1580	<-30	-16	200	0846	0901	X			
SB-04-15'	10/19	3	1790	ST-16280-12	B2459	-30	-4	200	0846	0852	X			
SB-03-5'	10/19	3	1630	ST-16280-13	B2454	-30	-5	200	0906	0914	X			
SB-03-15'	10/19	3	1790	ST-16280-14	01219	-30	-4	200	0906	0912	X			
SB-02-5'	10/19	3	1630	ST-16280-15	B2460	-30	-4	200	0924	0932	X			
SB-02-15'	10/19	3	1790	ST-16280-16	B2413	-30	-4	200	0924	0932	X			
SB-01-5'	10/19	3	1630	ST-16280-17	1509	-30	-4	200	0935	0944	X			
SB-01-15'	10/19	3	1790	ST-16280-18	1513B	-30	-3	200	0935	0944	X			

Relinquished By (Signature):
Date: 10/19/2020
Company stantec
Time: 0951

Recieved By (Signature):
Date: 10/19/2020
Company JEL
Time:

Relinquished By (Signature):
Date:
Company
Time:

Recieved By Laboratory (Signature):
Date:
Company
Time:

The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specificied above under the Terms and Conditions set forth

LINSCOTT
LAW &
GREENSPAN
engineers

REVISED TRAFFIC STUDY

ATLANTIC 84-TOWNHOMES RESIDENTIAL PROJECT

Long Beach, California
June 10, 2021
(Original dated April 20, 2021)

Prepared for:

BRANDYWINE HOMES, INC
16580 ASTON
Irvine, CA 92606

REGISTERED PROFESSIONAL ENGINEER
SHANE S. GREEN
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Exp. 3/31/22
CIVIL
STATE OF CALIFORNIA

LLG Ref. 2-21-4386-1

REGISTERED PROFESSIONAL ENGINEER
RICHARD E. BARRETTO
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EXECUTIVE SUMMARY

Project Description

- The existing site is located along the eastside of Atlantic Avenue, between 59th Street and South Street, and is currently vacant. The proposed Project includes the construction of an 84-unit multifamily residential development with 2,000 SF of restaurant/café uses. Parking for the proposed Project will be provided via 39 on-street parking spaces along with 229 spaces located on-site. The on-site spaces include 168 attached garage spaces and 22 surface parking stalls.

- Vehicular access to the Project site will be provided via an unsignalized full access driveway located midblock along Linden Avenue.

- The proposed Project is forecast to generate approximately 579 daily trips, with 44 trips (16 inbound, 28 outbound) produced in the AM peak hour and 48 trips (30 inbound, 18 outbound) produced in the PM peak hour on a “typical” weekday.

Study Area

- The six (6) key study intersections have been identified for evaluation in collaboration with City of Long Beach staff. The key study intersections listed below provide both local and regional access to the study area and define the extent of the boundaries for this traffic impact investigations.

Key Study Intersections

1. Atlantic Avenue at 59th Street
2. Atlantic Avenue at South Street
3. Linden Avenue at 59th Street (north)
4. Linden Avenue at 59th Street (south)
5. Linden Avenue at Hullet Street
6. Linden Avenue at South Street

Related Projects Description

- Thirteen (13) cumulative projects are expected to generate a combined total of 10,028 daily trips, 969 AM peak hour trips (700 inbound and 269 outbound) and 1,109 PM peak hour trips (422 inbound and 687 outbound) on a typical weekday.

Traffic Impact Analysis

Existing Traffic Conditions

- All of the key study intersections currently operate at LOS C or better during the weekday AM and PM peak hours.

Existing Traffic with "Complete Streets" Improvements Conditions

- All of the key study intersections are forecast to operate at LOS C or better during the weekday AM and PM peak hours.

Existing Plus Project Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project traffic conditions.

Existing Plus Project with "Complete Streets" Improvements Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project with "Complete Streets" Improvements traffic conditions.

Year 2024 Cumulative Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative traffic conditions.

Year 2024 Cumulative with "Complete Streets" Improvements Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative with "Complete Streets" Improvements traffic conditions.

Year 2024 Cumulative Plus Project Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative Plus Project traffic conditions.

Year 2024 Cumulative Plus with "Complete Streets" Improvements Project Traffic Conditions

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative Plus Project with "Complete Streets" Improvements traffic conditions.

Intersection Vehicle Queuing Analysis

Existing Traffic Conditions

- One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Existing traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:
    - Intersection No. 2: Atlantic Avenue at South Street
        - Westbound left-turn – AM and PM peak hours

Existing Plus Project Traffic Conditions

- One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach with the addition of project traffic. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:
    - Intersection No. 2: Atlantic Avenue at South Street
        - Westbound left-turn – AM and PM peak hours

- The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Existing with "Complete Streets" Improvements Traffic Conditions

- One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Existing with "Complete Streets" Improvements traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:
    - Intersection No. 2: Atlantic Avenue at South Street
        - Westbound left-turn – AM and PM peak hours

Existing Plus Project with "Complete Streets" Improvements Traffic Conditions

- One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach with the addition of project traffic. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

➢ The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Year 2024 Cumulative Traffic Conditions

➢ One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Year 2024 Cumulative traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

Year 2024 Cumulative Plus Project Traffic Conditions

➢ One (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach with the addition of project traffic, with the inclusion of the "complete streets" improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hour

➢ The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Year 2024 Cumulative with "Complete Streets" Improvements Traffic Conditions

➢ One (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Year 2024 Cumulative with "Complete Streets" Improvements traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

Year 2024 Cumulative Plus with "Complete Streets" Improvements Project Traffic Conditions

- One (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach with the addition of project traffic, with the inclusion of the "complete streets" improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

    - Intersection No. 2: Atlantic Avenue at South Street
        - Westbound left-turn – AM and PM peak hour

- The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Site Access Evaluation

- The proposed driveway is forecast to operate at acceptable LOS A during both the AM and PM peak hours. Therefore, access to the project site is considered adequate as the current/proposed driveway configurations can accommodate forecast traffic volumes either entering or exiting the Project site.
- Sight lines at the project driveway and Hullet Street are expected to be adequate, therefore, it can be concluded that potential conflicts between the westbound left-turn at the Project driveway and the eastbound left-turn on Hullet Street would be minimal due to adequate visibility.

Congestion Management Program Compliance Assessment

- Based on the proposed Project's trip generation potential, trip distribution and trip assignment, the Project will not add more than 50 at the identified CMP intersections during the weekday AM peak hour or PM peak hour. Therefore, a CMP intersection traffic impact analysis is not required and impacts would be less than significant.
- Based on the project's trip generation potential and distribution pattern, the proposed Project will not add more than 150 trips during the AM or PM peak hour at this CMP mainline freeway-monitoring location. Therefore, a CMP freeway traffic impact analysis is not required.

Transit Impact Review

- The proposed Project is forecast to generate 4 transit trips (2 inbound and 2 outbound) during the AM peak hour and 5 transit trips (3 inbound and 2 outbound) during the PM peak hour. Over a 24-hour period the proposed Project is forecasted to generate 57 daily weekday transit trips. It is anticipated that the existing transit service in the project area would be able to accommodate the project generated transit trips.

Construction Assessment

- The remedial grading construction component is expected to generate 78 daily trips with 12 trips produced during the AM peak hour and 12 trips produced during the PM peak hour. When compared to the trips generated by the proposed Project, the remedial grading construction component is expected to generate 501 *fewer* daily trips, 32 *fewer* trips produced during the AM peak hour, and 36 *fewer* trips produced during the PM peak hour. Therefore, it can be concluded that the construction traffic would not impact the surrounding street system.
- To ensure impacts to the surrounding street system are kept to a minimum, it is recommended that the Construction Management Plan for the proposed Project be developed in coordination with the City of Long Beach prior to the start of construction.

Vehicle Miles Traveled (VMT) Analysis

- For the VMT screening analysis, the presumption of less than significant impact near Transit Stations was applied to the proposed Project. Since the proposed Project is considered to be located within half a mile of an existing high-quality transit corridor, this project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

- Retail Screening: The proposed Project consists of two commercial/retail buildings totaling 2,000 SF which is less than the 50,000 SF threshold for small projects. Therefore, the commercial/retail component of the Project can be screened from further VMT analysis and the commercial/retail component can be presumed to have a less than significant impact on VMT.

- The City of Long Beach has identified a 500 trip threshold for screening small projects. The residential component of the Project falls below the 500 trip threshold for VMT analysis. Therefore, the residential component of the Project can be presumed to have a less than significant impact on VMT. Additionally, the construction and clean-up component of the proposed Project is expected to generate 78 daily trips, which also falls below the 500-trip threshold for VMT analysis. Therefore, the construction and clean-up component of the proposed Project can be presumed to have a less than significant impact on VMT.

REVISED TRAFFIC STUDY

ATLANTIC 84-TOWNHOMES RESIDENTIAL PROJECT

Long Beach, California
June 10, 2021 (Original dated April 20, 2021)

1.0 INTRODUCTION

This traffic study report addresses the potential traffic impacts and circulation needs associated with the Atlantic 84-Townhomes Residential Project (hereinafter referred to as Project). The Project site is located along the eastside of Atlantic Avenue between 59th Street and South Street in the City of Long Beach, California. The Project includes the construction of an 84-unit multifamily residential development with 2,000 SF of restaurant/café uses.

1.1 Scope of Work

This report documents the findings and recommendations of a traffic study, conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts associated with the proposed Project. The traffic analysis evaluates the existing operating conditions at six (6) key study intersections within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future operating conditions without and with the Project. Where necessary, intersection improvements/mitigation measures are identified to offset the impact of the proposed Project. ***Appendix A*** contains the traffic study Scope of Work, which satisfies the traffic study requirements of the *City of Long Beach Traffic Impact Analysis Guidelines, dated June 2020* and in consideration of the requirements and procedures outlined in the most current *Congestion Management Program (CMP) for Los Angeles County.*

The Project site has been visited by LLG and an inventory of adjacent area roadways and intersections was performed. Existing peak hour traffic information has been collected at the six (6) key study locations on a “typical” weekday for use in the preparation of intersection level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the project has been researched at the City of Long Beach. Based on our research, thirteen (13) cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday AM peak hour and PM peak hour traffic level of service (LOS) conditions for a near-term (Year 2024) traffic setting upon completion of the proposed Project. Peak hour traffic forecasts for the Year 2024 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of 0.4% per year and adding traffic volumes generated by thirteen (13) cumulative projects.

1.2 Study Area

The six (6) key study intersections have been identified for evaluation in collaboration with City of Long Beach staff. The key study intersections listed below provide both local and regional access to the study area and define the extent of the boundaries for this traffic impact investigations.

Key Study Intersections

1. Atlantic Avenue at 59th Street
2. Atlantic Avenue at South Street
3. Linden Avenue at 59th Street (north)
4. Linden Avenue at 59th Street (south)
5. Linden Avenue at Hullet Street
6. Linden Avenue at South Street

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the Project and depicts the study locations and surrounding street system. The Delay and Level of Service (LOS) investigations at these key locations, as well as the Project Driveways, were used to evaluate the potential traffic-related impacts associated with the proposed Project.

1.3 Atlantic Avenue "Complete Streets" Improvements

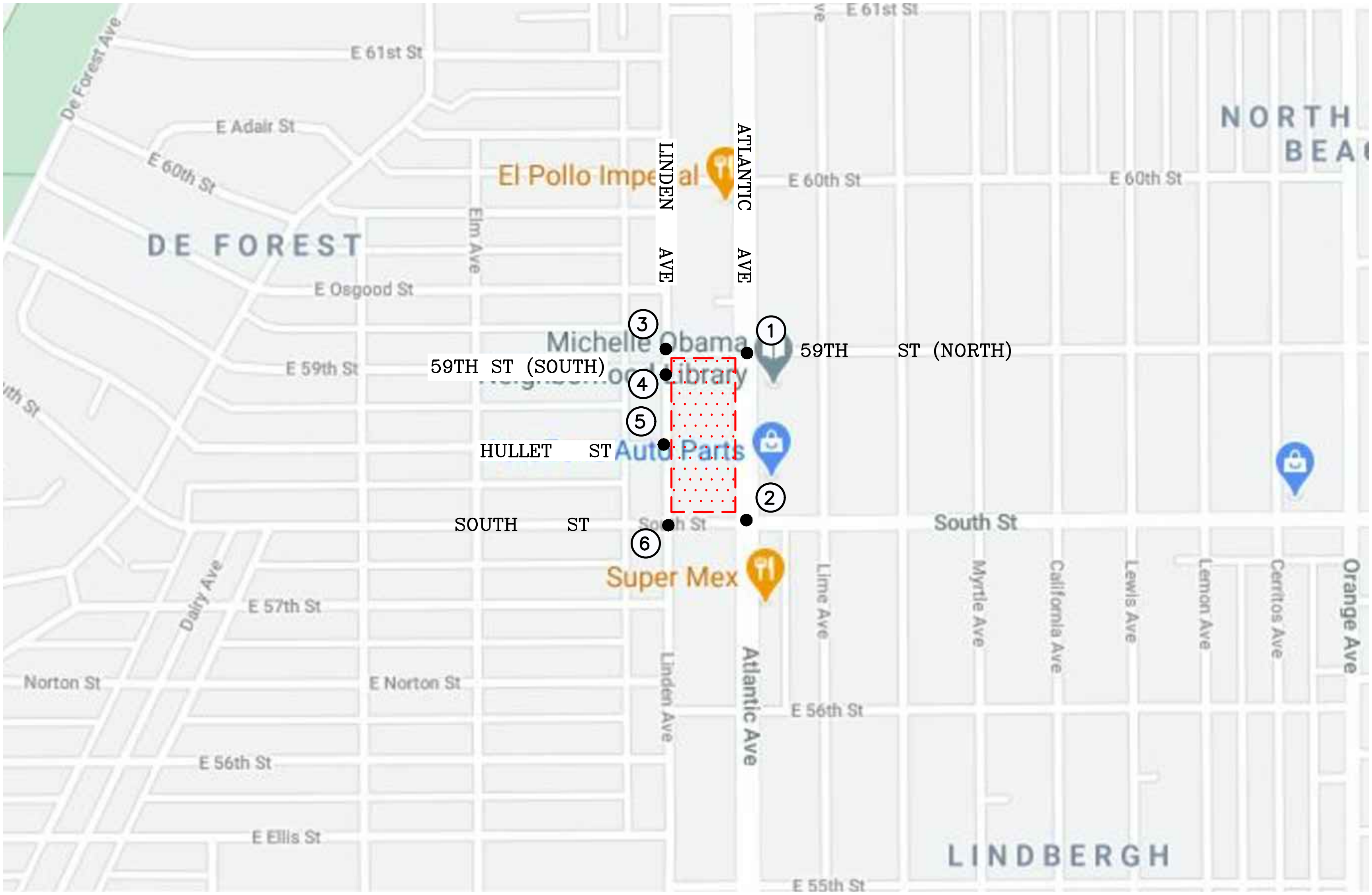
It is our understanding that the City of Long Beach intends to implement multimodal improvements along the northerly section of Atlantic Avenue, between Artesia Boulevard and 51st Street, in an effort to accommodate anticipated growth in North Long Beach. These modifications include converting the segment into a two-lane divided roadway with an on-street "buffered" bike lane and parallel curb side parking and would affect the existing intersection configurations at the following key study locations:

- **Intersection No. 1 Atlantic Avenue at 59th Street:** The implementation of "complete streets" on Atlantic Avenue results in the replacement of the northbound through lane and the southbound through lane with an on-street bike lane with buffer.

- **Intersection No. 2 Atlantic Avenue at South Street:** The implementation of "complete streets" on Atlantic Avenue results in the replacement of the northbound shared through/right turn lane with an on-street bike lane with buffer and an exclusive right-turn lane. The southbound direction results in the removal of the existing through lane to be replaced with an on-street bike lane with buffer.

The timeline to implement these improvements is currently unknown. Therefore, this traffic study will analyze the potential impacts of the proposed Project based on both existing traffic conditions and proposed traffic conditions with the "complete streets" improvements.

It should be noted that with the implementation of the proposed multi-modal improvements, the diversion of traffic to adjacent parallel corridors/neighborhood streets such as Long Beach Boulevard, Orange Avenue, and Cherry Avenue can be expected. As such, to account for this shift in traffic patterns, a twenty percent (20%) reduction in through traffic on Atlantic Avenue will be assumed and included as part of the analysis.



LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 1-1

VICINITY MAP

ATLANTIC RESIDENTIAL, LONG BEACH

Included in this traffic study report are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- AM and PM peak hour capacity analyses for existing conditions without and with the “complete streets” improvements,
- AM and PM peak hour capacity analyses for existing plus project conditions without and with the “complete streets” improvements,
- AM and PM peak hour capacity analyses for future near-term (Year 2024) conditions without and with the “complete streets improvements”,
- AM and PM peak hour capacity analyses for future near-term (Year 2024) plus project conditions without and with the “complete streets” improvements,
- Intersection vehicle queuing analyses,
- Recommended Improvements,
- Site Access Evaluation,
- CMP Compliance Assessment,
- Construction Assessment, and
- VMT Screening Assessment.

2.0 PROJECT DESCRIPTION

The existing site is located along the eastside of Atlantic Avenue, between 59th Street and South Street, and is currently vacant. The proposed Project includes the construction of an 84-unit multifamily residential development with 2,000 SF of restaurant/café uses. Parking for the proposed Project will be provided via 39 on-street parking spaces along with 229 spaces located on-site. The on-site spaces include 168 attached garage spaces and 22 surface parking stalls. ***Figure 2-1*** displays the existing site aerial. ***Figure 2-2*** presents the Project's proposed site plan.

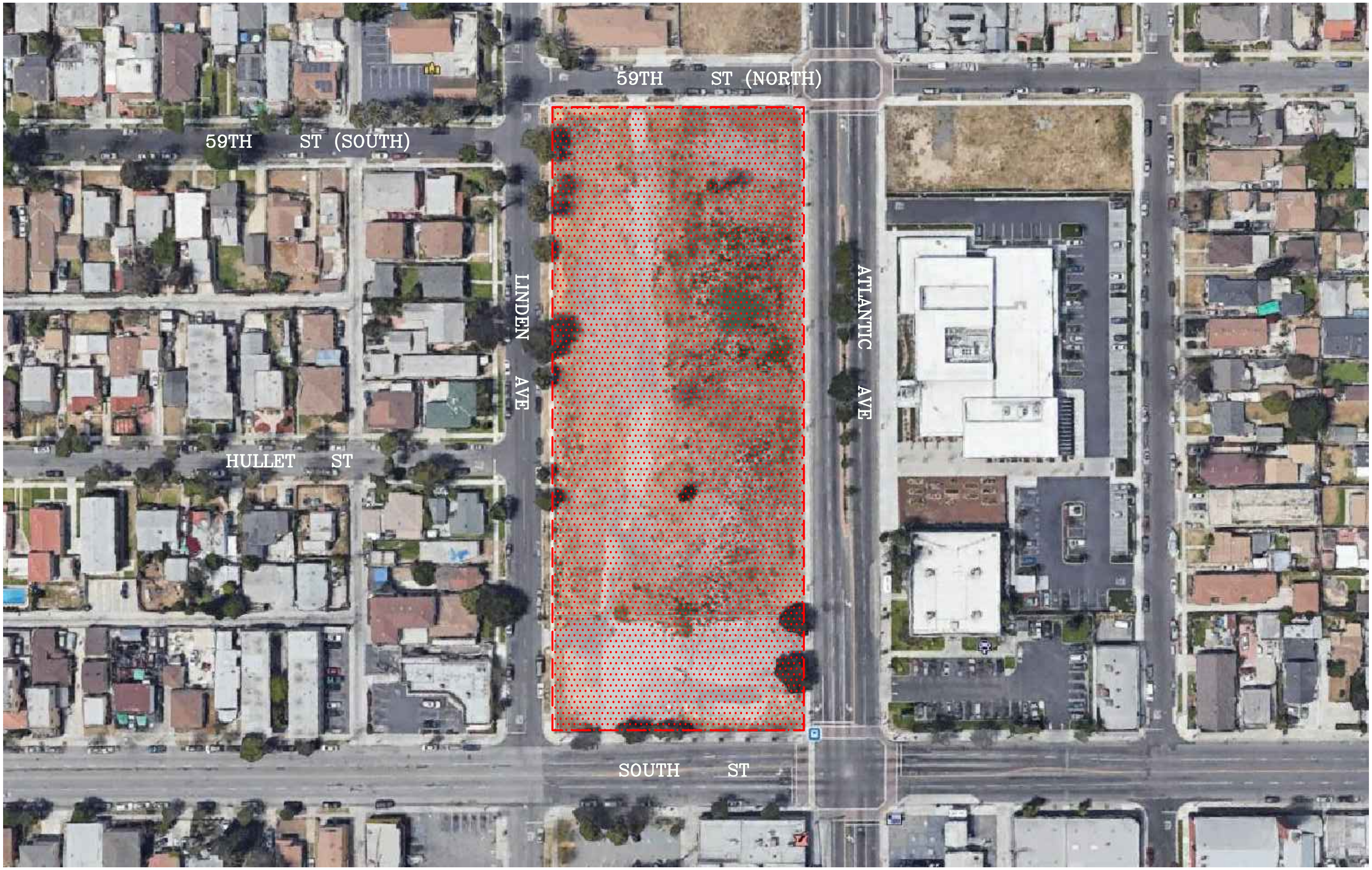
2.1 Site Access

As shown in *Figure 2-2*, vehicular access to the Project site will be provided via an unsignalized full access driveway located midblock along Linden Avenue.

2.2 Pedestrian Circulation

Pedestrian circulation will be provided via existing public sidewalks along Linden Avenue, 59th Street, South Street and Atlantic Avenue within the vicinity of the Project frontage. The proposed Project will protect the existing sidewalks along Linden Avenue, 59th Street, South Street, and Atlantic Avenue, and if necessary, repair or construct new sidewalks along the project frontage per the City's request.

Existing pedestrian facilities within the project area are adequate. Sidewalks are generally provided throughout the City along with crosswalks at most major intersections. In close proximity to the site, the intersections of Atlantic Avenue/59th Street and Atlantic Avenue/South Street provide pedestrians connectivity via the existing intersection crosswalk linking the project site to the surrounding community to the north and south, as well as on along the east side of Atlantic Avenue.



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▨ = PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL

ATLANTIC RESIDENTIAL, LONG BEACH

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SOURCE: WITHEE MALCOM ARCHITECTS

FIGURE 2–2

PROPOSED SITE PLAN

ATLANTIC RESIDENTIAL, LONG BEACH

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The principal local network of streets serving the project site includes Atlantic Avenue, 59th Street, South Street, and Linden Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Atlantic Avenue is a four-lane, divided roadway oriented in the north-south direction. The posted speed limit is 30 miles per hour (mph). Parking is generally permitted on both sides of the roadway within the vicinity of the project. A traffic signal controls the study intersections of Atlantic Avenue at 59th Street and South Street.

59th Street is a two-lane undivided roadway oriented in the east-west direction. The posted speed limit is 25 mph. Parking is permitted on both sides of the roadway within the vicinity of the project.

South Street is a four-lane, divided roadway oriented in the east-west direction. The posted speed limit is 35 mph. Parking is permitted on both sides of the roadway within the vicinity of the project.

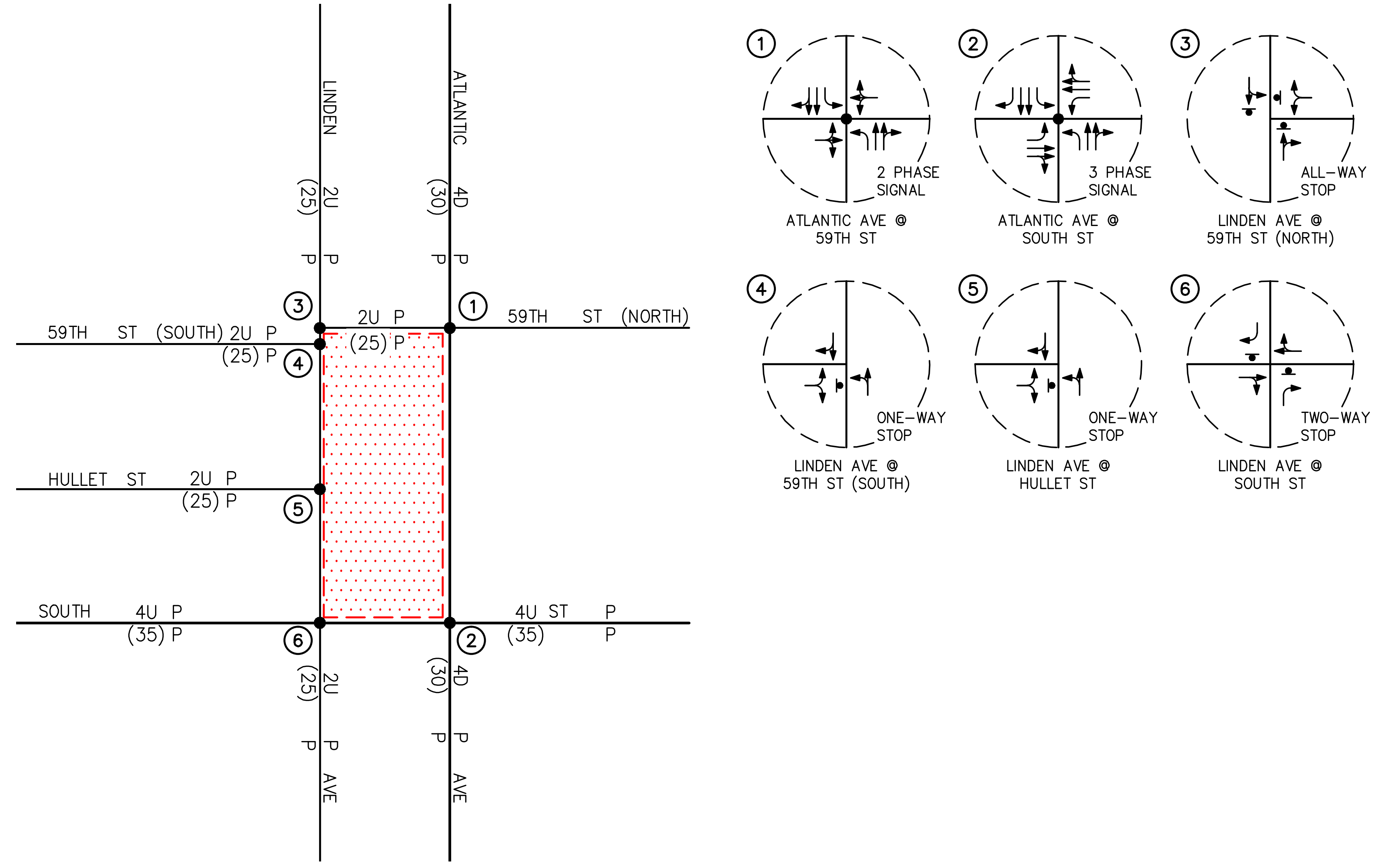
Linden Avenue is a two-lane undivided roadway oriented in the north-south direction. The posted speed limit is 25 mph. Parking is permitted on both sides of the roadway within the vicinity of the project.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. The number of travel lanes and intersection controls for the key area intersections are identified.

Figure 3-2 presents the roadway conditions with the planned “complete streets” improvements along Atlantic Avenue. The number of travel lanes and intersection controls for the key area intersections are identified. As mentioned previously, the “complete streets” improvements results in the conversion of Atlantic Avenue to a two-lane divided roadway with an on-street "buffered” bike lane and parallel curb side parking.

3.2 Existing Traffic Volumes

Due to the COVID-19 virus, the Governor of California has issued a state-wide “stay at home” order which has ultimately resulted in a decrease in traffic. Based on these current conditions, the ability to collect traffic counts to establish baseline conditions that would be reflective of traffic conditions without “stay at home” orders in effect are not possible. As such, to establish “baseline” traffic conditions, pre-COVID-19 (i.e. under normal circumstances without “stay at home” orders in effect), LLG has researched historic data and was able to obtain Year 2019 counts at two (2) of the study locations as summarized below:



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GREENSPAN
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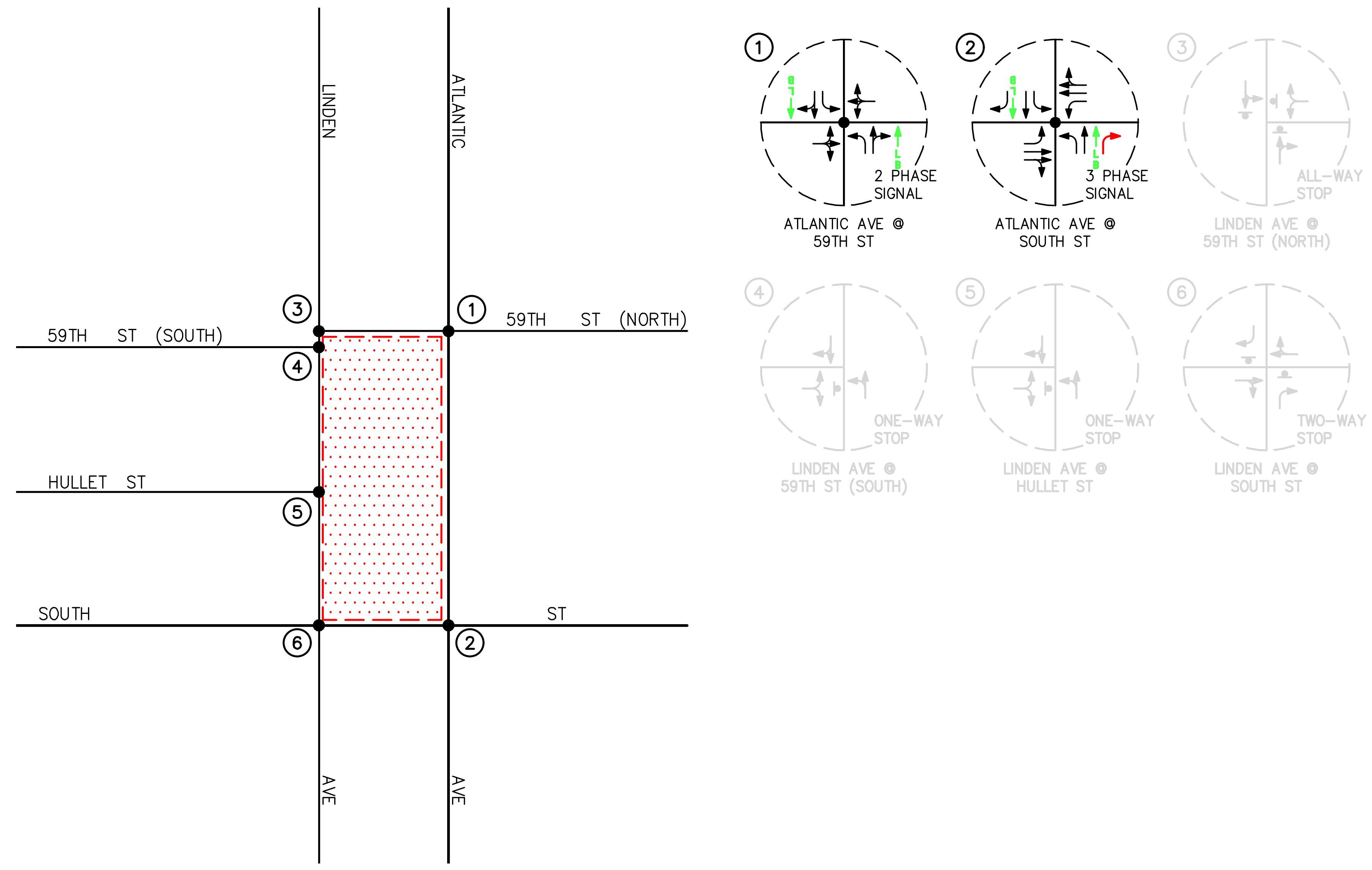
KEY

← = APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ⊥ = STOP SIGN
P = PARKING, NP = NO PARKING
U = UNDIVIDED, D = DIVIDED
2 = NUMBER OF TRAVEL LANES
(XX) = POSTED SPEED LIMIT (MPH)
▨ = PROJECT SITE

FIGURE 3–1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

ATLANTIC RESIDENTIAL, LONG BEACH



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NO SCALE

KEY

← = EXISTING LANE

← = PROPOSED COMPLETE STREETS IMPROVEMENTS

← = BIKE LANE

● = TRAFFIC SIGNAL, ┳ = STOP SIGN

▨ = PROJECT SITE

FIGURE 3–2

ATLANTIC AVENUE "COMPLETE STREETS" PLANNED IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH

Key Intersection	Historic Year 2019 Traffic Counts Available	Collect Year 2021 COVID-19 Traffic Counts
1. Atlantic Avenue at 59th Street	Yes	Yes
2. Atlantic Avenue at South Street	Yes	Yes
3. Linden Avenue at 59th Street (north)	--	Yes
4. Linden Avenue at 59th Street (south)	--	Yes
5. Linden Avenue at Hullet Street	--	Yes
6. Linden Avenue at South Street	--	Yes

Given the availability of historic data, the following steps were used to establish Existing Year 2021 pre-COVID-19 baseline traffic conditions:

(1) Historic data is available at two locations for Year 2019 (i.e. Intersections No. 1 and No. 2).

(2) Given data is not available at four study locations (i.e. Intersections No. 3, No. 4, No. 5 and No. 6), LLG collected Year 2021 COVID-19 traffic counts at all study locations for use in establishing traffic counts/turning movement percentages. These traffic counts were collected in March 2021 by National Data and Surveying Services, Inc.

(3) Using information from (1) and (2), compare 2019 to 2021 to establish change in traffic counts due to current COVID-19 environment.

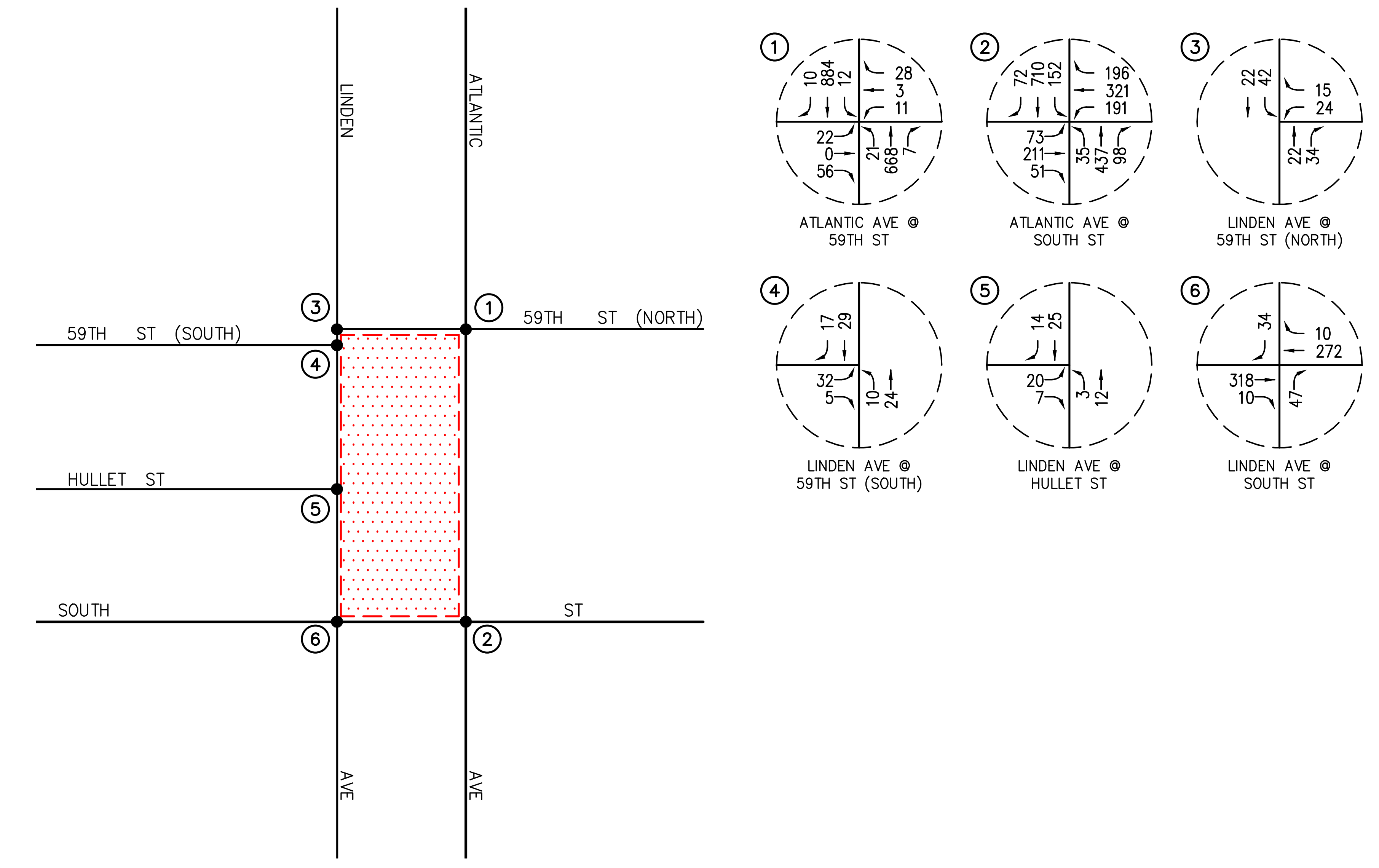
(4) Apply the rate calculated in (3) to 2021 COVID-19 traffic counts, and forecast 2019 baseline traffic conditions for Intersections No. 3, No. 4, No. 5, and No. 6.

(5) Lastly, apply an annual growth factor of 0.4% per year for two years to the Year 2019 baseline traffic conditions to establish Year 2021 pre-COVID-19 baseline traffic conditions.

Figures 3-3 and ***3-4*** illustrate the Year 2021 existing AM and PM peak hour traffic volumes at the six (6) key study intersections evaluated in this report.

Figures 3-5 and ***3-6*** illustrate the Year 2021 existing AM and PM peak hour traffic volumes at the six (6) key study intersections and include adjustments to account for the "complete streets" improvements.

Appendix B contains a summary table for the Year 2021 pre-COVID-19 baseline volume development as well as the detailed peak hour traffic count sheets for the key intersections evaluated in this report.



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(#) = STUDY INTERSECTION
▨ = PROJECT SITE

FIGURE 3-3

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH

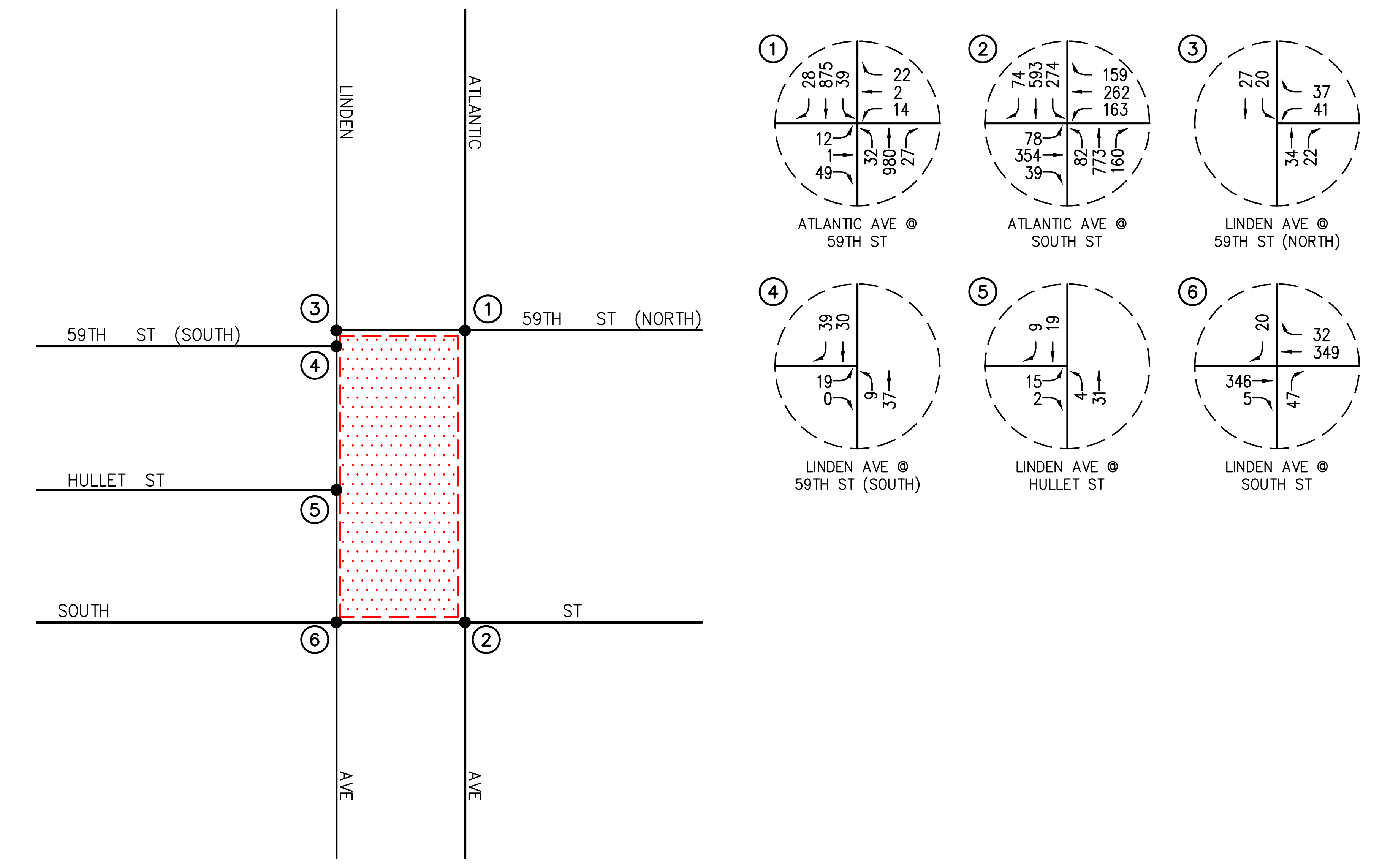

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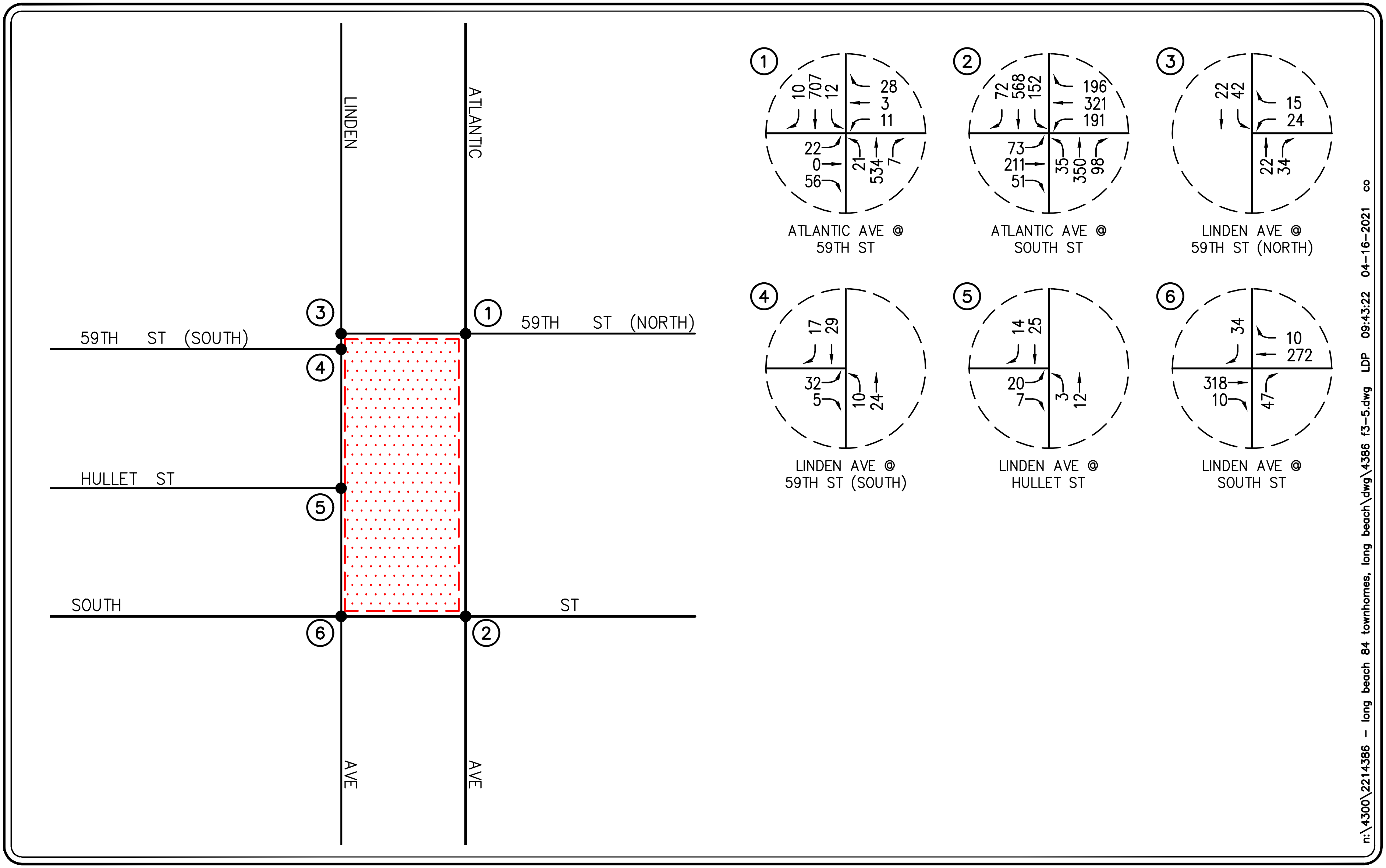
FIGURE 3–4

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH



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KEY

\# = STUDY INTERSECTION

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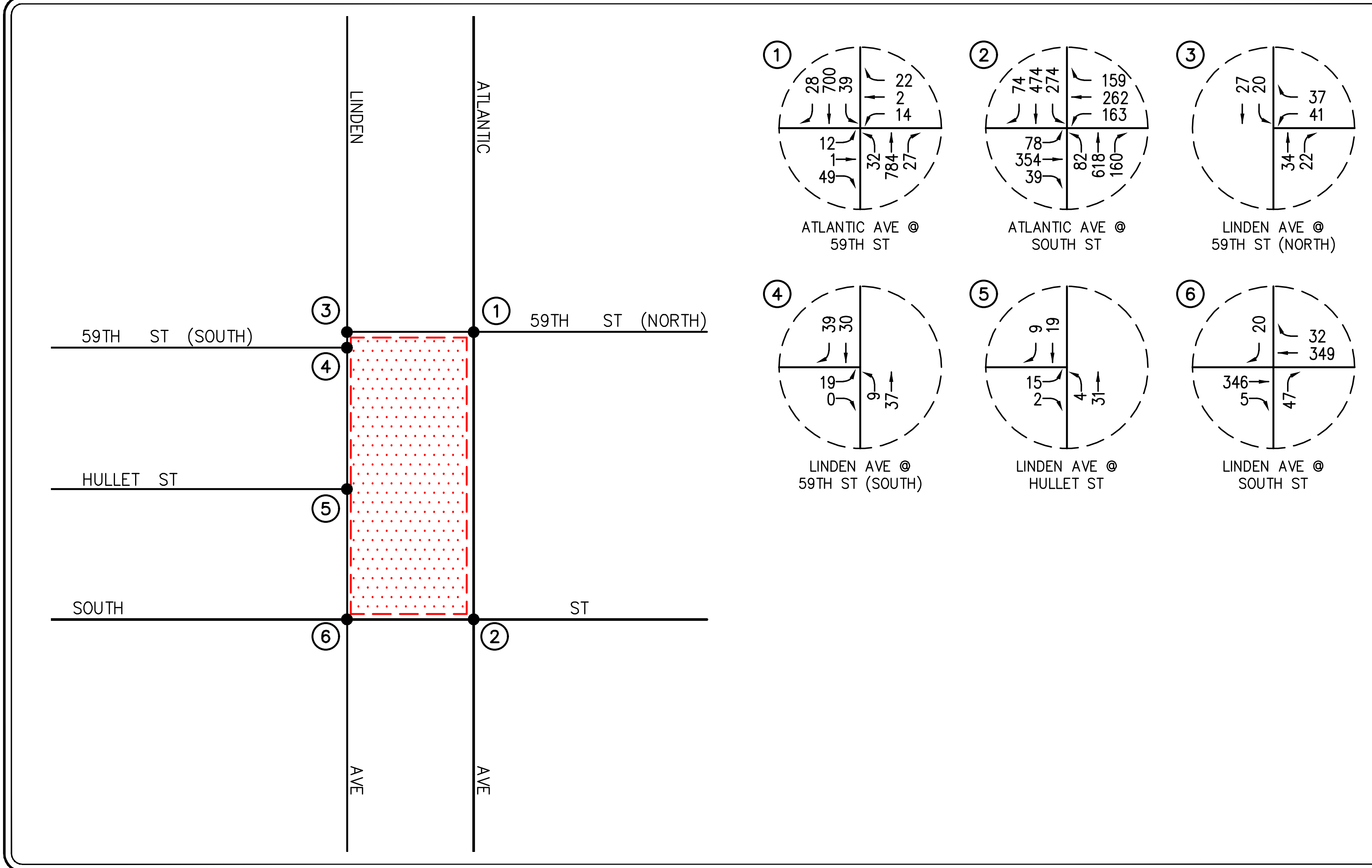
FIGURE 3–5

EXISTING AM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH



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(#) = STUDY INTERSECTION
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FIGURE 3–6

EXISTING PM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH

3.3 Existing Public Transit

The Long Beach Transit (LBT) provide public transit services in the vicinity of the proposed Project. In the vicinity of the Project, LBT Routes 61 and 192 currently serves Atlantic Boulevard and South Street, respectively. ***Figure 3-7*** graphically illustrates the transit routes of Long Beach Transit within the vicinity of the Project site. ***Figure 3-8*** identifies the location of the existing bus stops in proximity to the Project site.

3.4 Existing Bicycle Master Plan

The City of Long Beach promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bicycle Master Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The City of Long Beach Bicycle Master Plan is shown on ***Figure 3-9***.

Review of *Figure 3-9* indicates that the nearest existing bike lanes are located north of the project site, which include Class II bike lanes along Harding Street and Atlantic Avenue, north of Harding Street. However, based on the City of Long Beach Bicycle Master Plan, and consistent with the aforementioned "complete streets" improvements, the City plans implement "8-to-80" bikeways along Atlantic Avenue and South Street[1].

3.5 Existing Intersection Conditions

Pursuant to the City of Long Beach guidelines and in conformance with the City's Mobility Element, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Highway Capacity Manual* (HCM) methodology.

3.5.1 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

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

In the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay.* Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that

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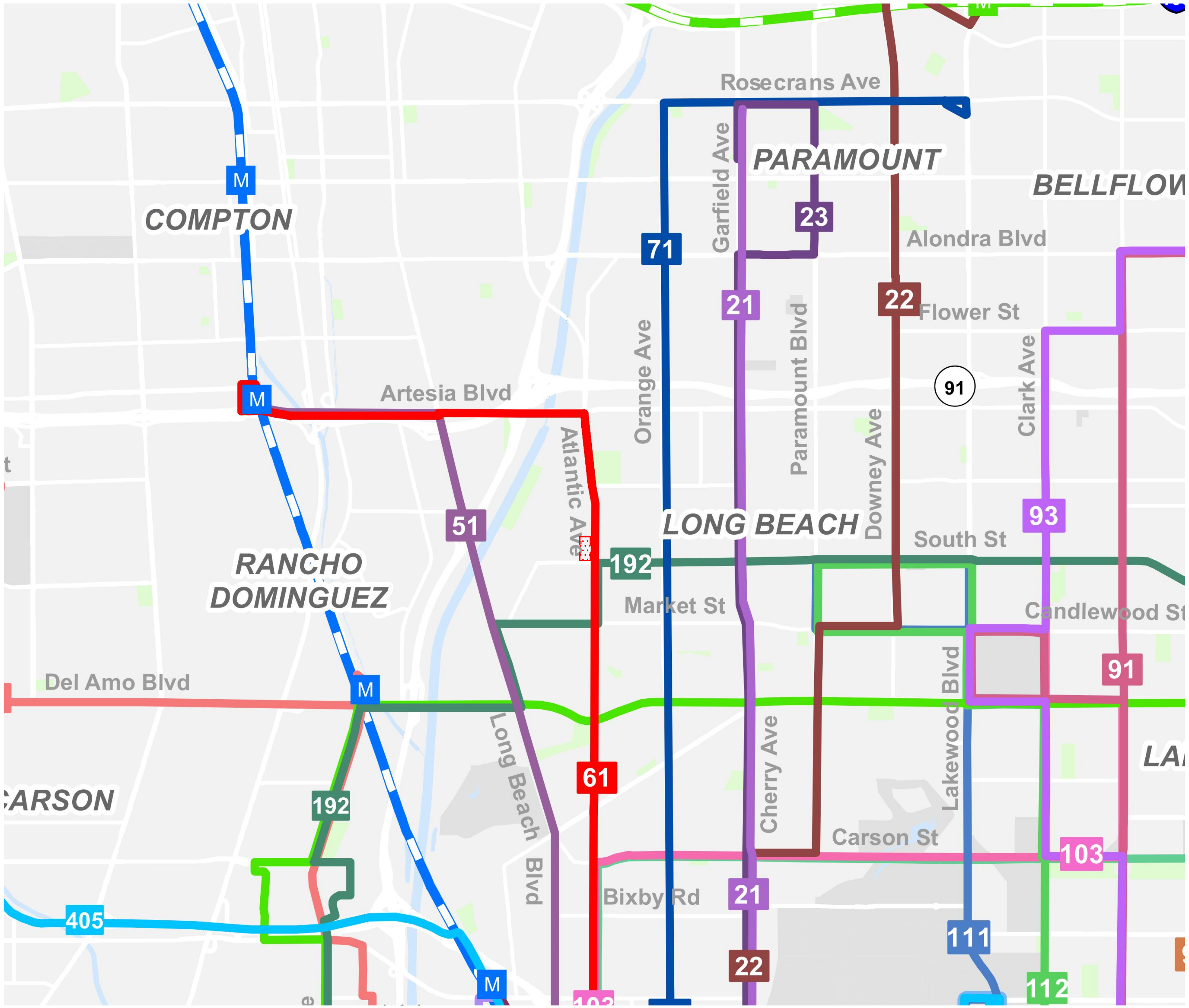
[1] City of Long Beach Bicycle Master Plan Figure 6-5, Page 73 (February 2017). An "8-to-80" bikeway is defined as bikeways that are designed to serve cyclists of all ages comfortably and safely.



SOURCE: LONG BEACH TRANSIT

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▨ = PROJECT SITE

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FIGURE 3–7

LONG BEACH TRANSIT MAP

ATLANTIC RESIDENTIAL, LONG BEACH

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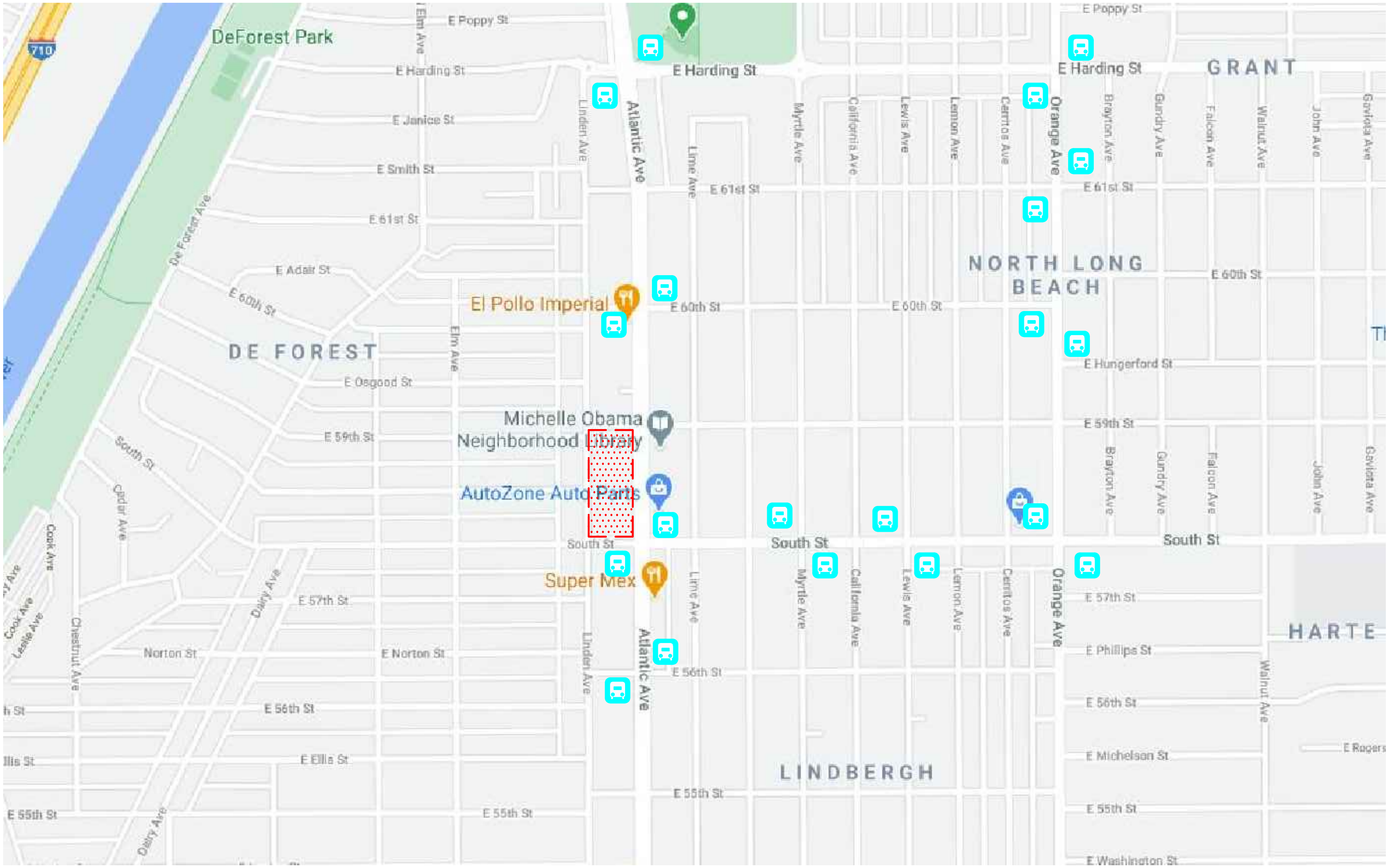

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SOURCE: GOOGLE

KEY

▨ = PROJECT SITE

🚌 = TRANSIT STOP

FIGURE 3–8

TRANSIT STOP LOCATIONS

ATLANTIC RESIDENTIAL, LONG BEACH

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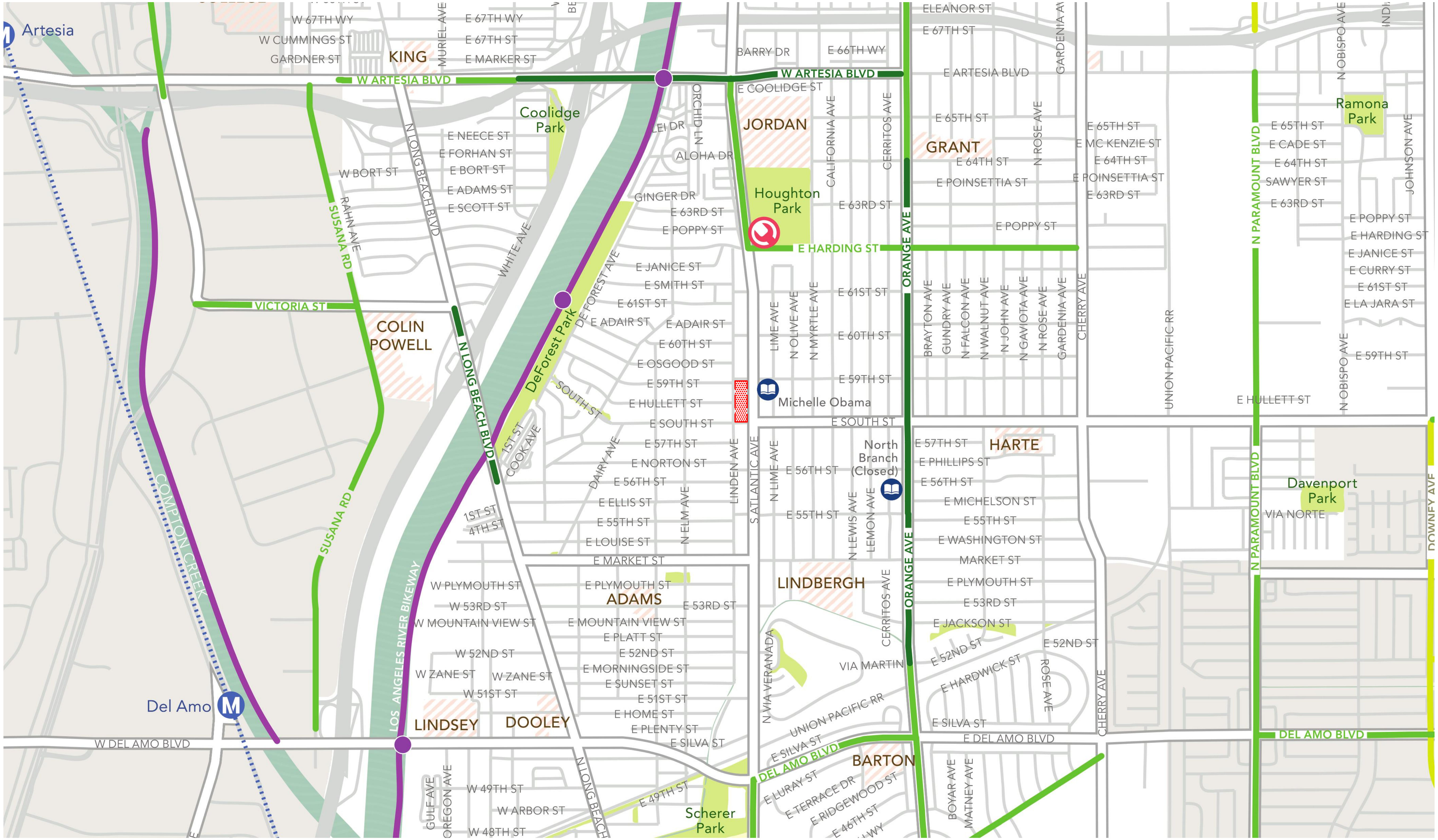

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SOURCE: CITY OF LONG BEACH

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▨ = PROJECT SITE

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FIGURE 3-9

LONG BEACH BICYCLE MASTER PLAN

ATLANTIC RESIDENTIAL, LONG BEACH

have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 3-1***.

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

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

3.5.3 *Level of Service Criteria*

According to the City of Long Beach, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, or the current LOS if the existing LOS is worse than LOS D (i.e. LOS E of F).

3.6 Existing Level of Service Results

Table 3-3 summarizes the existing peak hour service level calculations for the six (6) key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-3* indicates that all of the key study intersections currently operate at LOS C or better during the weekday AM and PM peak hours.

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

3.7 Existing Level of Service Results with “Complete Streets” Improvements

Table 3-4 summarizes the existing peak hour service level calculations for the six (6) key study intersections based on existing traffic volumes and proposed “complete streets” improvements on Atlantic Avenue. Review of *Table 3-4* indicates that all of the key study intersections are forecast to operate at LOS C or better during the weekday AM and PM peak hours, assuming implementation of the intersection lane configurations as identified in *Figure 3-2.*

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

TABLE 3-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM)[2]

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

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

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM)[3]

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

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[3] Source: *Highway Capacity Manual 6th Edition*, Chapter 20 (Two-Way Stop Control).

TABLE 3-3

EXISTING (YEAR 2021) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection		Time Period	Control Type	Delay (s/v)	LOS
1.	Atlantic Avenue at	AM	2∅ Traffic Signal	5.1	A
	59th Street	PM		4.9	A
2.	Atlantic Avenue at	AM	3∅ Traffic Signal	20.1	C
	South Street	PM		22.5	C
3.	Linden Avenue at	AM	All-Way Stop	7.5	A
	59th Street (north)	PM		7.5	A
4.	Linden Avenue at	AM	One-Way Stop	9.4	A
	59th Street (south)	PM		9.4	A
5.	Linden Avenue at	AM	One-Way Stop	8.9	A
	Hullet Avenue	PM		9.1	A
6.	Linden Avenue at	AM	Two-Way Stop	10.9	B
	South Street	PM		11.3	B

Notes:

- LOS = Level of Service, please refer to *Tables 3-1* and *3-2* for the LOS definitions
- ∅ = Phase
- s/v = seconds per vehicle (delay)

TABLE 3-4

EXISTING (YEAR 2021) WITH "COMPLETE STREETS" IMPROVEMENTS PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection		Time Period	Control Type	Delay (s/v)	LOS
1.	Atlantic Avenue at	AM	2∅ Traffic Signal	6.8	A
	59th Street	PM		6.7	A
2.	Atlantic Avenue at	AM	3∅ Traffic Signal	23.0	C
	South Street	PM		23.9	C
3.	Linden Avenue at	AM	All-Way Stop	7.5	A
	59th Street (north)	PM		7.5	A
4.	Linden Avenue at	AM	One-Way Stop	9.4	A
	59th Street (south)	PM		9.4	A
5.	Linden Avenue at	AM	One-Way Stop	8.9	A
	Hullet Avenue	PM		9.1	A
6.	Linden Avenue at	AM	Two-Way Stop	10.9	B
	South Street	PM		11.3	B

Notes:

- LOS = Level of Service, please refer to *Tables 3-1* and *3-2* for the LOS definitions
- ∅ = Phase
- s/v = seconds per vehicle (delay)

4.0 TRAFFIC FORECASTING METHODOLOGY

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

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

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

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

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

The trip generation potential of the proposed Project will be estimated using trip rates contained in the 10th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the Project's forecast peak hour and daily traffic volumes. As shown in the upper portion *Table 5-1*, ITE Land Use 221: Multifamily Housing Mid-Rise and ITE Land Use 932: High-Turnover Sit-Down Restaurant were used to forecast the trip generation potential of the proposed Project.

A review of the lower portion of this table indicates that the proposed Project is forecast to generate approximately 579 daily trips, with 44 trips (16 inbound, 28 outbound) produced in the AM peak hour and 48 trips (30 inbound, 18 outbound) produced in the PM peak hour on a "typical" weekday.

Please note that a 5% non-auto trip reduction was applied to the trip generation to account for other modes of transportation (i.e. public transit, walking, biking, etc.).

Based on Section 1.3 of the *City of Long Beach Traffic Impact Analysis Guidelines,* traffic impact studies are required for any project in Long Beach that is expected to generate 500 or more net new daily trips, including both inbound and outbound trips. Given the results of the proposed Project's trip generation forecast, the proposed Project trips are expected to generate just over 500 additional daily trips. Therefore, the added peak hour Project trips, which amount to 44 AM peak hour trips and 48 PM peak hour trips are evaluated in the following sections of this traffic study.

TABLE 5-1

PROJECT TRAFFIC GENERATION FORECAST[4]

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Rates:							
▪ 221: Multifamily Housing (Mid-Rise[5]) (TE/DU)	5.44	26%	74%	0.36	61%	39%	0.44
▪ 932: High Turnover Sit Down Restaurant (TE/1000 SF)	112.18	55%	45%	9.94	62%	38%	9.77
Generation Forecasts:							
▪ 220: Apartments (84 DU)	457	8	22	30	23	14	37
Internal Capture[6]	*-36*	*0*	*-2*	*-2*	*-1*	*-2*	*-3*
Subtotal	421	8	20	28	22	12	34
▪ 932: Restaurant (2,000 SF)	224	11	9	20	12	8	20
Internal Capture[6]	-36	-2	0	-2	-2	-1	-3
Subtotal	*188*	*9*	*9*	*18*	*10*	*7*	*17*
Project Trip Generation Subtotal	**609**	**17**	**29**	**46**	**32**	**19**	**51**
Non-Auto Trip Adjustment (5%)	**-30**	**-1**	**-1**	**-2**	**-2**	**-1**	**-3**
Net Trip Generation Potential	**579**	**16**	**28**	**44**	**30**	**18**	**48**

Notes:
TE/DU = Trip end per dwelling unit
TE/1000 SF = Trip end per 1,000 SF

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

[5] Mid Rise Multifamily Housing consists of buildings that range between 3 and 10 levels.

[6] Consistent with the *Trip Generation Handbook*, published by ITE (2017). Project trip generation was adjusted to account for internal capture between the apartment buildings and the restaurant components of the Project.

5.2 Project Traffic Distribution and Assignment

Figure 5-1 illustrates the general, directional traffic distribution pattern for the proposed Project. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- ingress/egress availability at the project site, plus parking layout and allocation within the subject property, and
- input from City staff.

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

Additionally, ***Table 5-2*** presents a summary of the project-related added peak hour traffic volumes at the six (6) study intersections, based on the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-1,* and indicates whether the project trips exceed the City of Long Beach's peak hour trip threshold of 50 trips, which historically had been used as a screening threshold for requiring a traffic study. Review of *Table 5-2* shows that none of the six key study intersections meet or exceed the peak hour trip threshold for analysis. However, they have been included in this analysis per the City's requirements to fully assess the Project's circulation needs in the immediate area of the Project bordering the subject property.

5.3 Existing Plus Project Traffic Conditions

The Existing Plus Project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared to assess the potential impacts of a Project upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

Figures 5-4 and ***5-5*** present projected AM and PM peak hour traffic volumes at the six (6) key study intersections with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively.

Figures 5-6 and ***5-7*** present projected AM and PM peak hour traffic volumes at the six (6) key study intersections with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively, and include adjustments to account for the "complete streets" improvements.

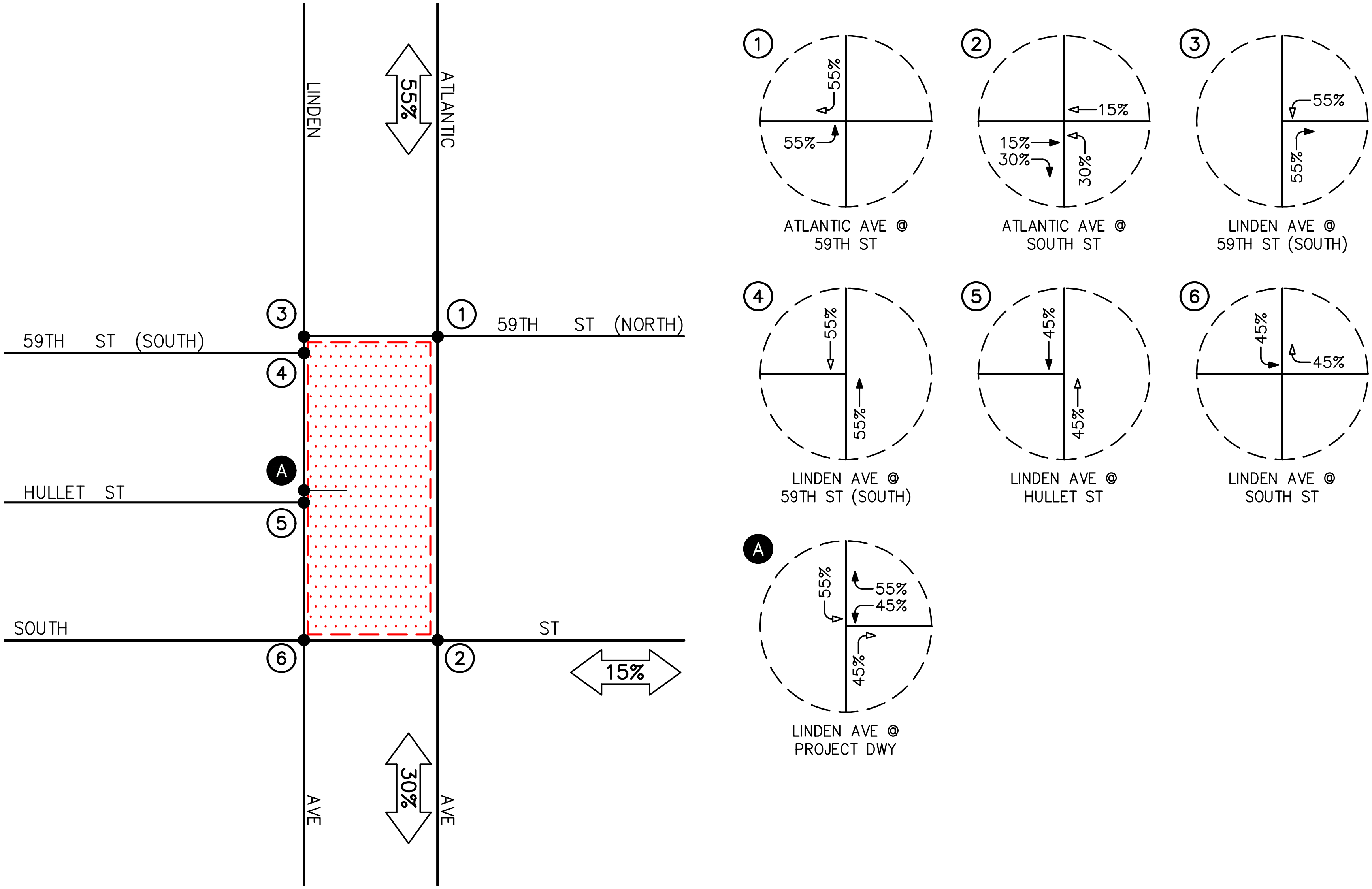

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FIGURE 5–1

PROJECT TRIP DISTRIBUTION PATTERN

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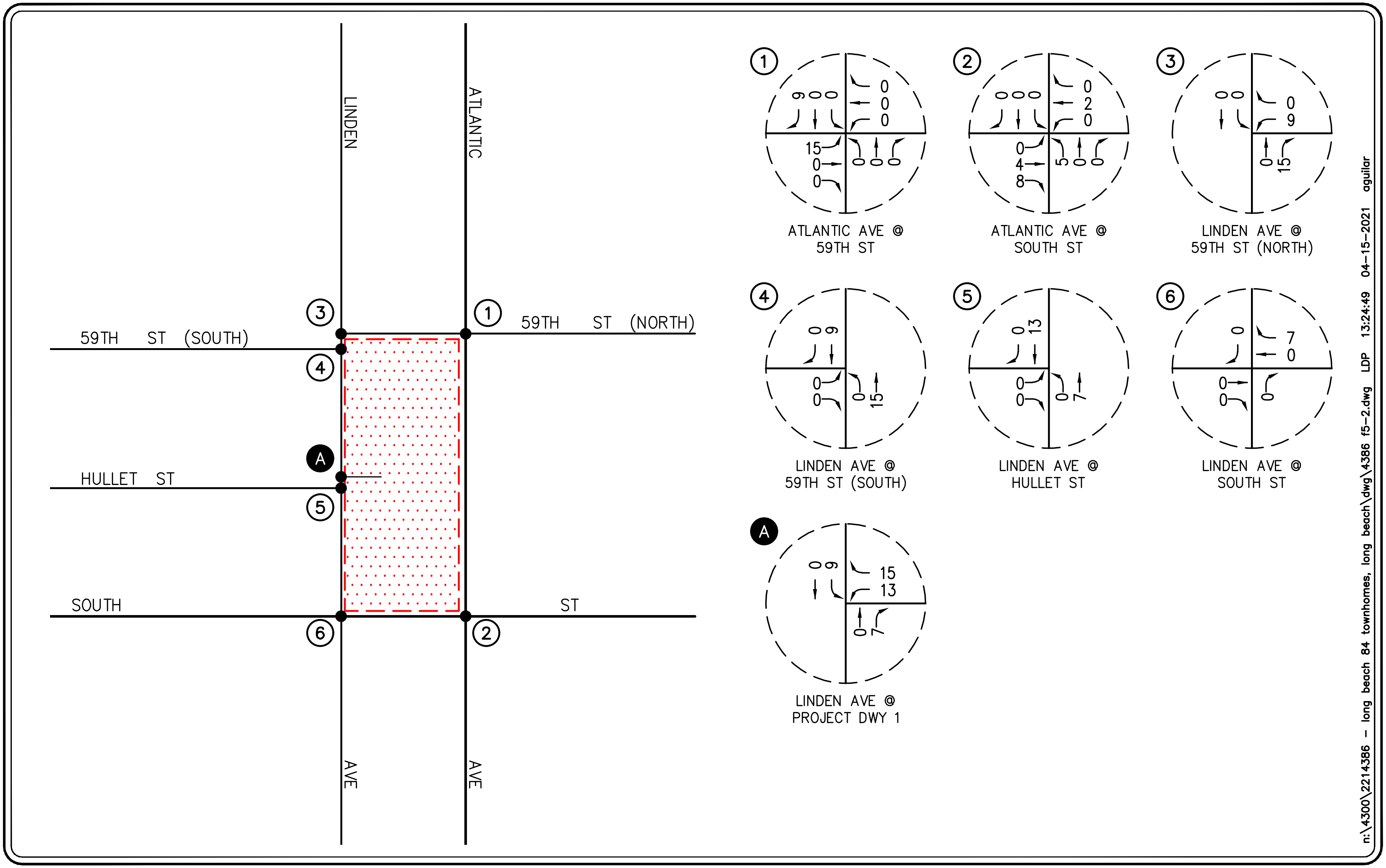

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FIGURE 5–2

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

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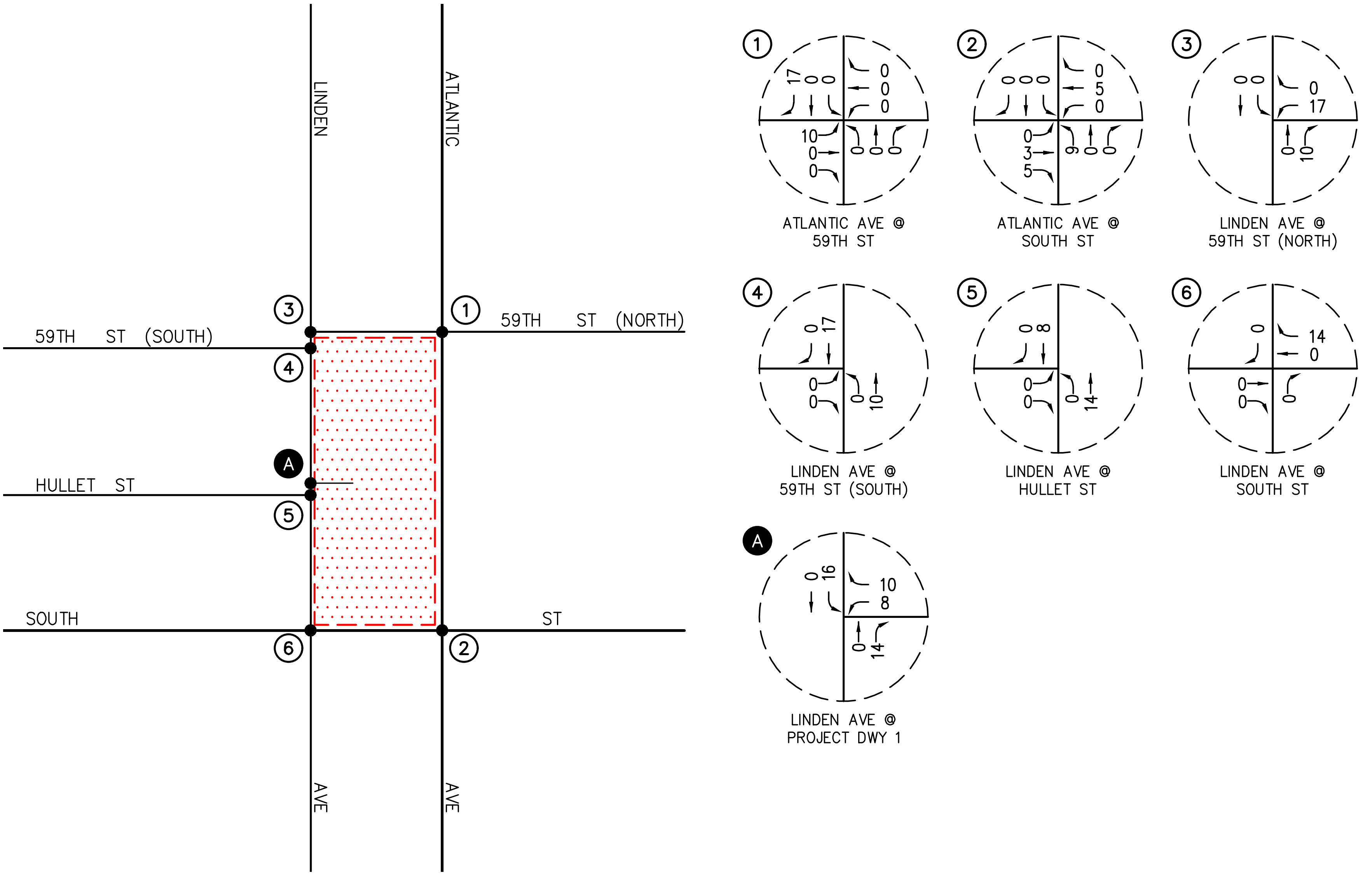

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FIGURE 5–3

PM PEAK HOUR PROJECT TRAFFIC VOLUMES

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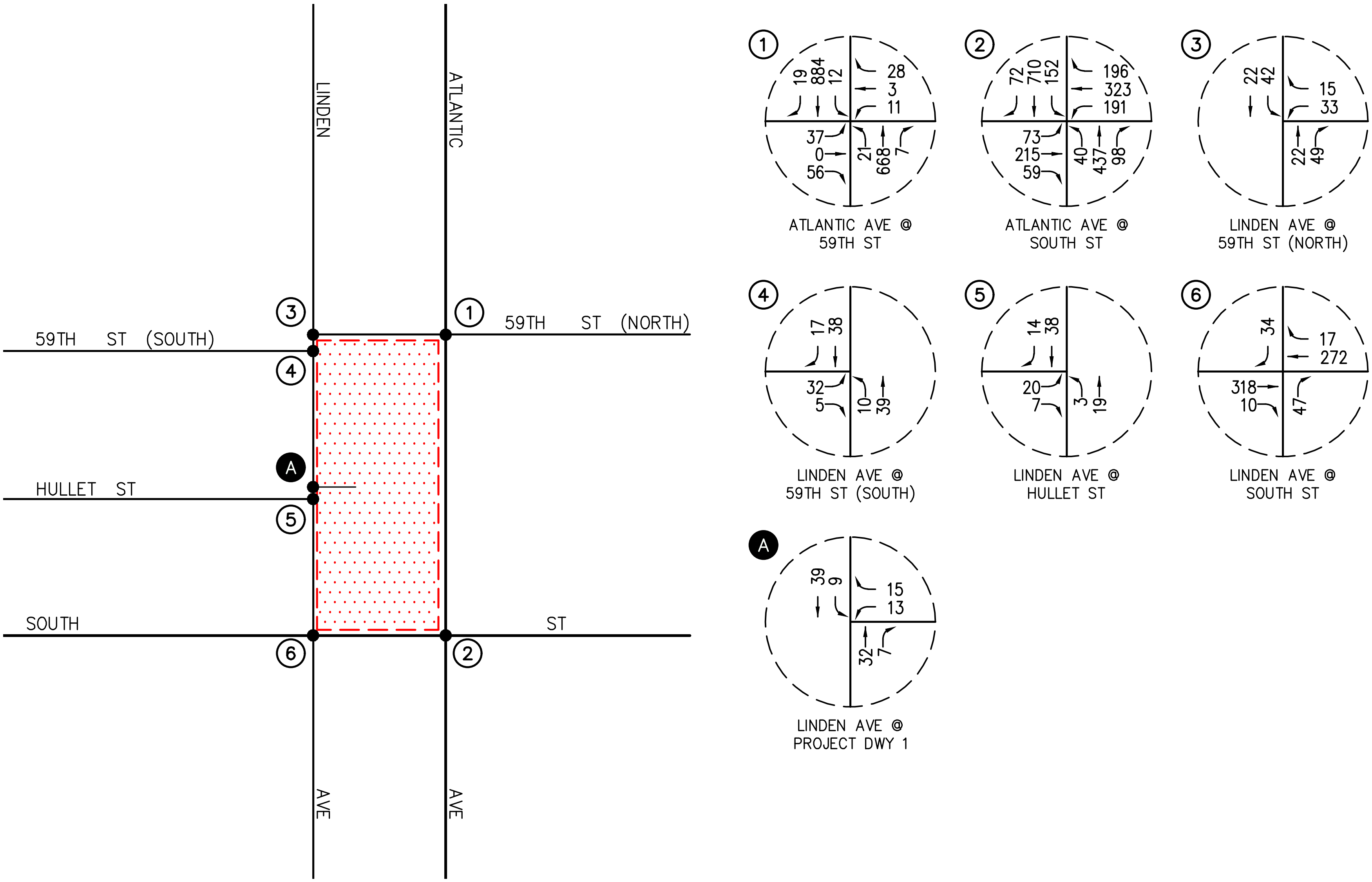

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FIGURE 5–4

EXISTING PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES

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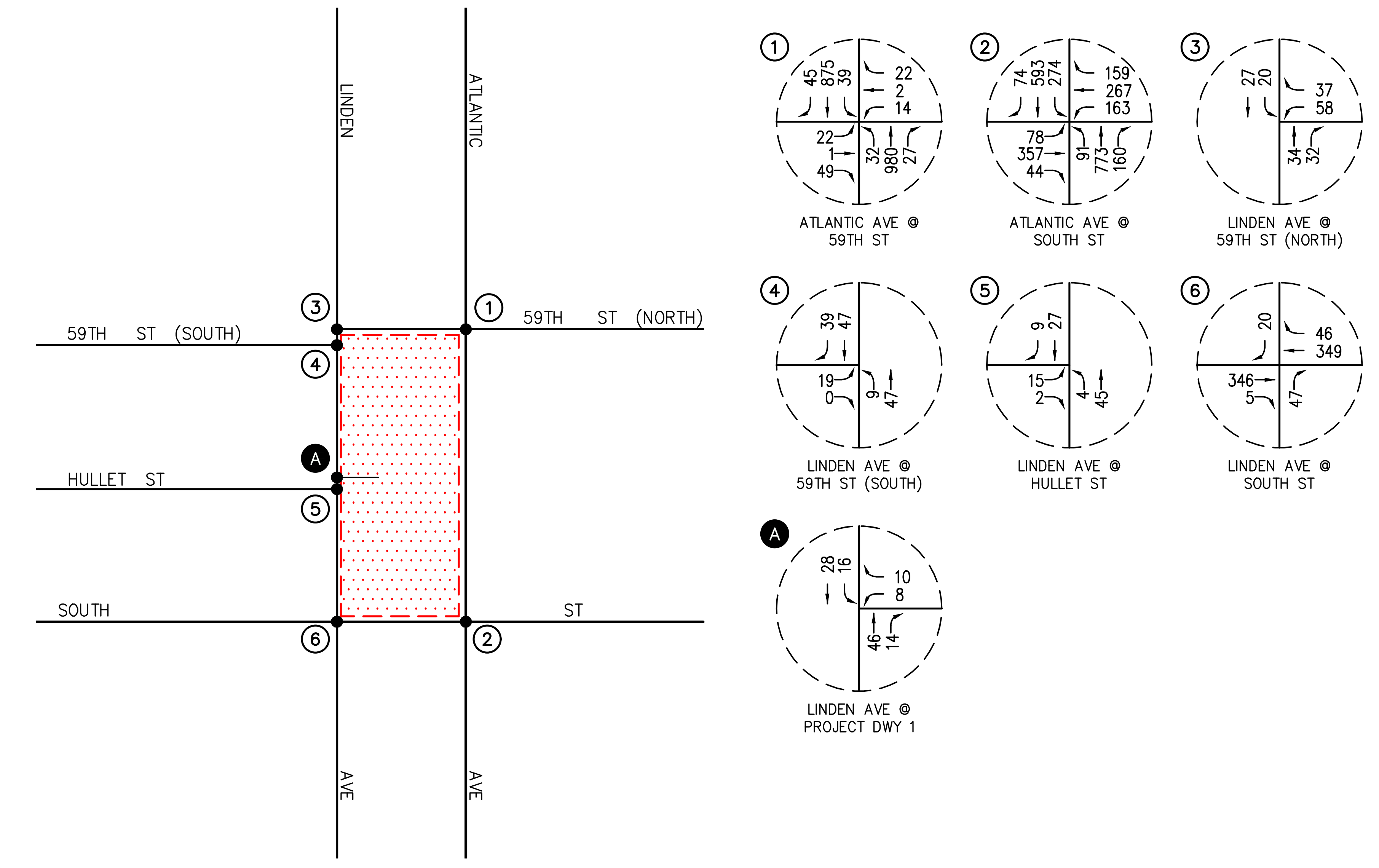

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FIGURE 5–5

EXISTING PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH

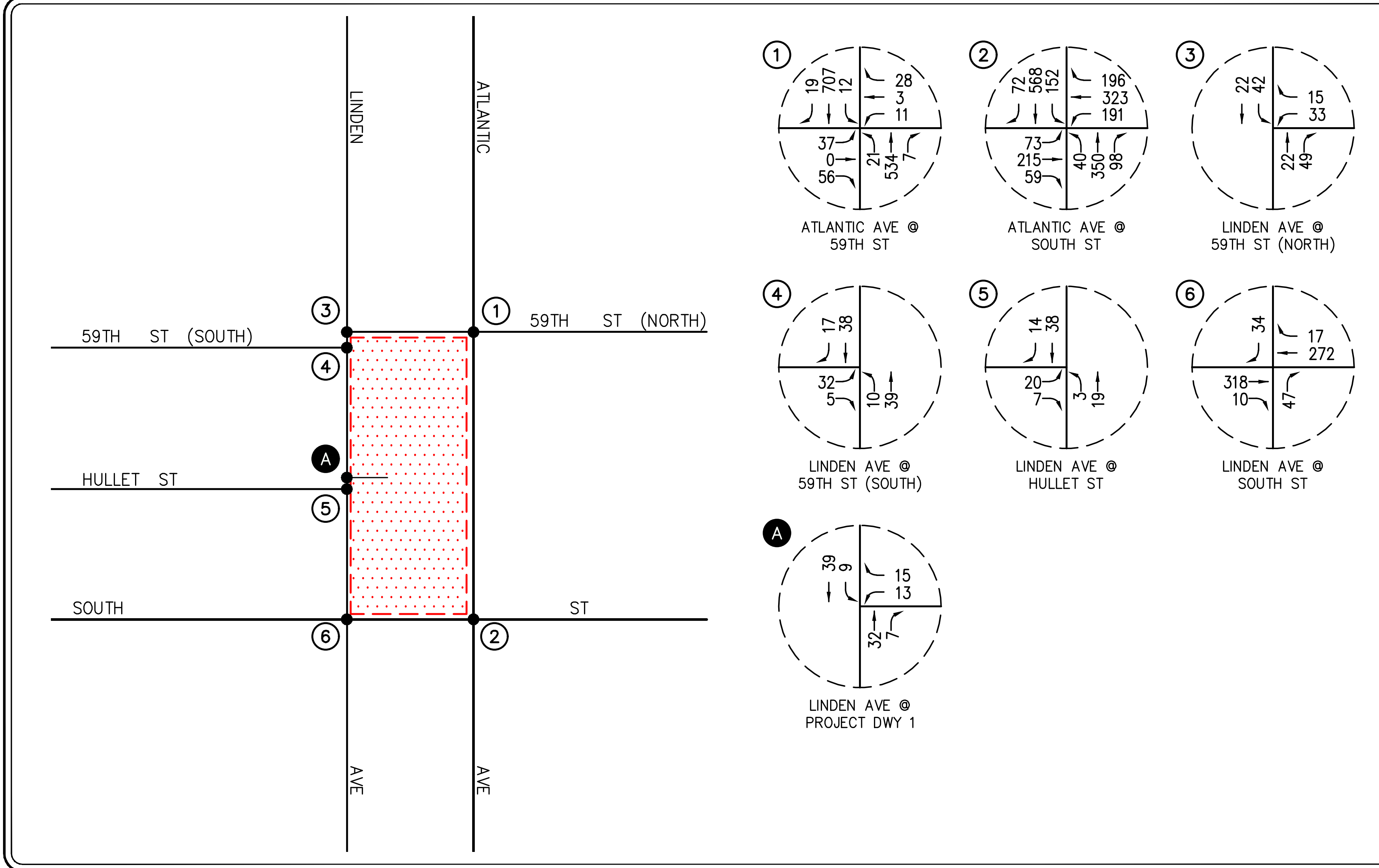

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FIGURE 5–6

EXISTING PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH

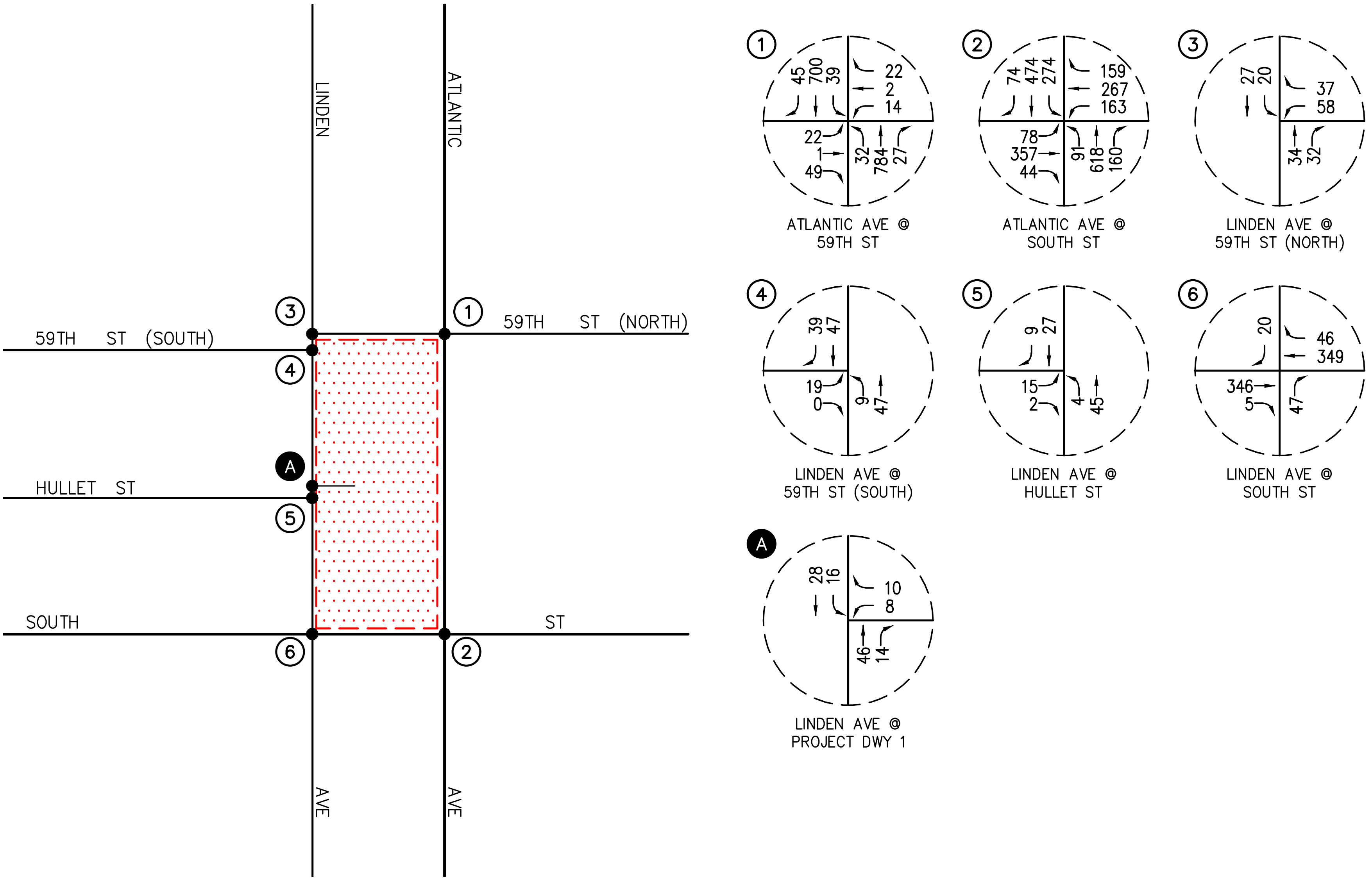

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FIGURE 5-7

EXISTING PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH

TABLE 5-2

PROJECT-RELATED ADDED PEAK HOUR TRAFFIC VOLUMES

Key Intersection		Time Period	Added Peak Hour Project Trips	Exceed City of Long Beach "50 Peak Hour Trip" Threshold (Yes/No)
1.	Atlantic Avenue at	AM	24	No
	59th Street	PM	27	No
2.	Atlantic Avenue at	AM	19	No
	South Street	PM	22	No
3.	Linden Avenue at	AM	24	No
	59th Street (north)	PM	27	No
4.	Linden Avenue at	AM	24	No
	59th Street (south)	PM	27	No
5.	Linden Avenue at	AM	20	No
	Hullet Avenue	PM	22	No
6.	Linden Avenue at	AM	20	No
	South Street	PM	22	No

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Cumulative and buildout traffic growth estimates have been calculated using an ambient growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at 0.4% per year. Applied to existing Year 2021 traffic volumes results in a 1.2% increase of growth in existing volumes to near-term horizon Year 2024.

Please note that the recommended ambient growth factor is generally consistent with the background traffic growth estimates contained in the most current *Congestion Management Program for Los Angeles County*. It should be further noted that the 0.4% per year ambient growth factor was approved by City of Long Beach staff, which is consistent with the SCAG model growth projections within the City.

6.2 Cumulative Projects Traffic Characteristics

The City of Long Beach identified thirteen (13) cumulative projects within the Project study area. Cumulative projects, as defined by Section 15355 of the CEQA Guidelines, are "closely related past, present and reasonably foreseeable probable future projects". The Traffic Impact Analysis assumes that all of these cumulative projects will be developed at their proposed size and density and operational when the proposed Project is operational. This is the most conservative, worst-case approach, since the exact timing of each cumulative project is uncertain. In addition, impacts for these cumulative projects would likely be, or have been, subject to mitigation measures and/or reduced in size, which could reduce potential impacts. Under this analysis, however, those mitigation measures and/or reduction are not considered.

With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development. These thirteen (13) cumulative projects have been included as part of the cumulative background setting.

Table 6-1 provides the location and a brief description for each of the thirteen (13) cumulative projects. ***Figure 6-1*** graphically illustrates the location of the cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections.

Table 6-2 presents the development totals and resultant trip generation for the thirteen (13) cumulative projects. As shown in *Table 6-2*, the thirteen (13) cumulative projects are expected to generate a combined total of 10,028 daily trips, 969 AM peak hour trips (700 inbound and 269 outbound) and 1,109 PM peak hour trips (422 inbound and 687 outbound) on a typical weekday.

The AM and PM peak hour traffic volumes associated with the thirteen (13) cumulative projects are presented in ***Figures 6-2*** and ***6-3,*** respectively. The AM and PM peak hour traffic volumes associated with the thirteen (13) cumulative projects with adjustments to account for the "complete streets" improvements are presented in ***Figures 6-4*** and ***6-5****,* respectively.

6.3 Year 2024 Traffic Volumes

Figures 6-6 and ***6-7*** present future AM and PM peak hour near-term cumulative traffic volumes at the six (6) key study intersections for the Year 2024, respectively. Please note that the cumulative traffic volumes represent the accumulation of existing traffic, ambient growth traffic and cumulative projects traffic.

Figures 6-8 and ***6-9*** illustrate Year 2024 forecast AM and PM peak hour traffic volumes with the addition of trips generated by the proposed Project, respectively.

Figures 6-10 and ***6-11*** present future AM and PM peak hour near-term cumulative traffic volumes at the six (6) key study intersections for the Year 2024, respectively, with adjustments to account for the "complete streets" improvements.

Figures 6-12 and ***6-13*** illustrate Year 2024 forecast AM and PM peak hour traffic volumes with the addition of trips generated by the proposed Project, respectively, with adjustments to account for the "complete streets" improvements.

TABLE 6-1

LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[7]

No.	Description	Location/Address	Size
City of Long Beach			
1.	1501-31	6976 Cherry Avenue	115,000 SF Industrial Building
2.	1604-06	6242 Paramount Boulevard	26,400 SF Retail Building
3.	The Uptown	6151 – 6191 Atlantic Avenue	Expansion of an existing retail center to include the demolition of 3,337 SF floor area within one building and construction of four new buildings with a total floor area of 19,688, for a net increase of 16,351 SF.
4.	1803-15	4700 Cherry Avenue	5,300 SF Commercial Building
5.	1905-11	6170 – 6180 Paramount Boulevard	286,358 SF Industrial Building
6.	1908-02	2400 E. Artesia Boulevard	404,592 SF Warehouse and 21,000 SF Office Building
7.	2101-34	5880 Paramount Boulevard	57,120 SF Warehouse Building
8.	1406-12A	4747 Daisy Avenue	131 DU Multi-Family Residential
9.	1707-10	4800 Long Beach Boulevard	20 DU Multi-Family Residential
10.	1707-11	5100 Long Beach Boulevard	38 DU Multi-Family Residential
11.	1905-01	5450 Cherry Avenue	6,000 SF Restaurant Buildings
12.	1905-29	4251 Long Beach Boulevard	8,559 SF Commercial Building
13.	2002-11	5721 Lime Avenue	14 DU Multi-Family Residential

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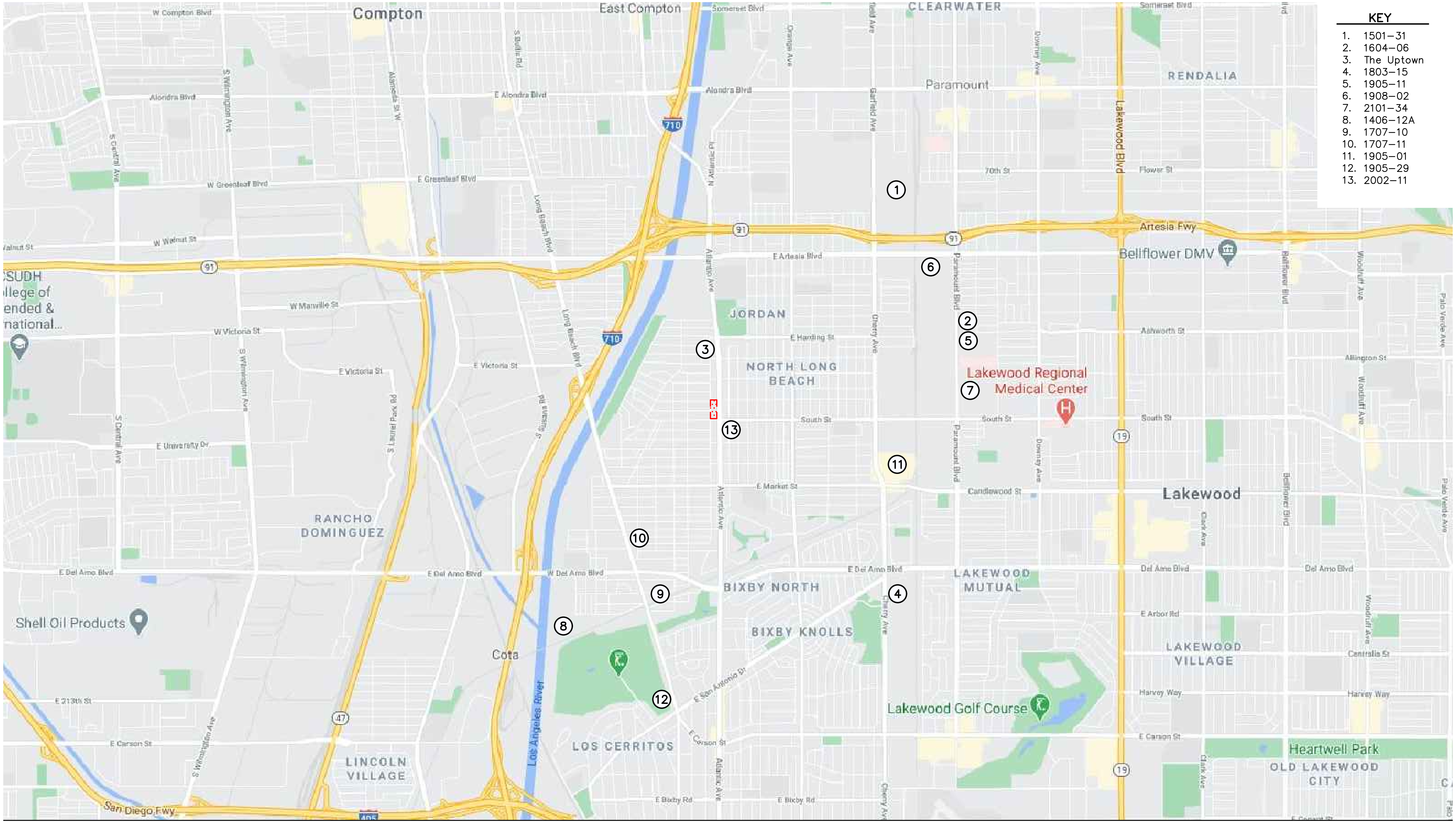
[7] Source: Cities of Long Beach and Signal Hill Planning Departments.



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SOURCE: GOOGLE

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(#) = LOCATION OF CUMULATIVE PROJECT
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FIGURE 6–1

LOCATION OF CUMULATIVE PROJECTS

ATLANTIC RESIDENTIAL, LONG BEACH

TABLE 6-2

CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[8]

No.	Cumulative Project Description	Daily Two-Way	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
1.	1501-31	570	71	10	81	9	63	72
2.	1604-06	897	14	8	22	32	35	67
3.	The Uptown[9]	1,669	67	56	123	51	36	87
4.	1803-15	180	3	1	4	7	6	13
5.	1905-11	1,420	176	24	200	23	157	180
6.	1908-02	2,811	306	70	376	194	316	510
7.	2101-34	99	8	2	10	3	8	11
8.	1406-12A	959	14	46	60	46	27	73
9.	1707-10	146	2	7	9	7	4	11
10.	1707-11	278	4	13	17	13	8	21
11.	1905-01	606	30	24	54	21	13	34
12.	1905-29	291	4	3	7	11	11	22
13.	2002-11	102	1	5	6	5	3	8
	Total Cumulative Projects Tip Generation Forecast	**10,028**	**700**	**269**	**969**	**422**	**687**	**1,109**

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[8] Unless otherwise noted, Source: *Trip Generation, 10th Editions*, Institute of Transportation Engineers (ITE) [Washington, D.C. (2017)].

[9] Source: *The Uptown TIA,* prepared by LLG Engineers in May 2018 (revised September 2018).

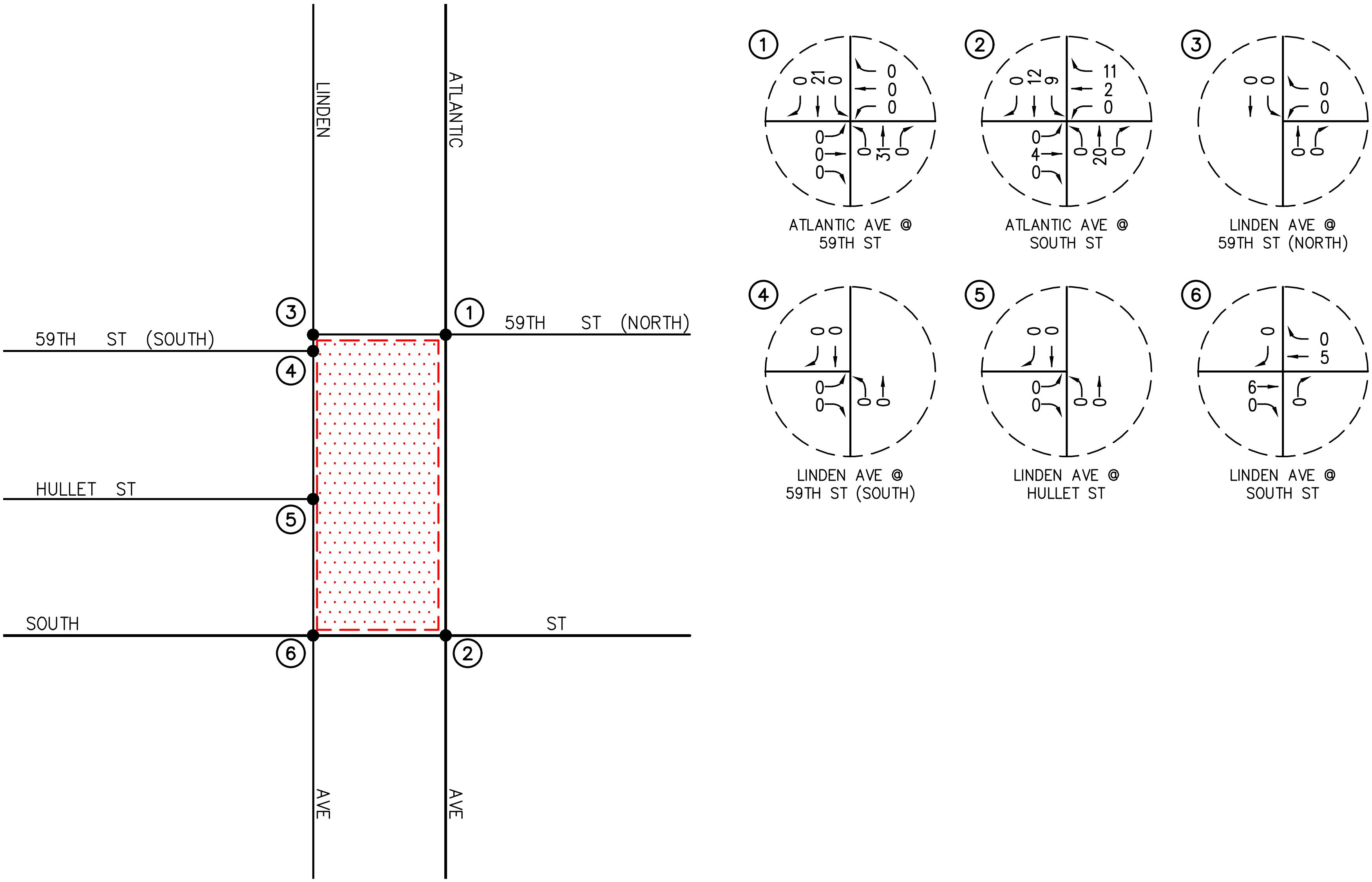

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FIGURE 6-2

AM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES

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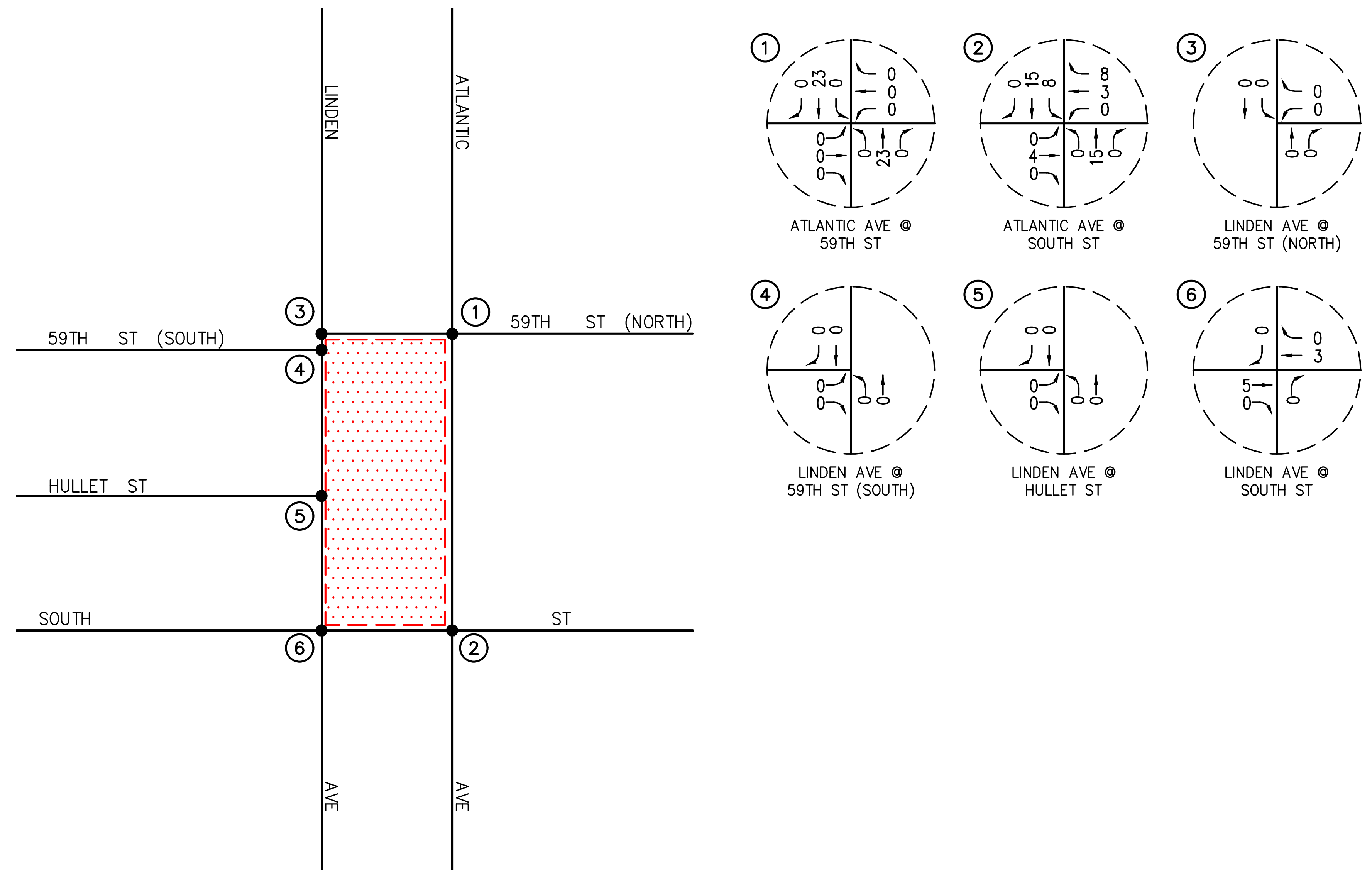

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FIGURE 6–3

PM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES

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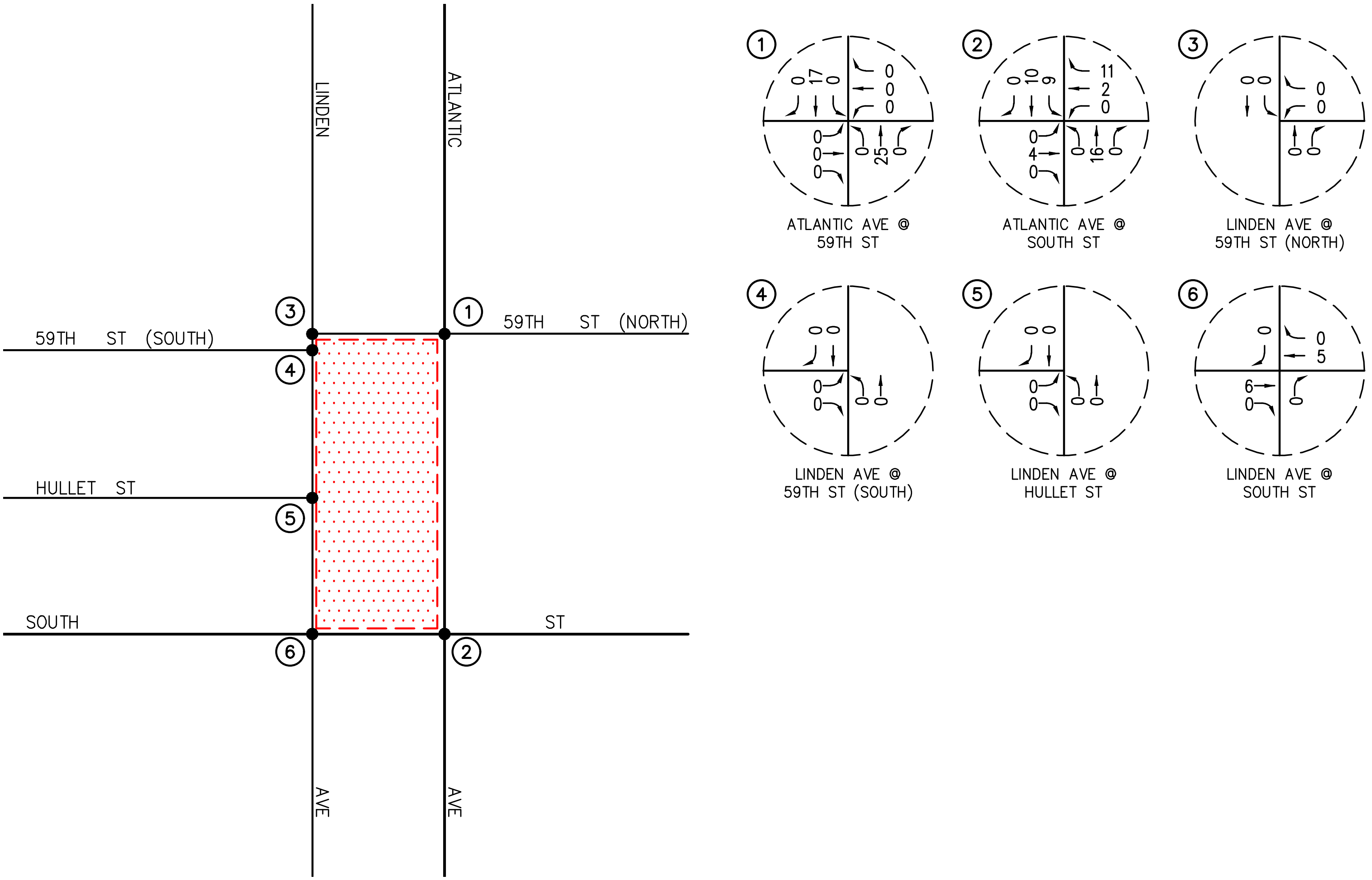

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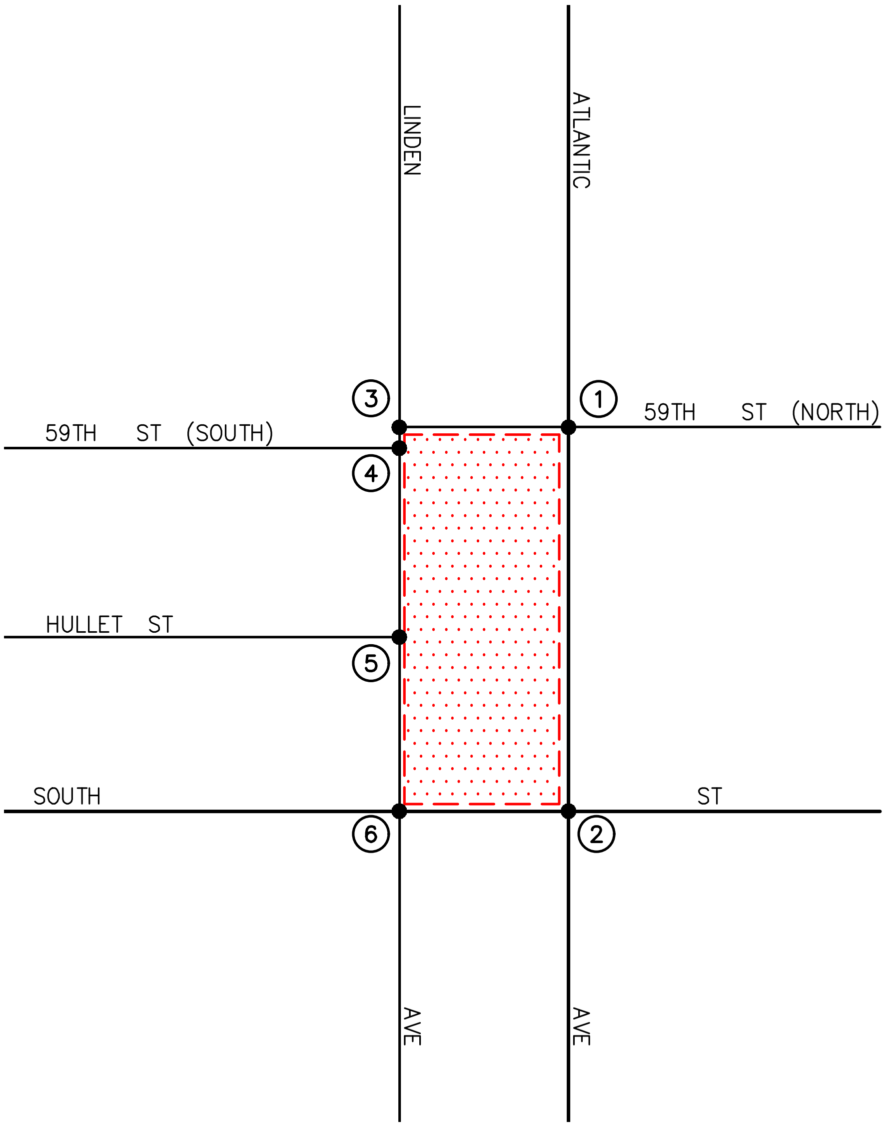
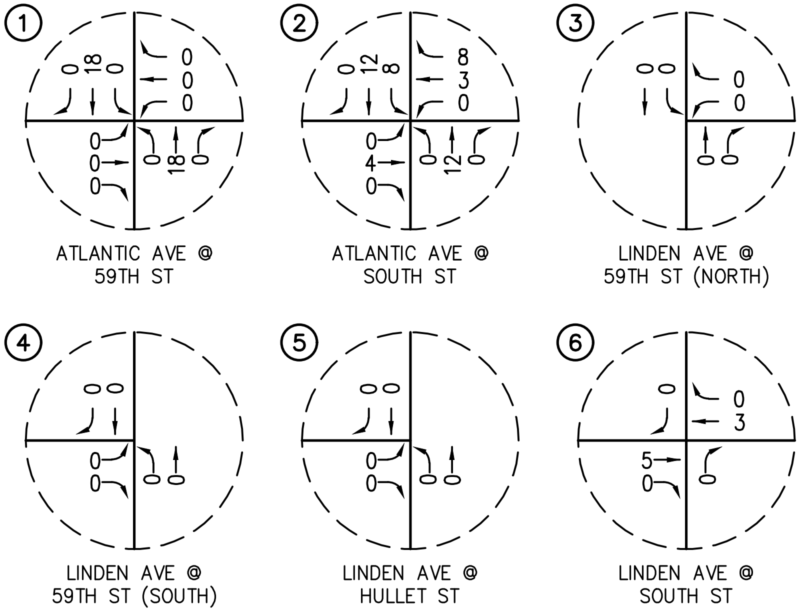
FIGURE 6–4

AM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH





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GREENSPAN
engineers

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NO SCALE

KEY

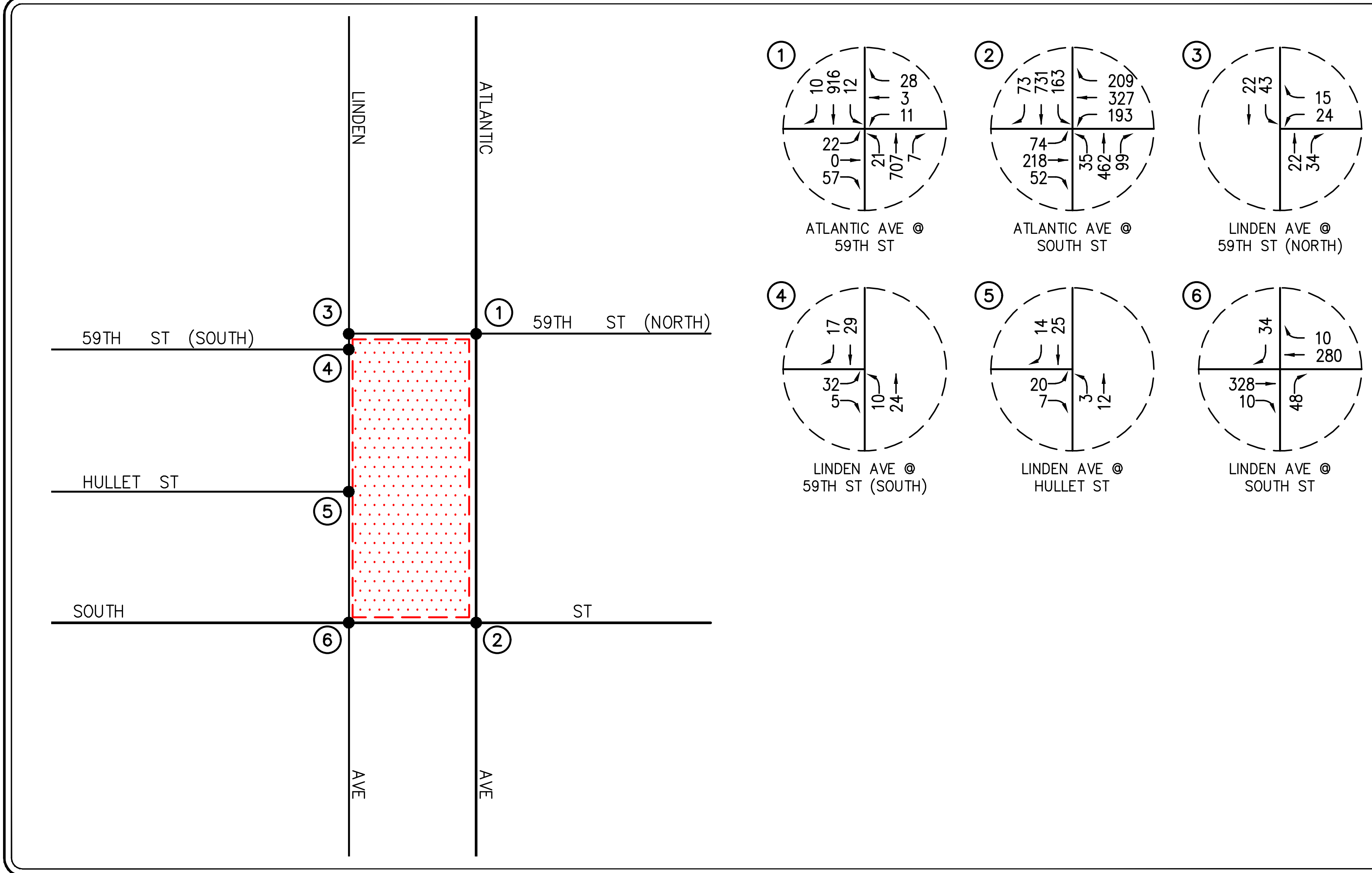
Ⓝ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–5

PM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH



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N
NO SCALE

KEY

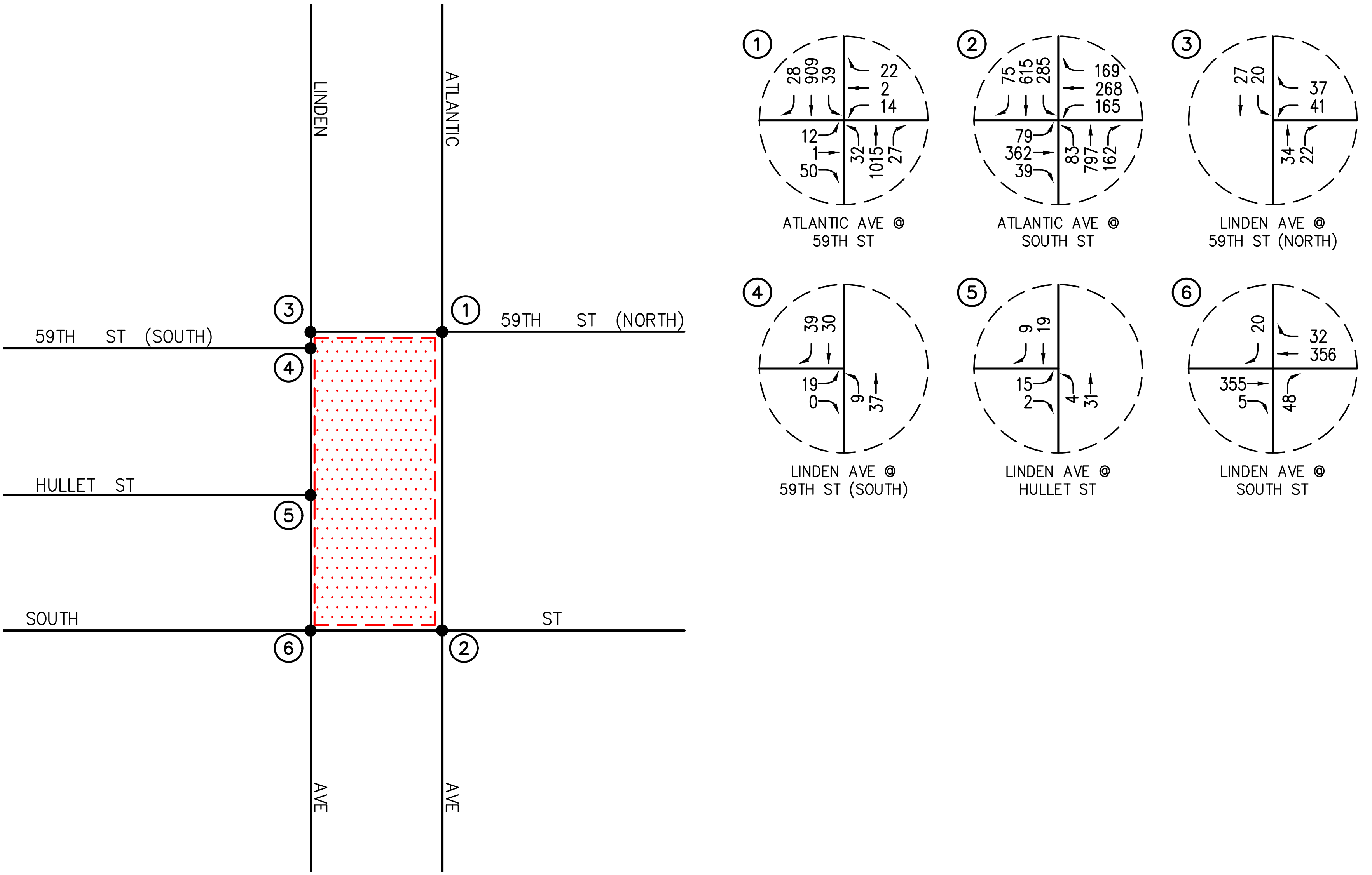
(#) = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–6

YEAR 2024 CUMULATIVE
AM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH



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engineers

NO SCALE

KEY

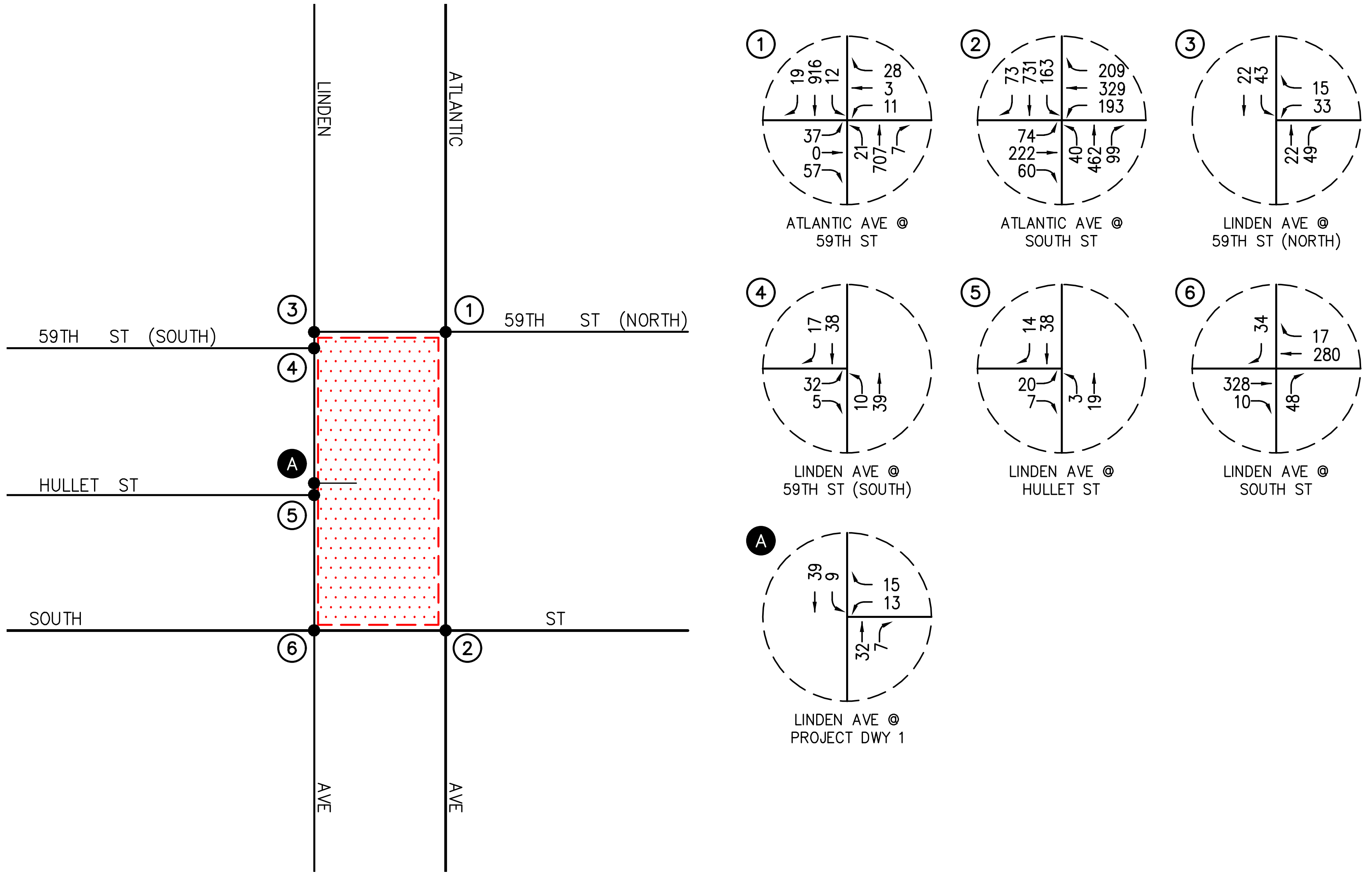
(#) = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–7

YEAR 2024 CUMULATIVE
AM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH



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GREENSPAN
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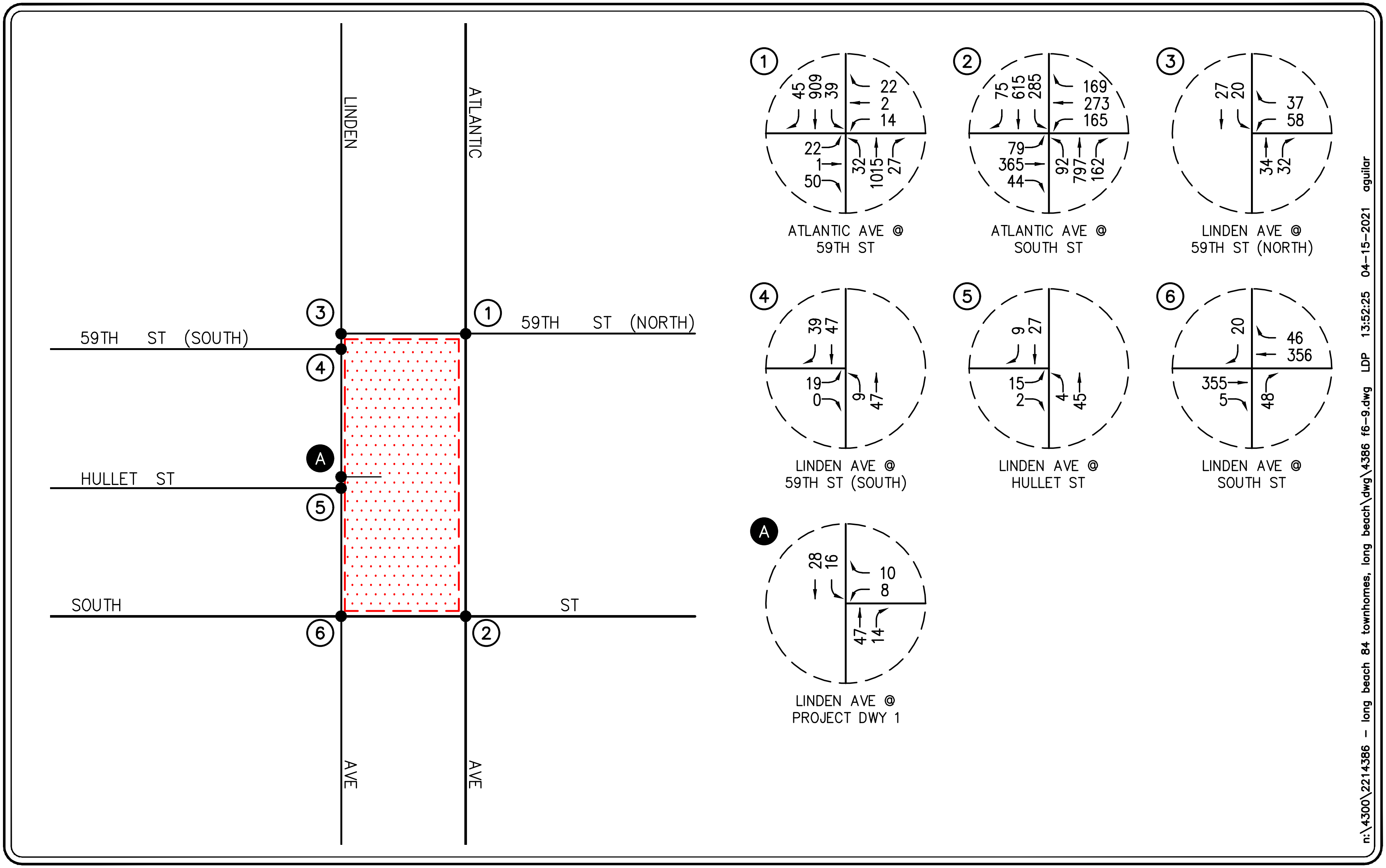
N NO SCALE

KEY
(#) = STUDY INTERSECTION
▨ = PROJECT SITE

FIGURE 6–8

YEAR 2024 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH



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NO SCALE

KEY

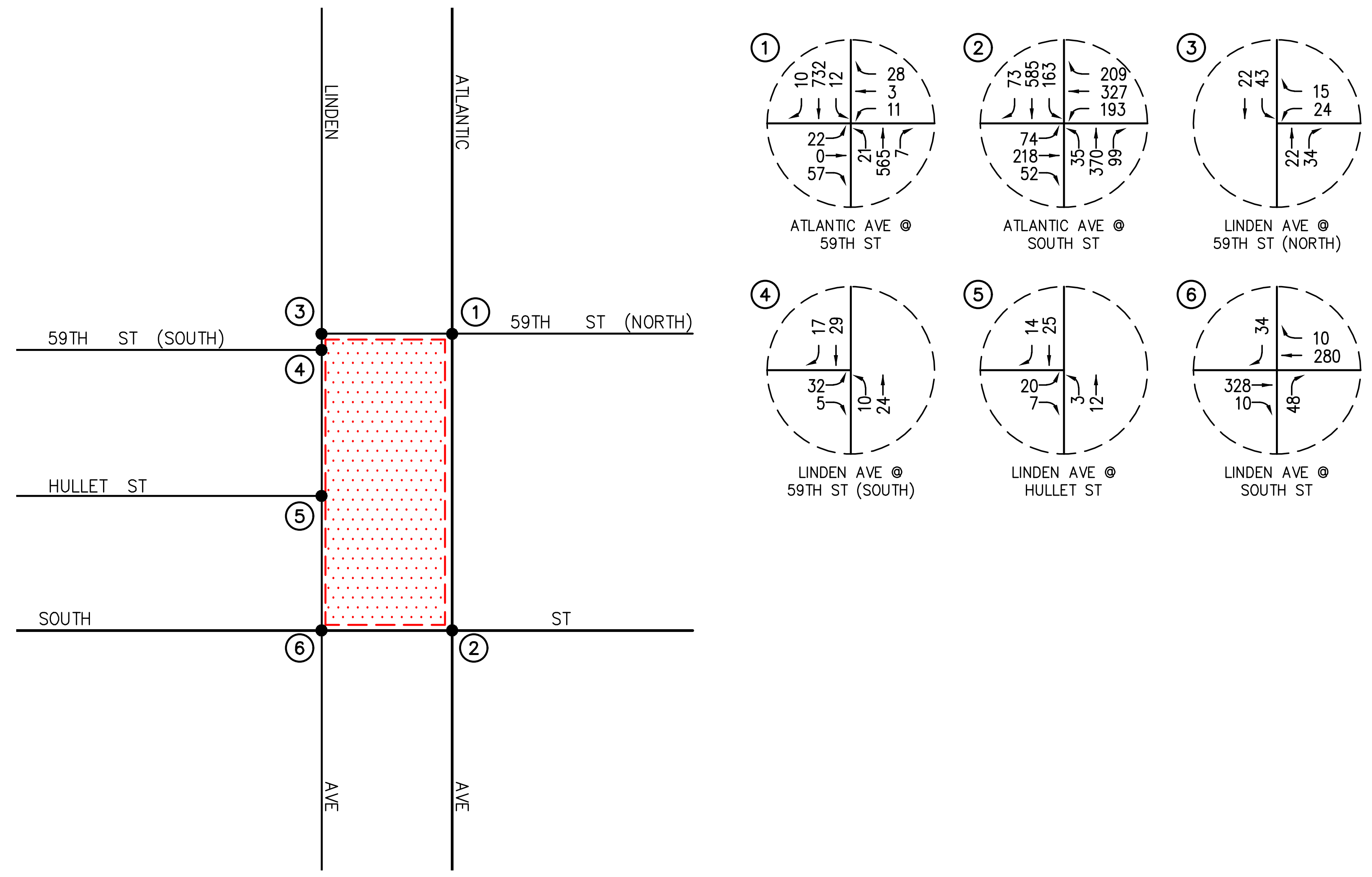
(#) = STUDY INTERSECTION

🟥 = PROJECT SITE

FIGURE 6–9

YEAR 2024 CUMULATIVE PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

ATLANTIC RESIDENTIAL, LONG BEACH



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N NO SCALE

KEY

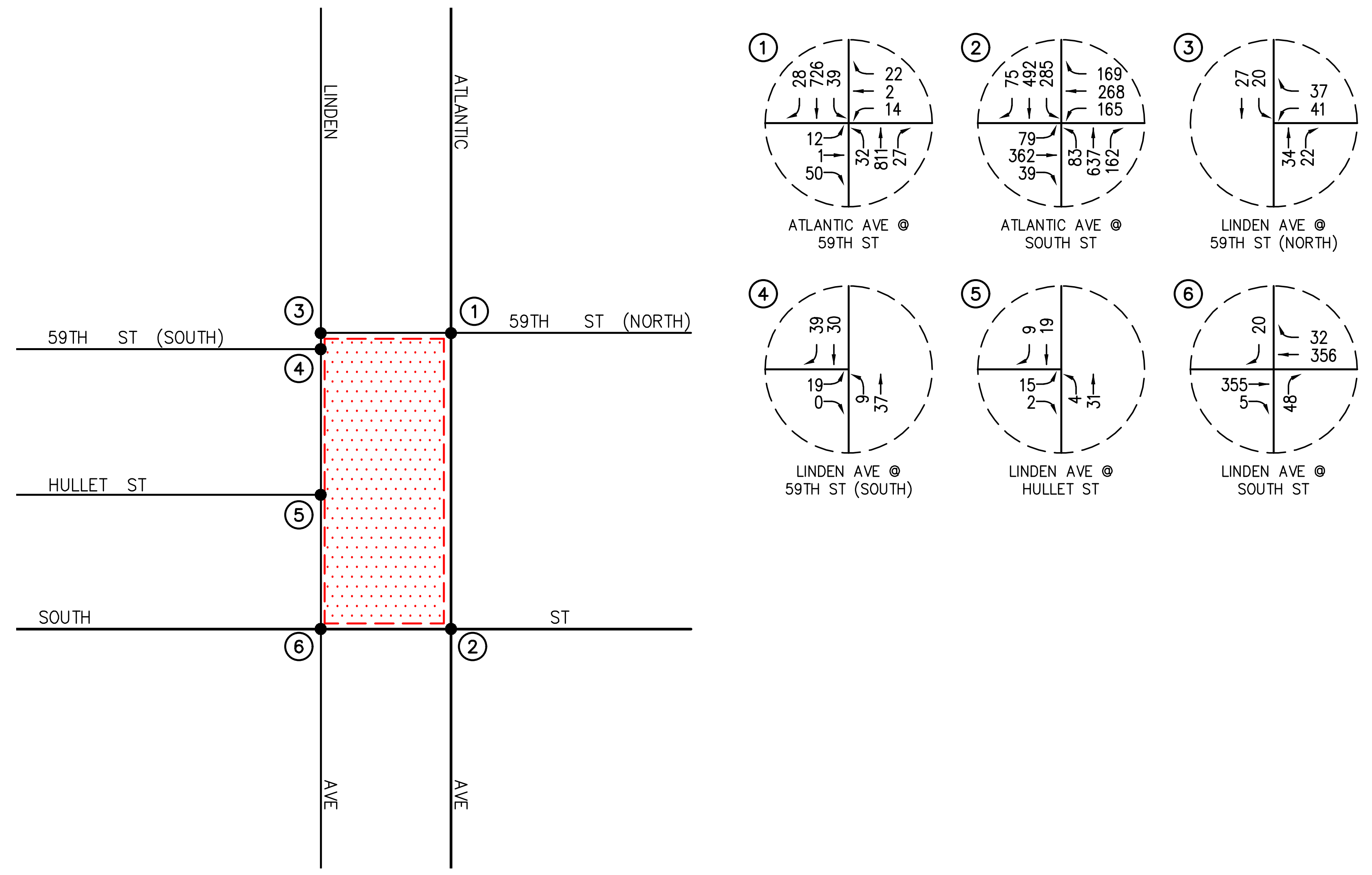
Ⓝ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–10

YEAR 2024 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH



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KEY

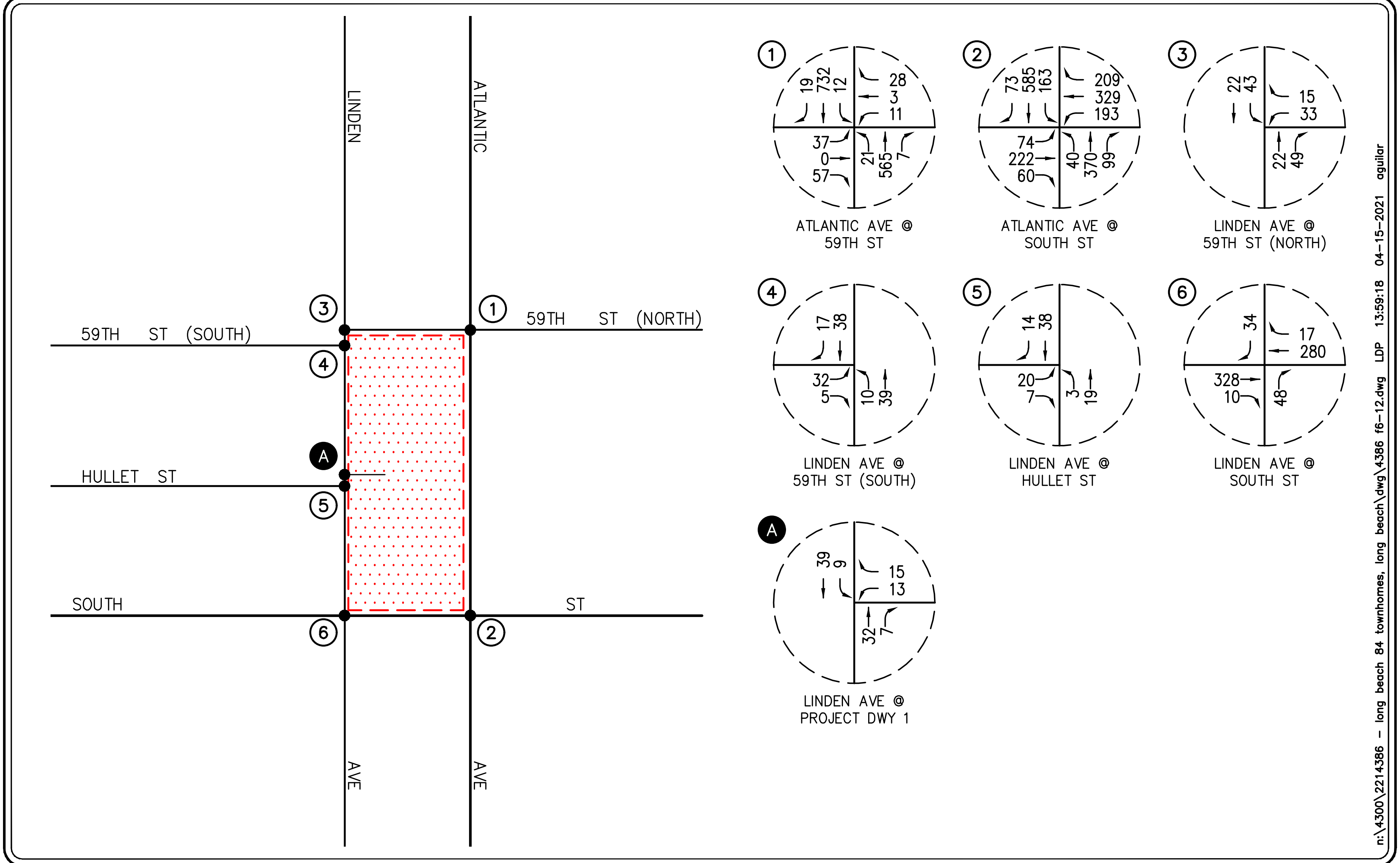
Ⓝ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–11

YEAR 2024 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH



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NO SCALE

KEY

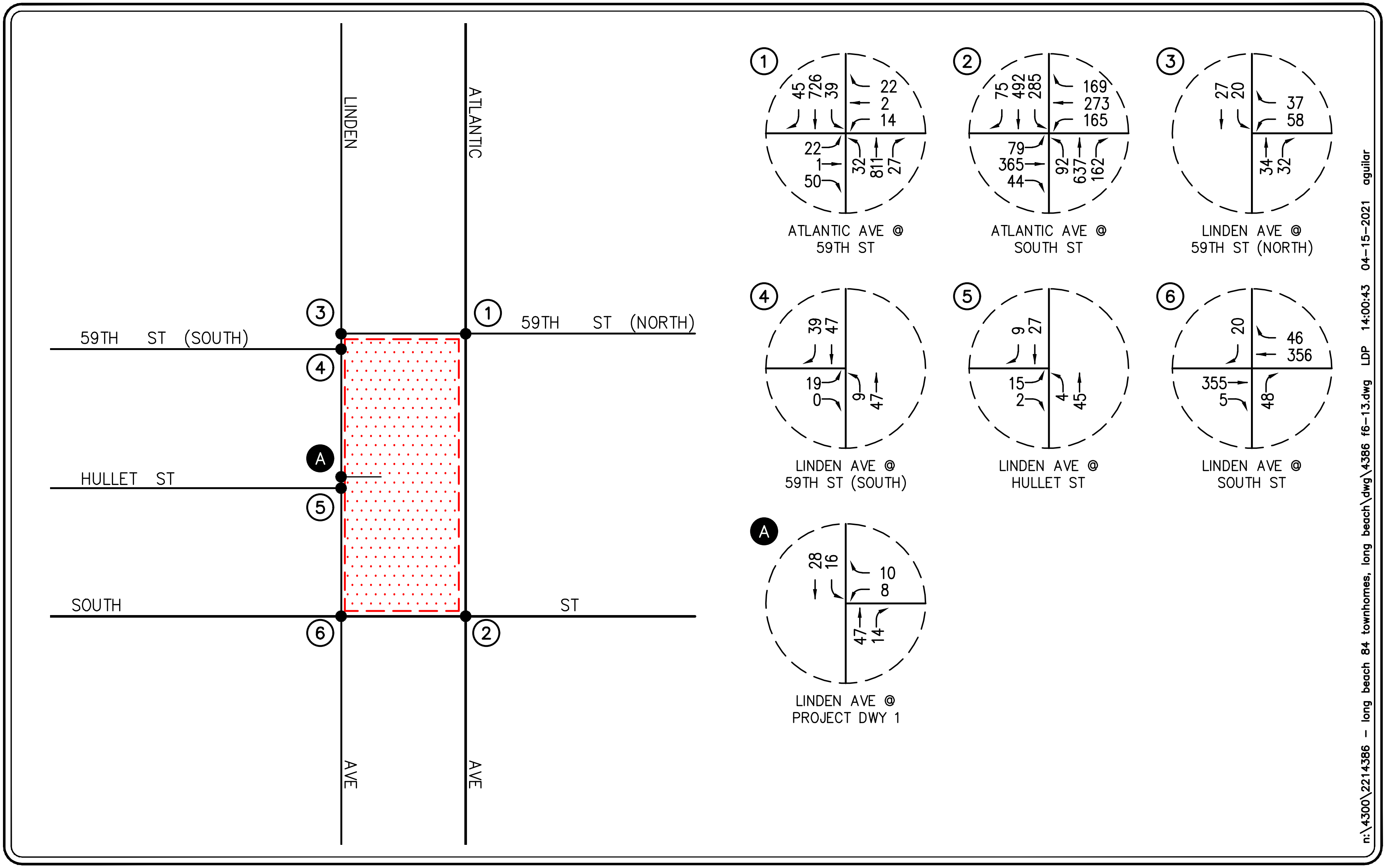
Ⓝ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–12

YEAR 2024 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH



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GREENSPAN
engineers

NO SCALE

KEY

(#) = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 6–13

YEAR 2024 CUMULATIVE PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES WITH "COMPLETE STREETS" IMPROVEMENTS

ATLANTIC RESIDENTIAL, LONG BEACH

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

7.1 LOS Consequences and Thresholds

The potential LOS consequences of the added project traffic volumes generated by the proposed Project during the weekday peak hours was evaluated based on analysis of future operating conditions at the six (6) key study intersections, without, then with, the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The consequence of added project-related peak hour traffic on the LOS at each key intersection was then evaluated using the following criteria.

7.1.1 *City of Long Beach*

According to the City of Long Beach, the City has identified LOS D as the threshold for acceptable operating conditions for intersections. The following criteria was used to determine if the addition of project traffic would be responsible for LOS deficiencies and whether feasible roadway improvements should be identified to improve performance:

Signalized Intersections:

- If, under without project conditions, the intersection operates at LOS D or better and the addition of project trips results in unacceptable LOS (LOS E/F). On occasion, LOS E may be allowed for peak periods in very dense urban conditions (such as in downtown Long Beach) per the City's discretion. The intersections specified in the City of Long Beach General Plan Mobility Element already operating at LOS E/F will be allowed to operate at existing levels; or

- If, under without project conditions, an intersection operates at LOS E or F and the project increases average control delay at the intersection by 2.5 seconds or more.

- If, under project conditions, the 95th percentile queue length exceeds the available storage length at any turn bay.

Unsignalized Intersections:

- If, under project conditions, the intersection operates at an unacceptable LOS (LOS E/F). On occasion, LOS E may be allowed for peak periods in very dense urban conditions (such as in downtown Long Beach) per the City's discretion.

- If the intersection meets the peak-hour traffic signal warrant after the addition of project traffic. If the intersection meets the peak-hour traffic signal warrant, all other applicable warrants must also be assessed.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which intersection capacity calculations have been performed using the HCM methodologies:

A. Existing Traffic Conditions, without and with the “Complete Streets” Improvements;
B. Existing Plus Project Traffic Conditions, without and with the “Complete Streets” Improvements;
C. Scenario (B) with Improvements, if necessary;
D. Year 2024 Cumulative Traffic Conditions, without and with the “Complete Streets” Improvements;
E. Year 2024 Cumulative Plus Project Traffic Conditions, without and with the “Complete Streets” Improvements; and
F. Scenario (E) with Improvements, if necessary.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Existing Plus Project Traffic Conditions

Table 8-1 summarizes the peak hour Level of Service results at the six (6) key study intersections for existing plus project traffic conditions. The first column (1) of HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-3*). The second column (2) lists existing plus project traffic conditions with current intersection geometry/lane configurations. The third column (3) shows the increase in HCM value due to the added peak hour project trips and indicates whether the traffic associated with the Project would result in LOS deficiencies and whether feasible roadway improvements would be necessary to improve intersection performance based on the criteria defined in this report. The fourth column (4) indicates the anticipated level of service with improvements, if any.

8.1.1 *Existing Traffic Conditions*

As previously presented in *Table 3-3*, review of column 1 indicates that all of the key study intersections currently operate at LOS C or better during the weekday AM and PM peak hours.

8.1.2 *Existing Plus Project Traffic Conditions*

Review of columns 2 and 3 of *Table 8-1* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project traffic conditions.

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

8.2 Existing Plus Project Plus Traffic Conditions with "Complete Streets" Improvements

Table 8-2 summarizes the peak hour Level of Service results at the six (6) key study intersections for existing plus project traffic conditions with the inclusion of the "complete streets" improvements along Atlantic Avenue. The first column (1) of HCM/LOS values in *Table 8-2* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists existing plus project traffic conditions. The third column (3) shows the increase in HCM value due to the added peak hour project trips and indicates whether the traffic associated with the Project will exceed LOS thresholds and have an impact based on the criteria defined in this report. The fourth column (4) indicates the anticipated level of service with improvements, if any.

8.2.1 *Existing Traffic Conditions*

As previously presented in *Table 3-4*, review of column 1 indicates that all of the key study intersections are forecast to operate at LOS C or better during the weekday AM and PM peak hours under Existing traffic conditions, with the inclusion of the "complete streets" improvements.

8.2.2 *Existing Plus Project Traffic Conditions*

Review of columns 2 and 3 of *Table 8-2* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project traffic conditions, with the inclusion of the "complete streets" improvements.

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

TABLE 8-1

EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) LOS Deficiencies / Impact Exceeded		(4) Existing Plus Project With Improvements	
		Delay (s/v)	LOS	Delay (s/v)	LOS	Increase (s/v)	Yes/No	Delay (s/v)	LOS
1. Atlantic Avenue at 59th Street	AM	5.1	A	5.6	A	0.5	No	--	--
	PM	4.9	A	5.3	A	0.4	No	--	--
2. Atlantic Avenue at South Street	AM	20.1	C	20.1	C	0.0	No	--	--
	PM	22.5	C	22.7	C	0.2	No	--	--
3. Linden Avenue at 59th Street (north)	AM	7.5	A	7.6	A	0.1	No	--	--
	PM	7.5	A	7.7	A	0.2	No	--	--
4. Linden Avenue at 59th Street (south)	AM	9.4	A	9.6	A	0.2	No	--	--
	PM	9.4	A	9.6	A	0.2	No	--	--
5. Linden Avenue at Hullet Avenue	AM	8.9	A	9.1	A	0.2	No	--	--
	PM	9.1	A	9.3	A	0.2	No	--	--
6. Linden Avenue at South Street	AM	10.9	B	10.9	B	0.0	No	--	--
	PM	11.3	B	11.3	B	0.0	No	--	--

Notes:

- **Bold** LOS values indicate adverse service levels based on City LOS standards
- s/v = seconds per vehicle (delay)

TABLE 8-2

EXISTING PLUS PROJECT WITH "COMPLETE STREETS" IMPROVEMENTS

PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) LOS Deficiencies / Impact Exceeded		(4) Existing Plus Project With Improvements	
			Delay (s/v)	LOS	Delay (s/v)	LOS	Increase (s/v)	Yes/No	Delay (s/v)	LOS
1.	Atlantic Avenue at	AM	6.8	A	7.5	A	0.7	No	--	--
	59th Street	PM	6.7	A	7.3	A	0.6	No	--	--
2.	Atlantic Avenue at	AM	23.0	C	23.3	C	0.3	No	--	--
	South Street	PM	23.9	C	24.0	C	0.1	No	--	--
3.	Linden Avenue at	AM	7.5	A	7.6	A	0.1	No	--	--
	59th Street (north)	PM	7.5	A	7.7	A	0.2	No	--	--
4.	Linden Avenue at	AM	9.4	A	9.6	A	0.2	No	--	--
	59th Street (south)	PM	9.4	A	9.6	A	0.2	No	--	--
5.	Linden Avenue at	AM	8.9	A	9.1	A	0.2	No	--	--
	Hullet Avenue	PM	9.1	A	9.3	A	0.2	No	--	--
6.	Linden Avenue at	AM	10.9	B	10.9	B	0.0	No	--	--
	South Street	PM	11.3	B	11.3	B	0.0	No	--	--

Notes:

- **Bold** LOS values indicate adverse service levels based on City LOS standards
- s/v = seconds per vehicle (delay)

8.3 Year 2024 Traffic Conditions

Table 8-3 summarizes the peak hour Level of Service results at the six (6) key study intersections for the Year 2024 opening year. The first column (1) of HCM/LOS values in *Table 8-3* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Tables 3-3* and *8-1*). The second column (2) lists future Year 2024 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic), without any traffic generated by the proposed Project. The third column (3) presents future forecast traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in HCM value due to the added peak hour project trips and indicates whether the traffic associated with the Project would result in LOS deficiencies and whether feasible roadway improvements would be necessary to improve intersection performance based on the criteria defined in this report. The fifth column (5) indicates the anticipated level of service with improvements, if any.

8.3.1 *Year 2024 Cumulative Traffic Conditions*

Review of column 2 of *Table 8-3* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative traffic conditions.

8.3.2 *Year 2024 Cumulative Plus Project Traffic Conditions*

Review of columns 3 and 4 of *Table 8-3* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Year 2024 Cumulative Plus Project traffic conditions.

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

8.4 Year 2024 Traffic Conditions with "Complete Streets" Improvements

Table 8-4 summarizes the peak hour Level of Service results at the six (6) key study intersections for the Year 2024 opening year with the inclusion of the "complete streets" improvements along Atlantic Avenue. The first column (1) of HCM/LOS values in *Table 8-4* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Tables 3-4* and *8-2*). The second column (2) lists future Year 2024 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic), without any traffic generated by the proposed Project. The third column (3) presents future forecast traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in HCM value due to the added peak hour project trips and indicates whether the traffic associated with the Project will have an impact based on the LOS standards and criteria defined in this report. The fifth column (5) indicates the anticipated level of service with improvements, if any.

8.4.1 *Year 2024 Cumulative Traffic Conditions*

Review of column 2 of *Table 8-4* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under 2024 Cumulative traffic conditions, with the inclusion of the "complete streets" improvements.

8.4.2 *Year 2024 Cumulative Plus Project Plus Road Diet Traffic Conditions*

Review of columns 3 and 4 of *Table 8-4* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under 2024 Cumulative Plus Project traffic conditions, with the inclusion of the "complete streets" improvements.

Appendix C contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report.

TABLE 8-3

YEAR 2024 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2024 Cumulative Traffic Conditions		(3) Year 2024 Cumulative Plus Project Traffic Conditions		(4) LOS Deficiencies / Impact Exceeded		(5) Year 2024 Cumulative Plus Project With Improvements	
			Delay (s/v)	**LOS**	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**	**Increase (s/v)**	**Yes/No**	**Delay (s/v)**	**LOS**
1.	Atlantic Avenue at	AM	5.1	A	5.0	A	5.5	A	0.5	No	--	--
	59th Street	PM	4.9	A	4.9	A	5.3	A	0.4	No	--	--
2.	Atlantic Avenue at	AM	20.1	C	20.2	C	20.5	C	0.3	No	--	--
	South Street	PM	22.5	C	23.3	C	23.5	C	0.2	No	--	--
3.	Linden Avenue at	AM	7.5	A	7.5	A	7.6	A	0.1	No	--	--
	59th Street (north)	PM	7.5	A	7.5	A	7.7	A	0.2	No	--	--
4.	Linden Avenue at	AM	9.4	A	9.4	A	9.6	A	0.2	No	--	--
	59th Street (south)	PM	9.4	A	9.4	A	9.6	A	0.2	No	--	--
5.	Linden Avenue at	AM	8.9	A	8.9	A	9.1	A	0.2	No	--	--
	Hullet Avenue	PM	9.1	A	9.1	A	9.3	A	0.2	No	--	--
6.	Linden Avenue at	AM	10.9	B	11.0	B	11.0	B	0.0	No	--	--
	South Street	PM	11.3	B	11.4	B	11.4	B	0.0	No	--	--

Notes:

- **Bold** LOS values indicate adverse service levels based on City LOS standards
- s/v = seconds per vehicle (delay)

TABLE 8-4

YEAR 2024 CUMULATIVE WITH "COMPLETE STREETS" IMPROVEMENTS

PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections		**Time Period**	**(1) Existing Traffic Conditions**		**(2) Year 2024 Cumulative Traffic Conditions**		**(3) Year 2024 Cumulative Plus Project Traffic Conditions**		**(4) LOS Deficiencies / Impact Exceeded**		**(5) Year 2024 Cumulative Plus Project With Improvements**	
			Delay (s/v)	**LOS**	**Delay (s/v)**	**LOS**	**Delay (s/v)**	**LOS**	**Increase (s/v)**	**Yes/No**	**Delay (s/v)**	**LOS**
1.	Atlantic Avenue at	AM	6.8	A	6.8	A	7.5	A	0.7	No	--	--
	59th Street	PM	6.7	A	6.8	A	7.4	A	0.6	No	--	--
2.	Atlantic Avenue at	AM	23.0	C	23.5	C	23.6	C	0.1	No	--	--
	South Street	PM	23.9	C	24.7	C	24.7	C	0.0	No	--	--
3.	Linden Avenue at	AM	7.5	A	7.5	A	7.6	A	0.1	No	--	--
	59th Street (north)	PM	7.5	A	7.5	A	7.7	A	0.2	No	--	--
4.	Linden Avenue at	AM	9.4	A	9.4	A	9.6	A	0.2	No	--	--
	59th Street (south)	PM	9.4	A	9.4	A	9.6	A	0.2	No	--	--
5.	Linden Avenue at	AM	8.9	A	8.9	A	9.1	A	0.2	No	--	--
	Hullet Avenue	PM	9.1	A	9.1	A	9.3	A	0.2	No	--	--
6.	Linden Avenue at	AM	10.9	B	11.0	B	11.0	B	0.0	No	--	--
	South Street	PM	11.3	B	11.4	B	11.4	B	0.0	No	--	--

Notes:

- **Bold** LOS values indicate adverse service levels based on City LOS standards
- s/v = seconds per vehicle (delay)

9.0 INTERSECTION VEHICLE QUEUEING ANALYSES

A vehicle queueing analysis was conducted at each signalized study intersection in addition to the intersection level of service analyses. The queueing analysis was prepared for each intersection lane group and was based on the 95th percentile queues utilizing HCM methodology for signalized intersections.

The queuing analysis was based on the forecast weekday AM and PM intersection turning movement volumes utilized in the level of service analyses. The existing lane configurations and storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and on field reviews conducted by LLG Engineers. An average vehicle length of 25 feet is assumed for purposes of this analysis.

9.1 Existing Traffic Conditions

Table 9-1 presents the queueing analyses results for the two (2) signalized study intersections. Column 1 presents the queuing results for Existing traffic conditions. Column 2 presents the results for Existing Plus Project traffic conditions.

9.1.1 *Existing Traffic Conditions*

Review of Column 1 of *Table 9-1* indicates that one (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Existing traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

9.1.2 *Existing Plus Project Traffic Conditions*

Review of Column 2 of *Table 9-1* indicates that same one (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach with the addition of project traffic. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Appendix C presents the queuing information for the signalized study intersections.

9.2 Existing Traffic Conditions with "Complete Streets" Improvements

Table 9-2 presents the queueing analyses results for the two (2) signalized study intersections with the inclusion of the "complete streets" improvements along Atlantic Avenue. Column 1 presents the queuing results for Existing traffic conditions. Column 2 presents the results for Existing Plus Project traffic conditions.

9.2.1 *Existing Traffic Conditions*

Review of Column 1 of *Table 9-2* indicates that one (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach under Existing traffic conditions, with the inclusion of the "complete streets" improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

9.2.2 *Existing Plus Project Traffic Conditions*

Review of Column 2 of *Table 9-2* indicates that same one (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach with the addition of project traffic, with the inclusion of the "complete streets" improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Appendix C presents the queuing information for the signalized study intersections.

9.3 Year 2024 Cumulative Traffic Conditions

Table 9-3 presents the queueing analyses results for the two (2) signalized study intersections. Column 1 presents the queuing results for Year 2024 cumulative traffic conditions. Column 2 presents the results for Year 2024 Cumulative Plus Project traffic conditions.

9.3.1 *Year 2024 Cumulative Traffic Conditions*

Review of Column 1 of *Table 9-3* indicates that one (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach under Year 2024 Cumulative traffic conditions. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

9.3.2 *Year 2024 Cumulative Plus Project Traffic Conditions*

Review of Column 2 of *Table 9-3* indicates that same one (1) key study intersection has queues which exceed the existing storage capacity for one intersection approach with the addition of project traffic. The remaining key study intersection has queues that are adequately accommodated by the existing storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Appendix C presents the queuing information for the signalized study intersections.

9.4 Year 2024 Cumulative Traffic Conditions with "Complete Streets" Improvements

Table 9-4 presents the queueing analyses results for the two (2) signalized study intersections with the inclusion of the "complete streets" improvements along Atlantic Avenue. Column 1 presents the queuing results for Year 2024 Cumulative traffic conditions. Column 2 presents the results for Year 2024 Cumulative Plus Project traffic conditions.

9.4.1 *Year 2024 Cumulative Traffic Conditions*

Review of Column 1 of *Table 9-4* indicates that one (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach under Year 2024 Cumulative traffic conditions, with the inclusion of the “complete streets” improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hours

9.4.2 *Year 2024 Cumulative Plus Project Traffic Conditions*

Review of Column 2 of *Table 9-4* indicates that same one (1) key study intersection has queues which exceed the proposed storage capacity for one intersection approach with the addition of project traffic, with the inclusion of the “complete streets” improvements. The remaining key study intersection has queues that are adequately accommodated by the proposed storage space. The intersection/approach with storage deficiencies include the following:

- Intersection No. 2: Atlantic Avenue at South Street
    - Westbound left-turn – AM and PM peak hour

The addition of project traffic does not contribute to the westbound left-turn movement at the intersection of Atlantic Avenue/South Street. Therefore, it is not considered a significant impact. In addition, it should be noted that the City of Long Beach determines study intersections based on a 50 peak hour trips threshold. As such, Atlantic Avenue at South Street would not be required for analysis based on the City of Long Beach guidelines.

Appendix C presents the queuing information for the signalized study intersections.

TABLE 9-1

EXISTING PLUS PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS[10]

Key Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Atlantic Avenue at 59th Street									
Northbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Northbound Through	585’	32’	Yes	48’	Yes	40’	Yes	58’	Yes
Northbound Through/Right	585’	32’	Yes	48’	Yes	40’	Yes	57’	Yes
Southbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Southbound Through	600’	48’	Yes	40’	Yes	61’	Yes	49’	Yes
Southbound Through/Right	600’	48’	Yes	39’	Yes	61’	Yes	48’	Yes
Eastbound Left/Through/Right	230’	103’	Yes	98’	Yes	122’	Yes	113’	Yes
Westbound Left/Through/Right	230’	54’	Yes	69’	Yes	53’	Yes	67’	Yes
2. Atlantic Avenue at South Street									
Northbound Left-Turn	120’	31’	Yes	78’	Yes	36’	Yes	89’	Yes
Northbound Through	635’	184’	Yes	375’	Yes	187’	Yes	380’	Yes
Northbound Through/Right	635’	175’	Yes	359’	Yes	177’	Yes	363’	Yes
Southbound Left-Turn	185’[11]	88’	Yes	164’	Yes	90’	Yes	165’	Yes
Southbound Through	580’	216’	Yes	144’	Yes	219’	Yes	145’	Yes
Southbound Right-Turn	45’	37’	Yes	32’	Yes	38’	Yes	32’	Yes

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

[11] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-1 (CONTINUED)

EXISTING PLUS PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS[12]

		(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Key Intersection	**Storage Provided (feet)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**
2. Atlantic Avenue at South Street (Continued)									
Eastbound Left-Turn	125’[13]	85’	Yes	81’	Yes	84’	Yes	80’	Yes
Eastbound Through	1,410’	116’	Yes	172’	Yes	121’	Yes	175’	Yes
Eastbound Through/Right	1,410’	112’	Yes	167’	Yes	116’	Yes	170’	Yes
Westbound Left-Turn	115’[13]	**232’**	**No**	**194’**	**No**	**232’**	**No**	**194’**	**No**
Westbound Through	2,240’	267’	Yes	203’	Yes	266’	Yes	204’	Yes
Westbound Through/Right	2,240’	241’	Yes	184’	Yes	240’	Yes	186’	Yes

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

[13] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-2

EXISTING PLUS PROJECT WITH "COMPLETE STREETS" IMPROVEMENTS PEAK HOUR INTERSECTION QUEUING ANALYSIS[14]

		(1) Existing Traffic Conditions				**(2) Existing Plus Project Traffic Conditions**			
		AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Key Intersection	**Storage Provided (feet)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**
1. Atlantic Avenue at 59th Street									
Northbound Left-Turn	60'	25'	Yes	25'	Yes	25'	Yes	25'	Yes
Northbound Through/Right	585'	65'	Yes	112'	Yes	80'	Yes	134'	Yes
Southbound Left-Turn	60'	25'	Yes	25'	Yes	25'	Yes	25'	Yes
Southbound Through/Right	600'	109'	Yes	86'	Yes	138'	Yes	107'	Yes
Eastbound Left/Through/Right	230'	109'	Yes	103'	Yes	129'	Yes	119'	Yes
Westbound Left/Through/Right	230'	57'	Yes	72'	Yes	56'	Yes	71'	Yes
2. Atlantic Avenue at South Street									
Northbound Left-Turn	120'	38'	Yes	77'	Yes	45'	Yes	86'	Yes
Northbound Through	635'	238'	Yes	465'	Yes	246'	Yes	465'	Yes
Northbound Right	120'	61'	Yes	102'	Yes	63'	Yes	102'	Yes
Southbound Left-Turn	200'[15]	90'	Yes	160'	Yes	91'	Yes	160'	Yes
Southbound Through	580'	392'	Yes	240'	Yes	397'	Yes	240'	Yes
Southbound Right-Turn	45'	38'	Yes	31'	Yes	39'	Yes	31'	Yes

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

[15] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-2 (CONTINUED)
EXISTING PLUS PROJECT WITH "COMPLETE STREETS" IMPROVEMENTS PEAK HOUR INTERSECTION QUEUING ANALYSIS[16]

		(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Key Intersection	**Storage Provided (feet)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**
2. Atlantic Avenue at South Street (Continued)									
Eastbound Left-Turn	125'[17]	91'	Yes	89'	Yes	90'	Yes	90'	Yes
Eastbound Through	1,410'	124'	Yes	190'	Yes	130'	Yes	194'	Yes
Eastbound Through/Right	1,410'	119'	Yes	186'	Yes	124'	Yes	190'	Yes
Westbound Left-Turn	115'[17]	**245'**	**No**	**219'**	**No**	**247'**	**No**	**221'**	**No**
Westbound Through	2,240'	282'	Yes	220'	Yes	281'	Yes	222'	Yes
Westbound Through/Right	2,240'	254'	Yes	201'	Yes	253'	Yes	204'	Yes

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

[17] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-3

YEAR 2024 CUMULATIVE PEAK HOUR INTERSECTION QUEUING ANALYSIS[18]

Key Intersection	Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Atlantic Avenue at 59th Street									
Northbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Northbound Through	585’	35’	Yes	52’	Yes	43’	Yes	62’	Yes
Northbound Through/Right	585’	35’	Yes	52’	Yes	42’	Yes	62’	Yes
Southbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Southbound Through	600’	52’	Yes	43’	Yes	65’	Yes	52’	Yes
Southbound Through/Right	600’	52’	Yes	42’	Yes	65’	Yes	52’	Yes
Eastbound Left/Through/Right	230’	104’	Yes	100’	Yes	123’	Yes	115’	Yes
Westbound Left/Through/Right	230’	54’	Yes	68’	Yes	53’	Yes	67’	Yes
2. Atlantic Avenue at South Street									
Northbound Left-Turn	120’	32’	Yes	82’	Yes	38’	Yes	93’	Yes
Northbound Through	635’	195’	Yes	396’	Yes	202’	Yes	399’	Yes
Northbound Through/Right	635’	187’	Yes	380’	Yes	194’	Yes	383’	Yes
Southbound Left-Turn	185’[19]	97’	Yes	174’	Yes	98’	Yes	176’	Yes
Southbound Through	580’	225’	Yes	151’	Yes	227’	Yes	152’	Yes
Southbound Right-Turn	45’	38’	Yes	33’	Yes	39’	Yes	33’	Yes

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

[19] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-3 (CONTINUED)

YEAR 2024 CUMULATIVE PEAK HOUR INTERSECTION QUEUING ANALYSIS[20]

Key Intersection	Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
2. Atlantic Avenue at South Street (Continued)									
Eastbound Left-Turn	125’[21]	87’	Yes	82’	Yes	86’	Yes	82’	Yes
Eastbound Through	1,410’	119’	Yes	175’	Yes	124’	Yes	179’	Yes
Eastbound Through/Right	1,410’	115’	Yes	171’	Yes	119’	Yes	174’	Yes
Westbound Left-Turn	115’[21]	**234’**	**No**	**198’**	**No**	**235’**	**No**	**199’**	**No**
Westbound Through	2,240’	276’	Yes	210’	Yes	275’	Yes	211’	Yes
Westbound Through/Right	2,240’	248’	Yes	191’	Yes	247’	Yes	193’	Yes

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

[21] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-4

YEAR 2024 CUMULATIVE WITH “COMPLETE STREETS” IMPROVEMENTS PEAK HOUR INTERSECTION QUEUING ANALYSIS[22]

Key Intersection	Storage Provided (feet)	(1) Year 2024 Cumulative Traffic Conditions				(2) Year 2024 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Atlantic Avenue at 59th Street									
Northbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Northbound Through/Right	585’	72’	Yes	122’	Yes	89’	Yes	146’	Yes
Southbound Left-Turn	60’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Southbound Through/Right	600’	118’	Yes	93’	Yes	149’	Yes	117’	Yes
Eastbound Left/Through/Right	230’	110’	Yes	105’	Yes	130’	Yes	122’	Yes
Westbound Left/Through/Right	230’	57’	Yes	72’	Yes	56’	Yes	71’	Yes
2. Atlantic Avenue at South Street									
Northbound Left-Turn	120’	40’	Yes	81’	Yes	47’	Yes	89’	Yes
Northbound Through	635’	262’	Yes	497’	Yes	266’	Yes	485’	Yes
Northbound Right	120’	64’	Yes	106’	Yes	65’	Yes	103’	Yes
Southbound Left-Turn	200’[23]	99’	Yes	183’	Yes	100’	Yes	175’	Yes
Southbound Through	580’	413’	Yes	257’	Yes	420’	Yes	250’	Yes
Southbound Right-Turn	45’	39’	Yes	32’	Yes	40’	Yes	31’	Yes

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

[23] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

TABLE 9-4 (CONTINUED)

YEAR 2024 CUMULATIVE WITH "COMPLETE STREETS" IMPROVEMENTS PEAK HOUR INTERSECTION QUEUING ANALYSIS[24]

		(1) Year 2024 Cumulative Traffic Conditions				**(2) Year 2024 Cumulative Plus Project Traffic Conditions**			
		AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Key Intersection	**Storage Provided (feet)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**	**Max. Queue/ Min. Storage Required**	**Adequate Storage (Yes/No)**
2. Atlantic Avenue at South Street (Continued)									
Eastbound Left-Turn	125'[25]	93'	Yes	90'	Yes	92'	Yes	92'	Yes
Eastbound Through	1,410'	127'	Yes	191'	Yes	132'	Yes	197'	Yes
Eastbound Through/Right	1,410'	122'	Yes	187'	Yes	127'	Yes	193'	Yes
Westbound Left-Turn	115'[25]	**249'**	**No**	**218'**	**No**	**248'**	**No**	**227'**	**No**
Westbound Through	2,240'	291'	Yes	225'	Yes	289'	Yes	230'	Yes
Westbound Through/Right	2,240'	261'	Yes	205'	Yes	260'	Yes	210'	Yes

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

[25] Storage capacity includes the striped turn pocket as well as the storage space upstream of the turn lane.

10.0 AREA-WIDE TRAFFIC IMPROVEMENTS

10.1 Recommended Improvements

For those intersections where projected traffic volumes are expected to result in poor operating conditions, this report identifies roadway improvements that are expected to:

- Accommodate the LOS deficiencies that would result from added Project traffic and future non-project (ambient growth and cumulative project) traffic in combination with existing traffic; and/or
- Improve Levels of Service to an acceptable range and/or to pre-project conditions.

10.1.1 *Existing Plus Project Traffic Conditions*

The results of the intersection capacity and queueing analyses presented previously in *Tables 8-1 and 9-1* indicates that the proposed Project will not impact any of the six (6) key study intersections under the "Existing Plus Project" traffic scenario. Therefore, no improvements are recommended.

10.1.2 *Existing Plus Project Traffic Conditions with "Complete Streets" Improvements*

The results of the intersection capacity and queueing analyses presented previously in *Tables 8-2 and 9-2* indicates that the proposed Project will not impact any of the six (6) key study intersections under the "Existing Plus Project" traffic scenario with the inclusion of the "complete streets" improvements along Atlantic Avenue. Therefore, no improvements are recommended.

10.1.3 *Year 2024 Cumulative Plus Project Traffic Conditions*

The results of the intersection capacity and queueing analyses presented previously in *Tables 8-3 and 9-3* indicates that the proposed Project will not impact any of the six (6) key study intersections under the "Year 2024 Cumulative Plus Project" traffic scenario. Therefore, no improvements are recommended.

10.1.4 *Year 2024 Cumulative Plus Project Traffic Conditions with "Complete Streets" Improvements*

The results of the intersection capacity and queueing analyses presented previously in *Tables 8-4 and 9-4* indicates that the proposed Project will not impact any of the six (6) key study intersections under the "Year 2024 Cumulative Plus Project Plus Road Diet" traffic scenario with the inclusion of the "complete streets" improvements along Atlantic Avenue. Therefore, no improvements are recommended.

11.0 SITE ACCESS EVALUATION

11.1 Project Driveway Level of Service Analysis

As shown in *Figure 2-2,* vehicular access to the Project site will be provided via one (1) existing full access unsignalized driveway located on along Linden Avenue. ***Table 11-1*** summarizes the intersection operations at the proposed driveway for Year 2024 cumulative traffic conditions upon completion and full occupancy of the proposed Project.

Review of *Table 11-1* indicates that the proposed driveway is forecast to operate at acceptable LOS A during both the AM and PM peak hours. Therefore, access to the project site is considered adequate and the proposed driveway configuration can accommodate forecast traffic volumes entering and exiting the Project site.

Appendix D presents the level of service calculation worksheets for the proposed Project driveways.

11.2 Sight Distance Evaluation

At intersections, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. Since the Project driveway is located offset to Hullet Street, a sight distance evaluation has been performed to determine any potential conflicts between the westbound left-turn at the Project driveway and the eastbound left-turn on Hullet Street.

The Sight Distance Evaluation prepared for the Project driveway and Hullet Street is based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual (HDM)* for "Private Road Intersections". Corner sight distance was utilized for the evaluation, although the Caltrans HDM, in Section 405.1(2)(c), page 400-27, indicates that for Private Road Intersections, "The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1...". Corner sight distance is defined in the Caltrans HDM to be the distance required by the driver of a vehicle, traveling at a given speed, to maneuver their vehicle and avoid an object without radically altering their speed. Line of sight for corner sight distance is to be determined from a 3½ foot height at the location of the driver of a vehicle on a minor road to a 3½ foot object height in the center of the approaching lane of the major road.

Based on the criteria set forth in Table 405.1A of the Caltrans HDM and a speed of 25 mph on Linden Avenue, the corner sight distance required is 276 feet for vehicles approaching from the right and 239 feet for vehicles approaching from the left.

Figure 11-1 presents the results of the sight distance evaluation at the Project driveway and Hullet Street. As shown, the sight lines are expected to be adequate as long as obstructions within the sight triangles are minimized. Therefore, it can be concluded that potential conflicts between the westbound left-turn at the Project driveway and the eastbound left-turn on Hullet Street would be minimal due to adequate visibility.

TABLE 11-1
PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Project Driveway	**Time Period**	**Intersection Control**	**(1) Year 2024 Cumulative Plus Project Traffic Conditions**	
			Delay (s/v)	**LOS**
A. Linden Avenue at Project Driveway 1	AM	One-Way Stop	8.6	A
	PM		8.6	A

Notes:

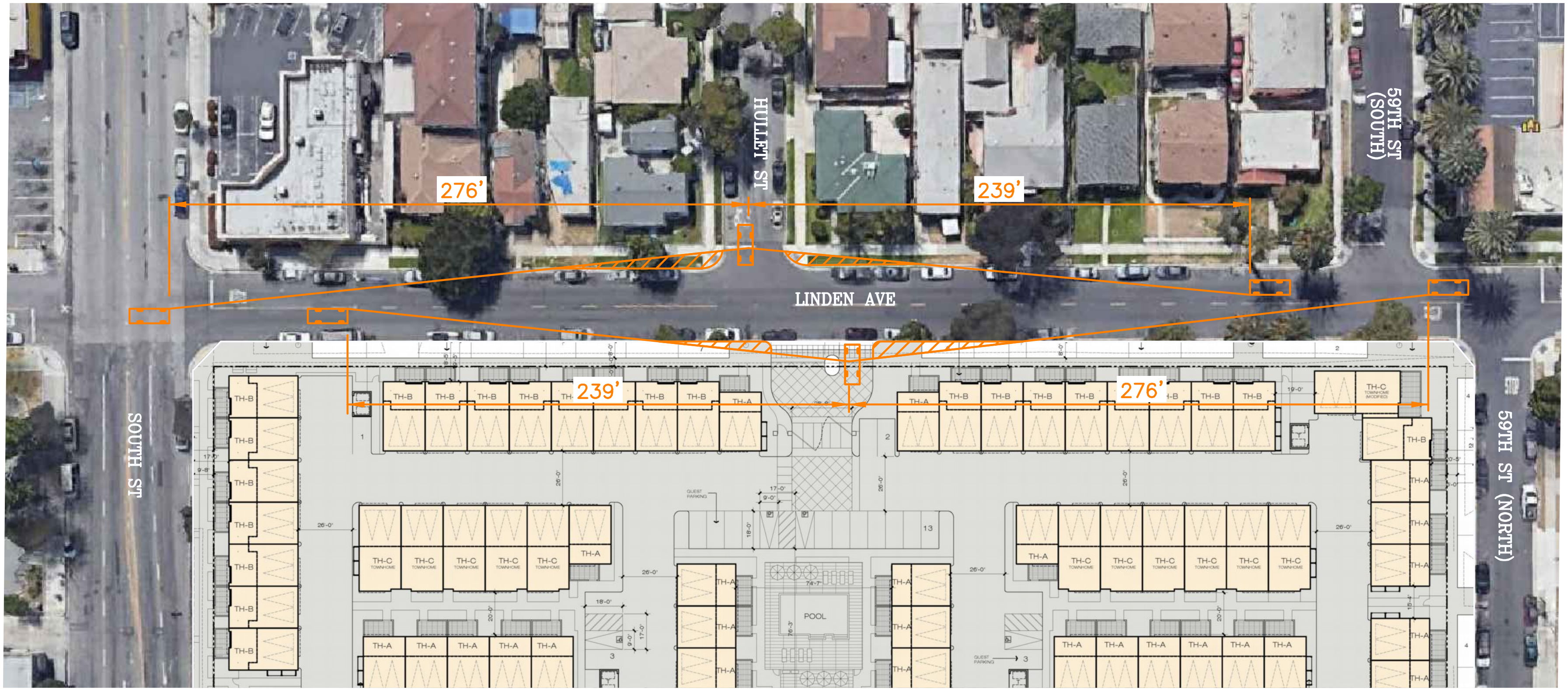
- s/v = seconds per vehicle (delay)

SIGHT DISTANCE

DESIGN SPEED LIMIT:	25 MPH
REQUIRED CORNER SIGHT DISTANCE FOR VEHICLES APPROACHING FROM THE RIGHT	276 FEET
REQUIRED CORNER SIGHT DISTANCE FOR VEHICLES APPROACHING FROM THE LEFT	239 FEET

LEGEND

▨ *LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 30 INCHES. NO FENCES OR WALLS IN LIMITED USE AREA.*



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LINSCOTT
LAW &
GREENSPAN
engineers

N

SCALE: 1"=80'

SOURCE: WITHEE MALCOM ARCHITECTS

FIGURE 11-1

SIGHT DISTANCE ANALYSIS

ATLANTIC RESIDENTIAL, LONG BEACH

12.0 CONGESTION MANAGEMENT PROGRAM COMPLIANCE ASSESSMENT

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

For purposes of the CMP, a significant impact occurs when the proposed Project increases traffic demand on a CMP facility by two percent of capacity (V/C ≥ 0.02), causing LOS F (V/C > 1.00). If the facility is already at LOS F, a significant impact occurs when the proposed Project increases traffic demand on a CMP facility by two percent of capacity (V/C ≥ 0.02).

12.1 Traffic Impact Review

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

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

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

12.1.1 *Intersections*

The following CMP intersection monitoring locations in the project vicinity have been identified:

CMP Station	Intersection/Jurisdiction
No. 34	Lakewood Boulevard at Carson Street

As stated earlier, the CMP guidelines require that arterial monitoring intersection locations must be examined if the proposed Project will add 50 or more trips during either the AM or PM weekday peak hours (of adjacent street traffic) at CMP monitoring intersections. Based on the proposed Project's trip generation potential, trip distribution and trip assignment, the Project will not add more than 50 trips at the identified CMP intersections during the weekday AM peak hour or PM peak hour. Therefore, a CMP intersection traffic impact analysis is not required.

12.1.2 *Freeways*

The following CMP freeway monitoring locations in the project vicinity have been identified:

CMP Station	Intersection/Jurisdiction
No. 1034	SR-91, east of Cherry Avenue

As stated earlier, the CMP TIA guidelines require that freeway monitoring locations must be examined if the proposed Project will add 150 or more trips (in either direction) during either the AM or PM weekday peak periods. Based on the project's trip generation potential and distribution pattern, the proposed Project will not add more than 150 trips during the AM or PM peak hour at this CMP mainline freeway-monitoring location. Therefore, a CMP freeway traffic impact analysis is not required.

12.2 Transit Impact Review

As required by the current *Congestion Management Program for Los Angeles County*, a review has been made of the potential impacts of the project on transit service. As previously discussed, and shown in *Figure 3-7*, a number of transit services exist in the project area, necessitating the following transit impact review.

The project trip generation, as shown in *Table 5-1*, was adjusted by values set forth in the CMP (i.e. person trips equal 1.4 times vehicle trips, and transit trips equal 7 percent of the total person trips) to estimate project-related transit trip generation. Pursuant to the CMP guidelines, the proposed Project is forecast to generate 4 transit trips (2 inbound and 2 outbound) during the AM peak hour and 5 transit trips (3 inbound and 2 outbound) during the PM peak hour. Over a 24-hour period the proposed Project is forecasted to generate 57 daily weekday transit trips.

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

13.0 CONSTRUCTION ASSESSMENT

This section of the report summarizes the potential traffic impacts due to construction activities, specifically remedial grading at the Project site. The following section describes the potential construction related trips associated with the construction activity and provides an assessment as to whether or not the forecast construction trips will have an impact on the existing street system.

13.1 Construction Traffic Trip Generation

In order to forecast the potential construction related trips associated with the construction activities at the project site, the following assumptions, as provided by Brandywine Homes, have been utilized.

Remedial Grading

- A two-week (14 days) operation and nine-hour workday was assumed.
- Maximum of 12 delivery/haul trucks per day (i.e. 24 total daily truck trips).
- A total of 3 workers will be on the site per day.

In addition to the aforementioned assumptions for each construction component, the following assumptions were utilized for truck trips and employee trips.

- Each truckload requires an inbound trip and an outbound trip.
- The daily number of truck trips was averaged over the nine-hour workday to obtain the number of peak hour truck trips (50% entering and 50% exiting).
- All truck trips were converted to passenger car equivalents (P.C.E.'s) using a P.C.E. factor of 3.0.
- Each worker would make 2 trips per day (one during the AM peak hour and one during the PM peak hour).

Using the aforementioned assumptions, ***Table 13-1*** provides a summary of the forecast construction peak hour and daily traffic volumes. Review of *Table 13-1* shows that the remedial grading construction component is expected to generate 78 daily trips with 12 trips produced during the AM peak hour and 12 trips produced during the PM peak hour.

When compared to the trips generated by the proposed Project, the remedial grading construction component is expected to generate 501 *fewer* daily trips, 32 *fewer* trips produced during the AM peak hour, and 36 *fewer* trips produced during the PM peak hour. Therefore, it can be concluded that the construction traffic would not impact the surrounding street system.

TABLE 13-1

PROJECT CONSTRUCTION–RELATED TRAFFIC GENERATION

Project Description	**Daily 2-Way**	**AM Peak Hour**			**PM Peak Hour**		
		Enter	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Remedial Grading Generation Forecast:							
▪ Construction Truck Traffic (12 Trucks)	24	2	1	3	1	2	3
Passenger Car Equivalent Factor[26]	3	3	3	3	3	3	3
Subtotal	72	6	3	9	3	6	9
▪ Employees (3 Workers)	6	3	0	3	0	3	3
Total Remedial Grading Construction Related Traffic Trip Generation Potential	**78**	**9**	**3**	**12**	**3**	**9**	**12**

---

[26] A passenger car equivalent factor of 3.0 was applied to the truck trips to convert them into passenger car trips.

13.2 Construction Management Plan

To help minimize any potential congestion along the existing street system related to the Project construction trips associated with trucks and employees traveling to and from the Project site in the morning and afternoon during Project construction activities, a Construction Management Plan is recommended to mitigate any potential short-term traffic impacts.

To ensure impacts to the surrounding street system are kept to a minimum, it is recommended that the Construction Management Plan for the proposed Project be developed in coordination with the City of Long Beach prior to the start of construction and, at a minimum, address the following:

- Ingress and egress for the construction truck and worker traffic would be via Linden Avenue and/or Atlantic Avenue. It is recommended to coordinate with the City to determine if a flagman would be required to assist with ingress and egress for trucks and construction equipment.
- Traffic control for any street closure, detour or other disruption to traffic circulation.
- Identify the routes that construction vehicles will utilize for the delivery of construction materials (i.e. lumber, tiles piping, windows, etc.), to access the site, traffic controls and detours and proposed construction phasing plan for the Project.
- Coordinate with the City to identify parking needs and parking areas for construction related equipment and workman support. Review of the existing site suggests that parking may potentially be available on site.
- Specify the hours during which transport activities can occur and methods to mitigate construction-related impacts to adjacent streets.
- Require the Applicant to keep all haul routes clean and free of debris including but not limited to gravel and dirt as a result of its operations. The Applicant shall clean adjacent streets, as directed by the City Engineer (or representative of the City Engineer) of any material which may have been spilled, tracked or blown onto adjacent streets or areas.
- Hauling or transport of oversize loads will be coordinated with the City as to the haul route as well as the hours allowed. Hauling or transport may be permitted/required during nighttime hours, weekends or Federal holidays, at the discretion of the City Engineer. All hauling/delivery access to and from the site will be from Atlantic Avenue. An approved Haul Route Permit will be required from the City.
- Haul trucks entering or exiting public streets shall at all times yield to public traffic.
- If hauling operations cause any damage to existing pavement, street, curb and/or gutter along the haul route, the applicant will be fully responsible for repairs. The repairs shall be completed to the satisfaction of the City Engineer.
- This Plan shall meet standards established in the current *California Manual on Uniform Traffic Control Device (MUTCD)* as well as City of Long Beach requirements.

14.0 VEHICLE MILES TRAVELED (VMT) ANALYSIS

14.1 SB743 Compliance VMT Screening Assessment

The purpose of this Vehicle Miles Traveled (VMT) analysis is to evaluate the Project based on Senate Bill 743 (SB 743) requirements consistent with the *Technical Advisory on Evaluating Transportation Impacts In California Environmental Quality Act* (CEQA), December 2018, prepared by the State of California Governor's Office of Planning and Research (OPR). The OPR Technical Advisory provides project screening criteria and guidance for analysis of VMT assessments under SB 743. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled. Lead agencies are allowed to continue using their current impact criteria, or to opt into the revised transportation guidelines. However, the new guidelines must be used starting July 1, 2020, as required in CEQA section 15064.3.

For the VMT screening analysis, the presumption of less than significant impact near Transit Stations was applied to the proposed Project. Proposed CEQA Guideline Section 5064.3, subdivision (b), states that "generally, [land use] projects within one-half mile of either an existing major transit stop or an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact". A high-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. Review of the Long Beach Transit Priority Areas Map from the *City of Long Beach Traffic Impact Analysis Guidelines dated June 2020* shows the area along Atlantic Avenue within the City of Long Beach as falling within half a mile from high quality transit corridor or major transit stop. Since the proposed Project is considered to be located within half a mile of an existing high-quality transit corridor, this project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

In addition, screening for small projects and retail developments was also applied to the proposed Project. *Section 2.24 Screening and Thresholds for Other Land Uses* of the *City of Long Beach Traffic Impact Analysis Guidelines dated June 2020* states the following:

> "Retail development that is 50,000 square feet (sf) or less is likely to be local-serving and tends to shorten trips within Long Beach. Therefore, any retail project 50,000 sf or less will be presumed to have a less than significant transportation impact related to CEQA Guidelines Section 15064.3, subdivision (b)."

As stated in Section 2.0, the proposed Project consists of two commercial/retail buildings totaling 2,000 SF which is less than the 50,000 SF threshold for small projects. Therefore, the commercial/retail component of the Project can be screened from further VMT analysis and the commercial/retail component can be presumed to have a less than significant impact on VMT.

The City of Long Beach has identified a 500 trip threshold for screening small projects. The residential component of the Project falls below the 500 trip threshold for VMT analysis. Therefore, the residential component of the Project can be presumed to have a less than significant impact on VMT. Additionally, the construction and clean-up component of the proposed Project is expected to generate 78 daily trips, which also falls below the 500-trip threshold for VMT analysis. Therefore, the construction component of the proposed Project can be presumed to have a less than significant impact on VMT.

APPENDIX A

TRAFFIC STUDY SCOPE OF WORK

LINSCOTT
LAW &
GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

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Greenspan, Engineers**
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www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

MEMORANDUM

To: Mr. Carl Hickman,
City Traffic Engineer – City of Long Beach

Date: March 9, 2021

From: Richard E. Barretto, P.E., Principal
Linscott, Law & Greenspan, Engineers

Barretto

LLG Ref: 2.21.4386.1

Subject: ***Traffic Study Scope of Work for the Atlantic Residential Project***
Long Beach, California

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Traffic Study Scope of Work for the proposed Atlantic Residential Project in the City of Long Beach for the City's review and approval.

Traffic Study Scope of Work

The Traffic Study for the proposed Atlantic Residential Project (herein referred to as "Project") will be prepared according to and satisfy the traffic impact requirements of the City of Long Beach and will be consistent with the requirements and procedures outlined in the most current Congestion Management Program (CMP) for Los Angeles County.

A. Project Location: The existing site, located along the eastside of Atlantic Avenue between 59th Street and South Street, is currently vacant. ***Figure 1-1*** presents a Vicinity Map that illustrates the general location of the Project and surrounding street system. ***Figure 2-1*** displays the existing sites aerial.

B. **Project Description:** The proposed Project includes the construction of an 84-unit multifamily residential development with 2,000 SF of restaurant/café uses. Access to the project site will be provided via a full access driveway located midblock along Linden Avenue. Parking for the proposed Project will be provided via 39 on-street parking spaces along with 229 spaces located on-site. The on-site spaces include 168 attached garage spaces and 22 surface parking stalls. ***Figure 2-2*** presents the Project's Proposed Site Plan.

C. **Potential Traffic Study Locations:** The following six (6) intersections listed below have been identified by the City for which the Project's potential traffic impact is to be assessed.

1. Atlantic Avenue at 59th Street
2. Atlantic Avenue at South Street
3. Linden Avenue at 59th Street (north)
4. Linden Avenue at 59th Street (south)
5. Linden Avenue at Hullet Street
6. Linden Avenue at South Street

D. Traffic Counts: Due to COVID-19 the ability to collect traffic counts to establish baseline conditions is not possible. As such, to establish “baseline” traffic conditions, pre-COVID-19, LLG has researched historic data and was able to obtain Year 2019 counts at the intersections of Atlantic Avenue/59th Street and Atlantic Avenue/South Street. Given the availability of this historic data, LLG proposes the following to establish pre-COVID-19 traffic conditions:

(1) Historic data is available at the intersection of Atlantic Avenue/59th Street and Atlantic Avenue/South Street (Intersection #1 and #2) for Year 2019.

(2) Given data is not available at four study locations (Intersections #3, #4, #5 and #6), LLG will collect Year 2021 COVID-19 traffic counts at all six study locations for use in establishing traffic counts/turning movement percentages.

(3) Using information from (1) and (2), compare 2019 to 2021 to establish change in traffic counts due to current COVID-19 environment.

(4) Apply the rate calculated in (3) to the 2021 COVID-19 traffic counts and forecast 2019 traffic conditions for Intersections #3, #4, #5, and #6.

(5) Lastly, apply an annual growth factor of 1% per year for two years to the Year 2019 traffic conditions to establish Year 2021 pre-COVID-19 baseline traffic conditions.

E. Traffic Generation: The trip generation potential of the proposed Project will be estimated using trip rates contained in the 10th Edition of Trip Generation, published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the Project’s forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 5-1*, ITE Land Use 221: Multifamily Housing (Mid-Rise) and ITE Land Use 932: High Turnover Sit Down Restaurant were used to forecast the trip generation potential of the proposed Project.

A review of the lower portion of this table indicates that the proposed Project is forecast to generate approximately 579 daily trips, with 44 trips (16 inbound, 28 outbound) produced in the AM peak hour and 48 trips (30 inbound, 18 outbound) produced in the PM peak hour on a “typical” weekday.

Please note that a 5% non-auto trip reduction was applied to the trip generation to account for other modes of transportation (i.e. public transit, walking, biking, etc.).

F. **Trip Distribution:** See attached ***Figure 5-1*** for the project trip distribution pattern. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- ingress/egress availability at the project site, plus parking layout and allocation within the subject property.

G. **Near-Term Background Traffic:**

- Project Completion: 2024, to be confirmed with project applicant.
- Ambient Growth Rate: 0.4% per year
- Cumulative Projects: Planned and/or approved projects within a two-mile radius and in the vicinity of the Project site may contribute traffic to the Project study area will be researched at the Cities of Long Beach.

H. **Analysis Scenarios:** Consistent with the City's TIA Guidelines, the following are the proposed traffic analysis scenarios.

(a) Existing traffic conditions;
(b) Existing plus Project traffic conditions;
(c) Scenario (b) with Mitigation, if necessary;
(d) Opening Year (2024) Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
(e) Opening Year (2024) plus Project Traffic Conditions;
(f) Scenario in (e) with Mitigation, if necessary;

I. **LOS Methodology and Significant Impact Criteria:** The LOS calculations will be based on the Highway Capacity Manual (HCM) method of analysis for signalized and unsignalized intersections.

All signalized and unsignalized intersections or project driveways will be analyzed using the methodology contained in the most current Highway Capacity Manual (HCM).

The City of Long Beach requires intersection mitigation for any of the following elements:

- Under without project conditions, the intersection operates at LOS D or better and the addition of project trips results in unacceptable LOS (LOS E/F), OR
- Operates as LOS E or F and the project increases average control delay at the intersection by 2.5 seconds or more, OR
- Under the project conditions, the 95th percentile queue length exceeds the available storage length at any turn bay.

Other Issues:

- Conduct a CMP compliance assessment, and
- Conduct a VMT assessment.

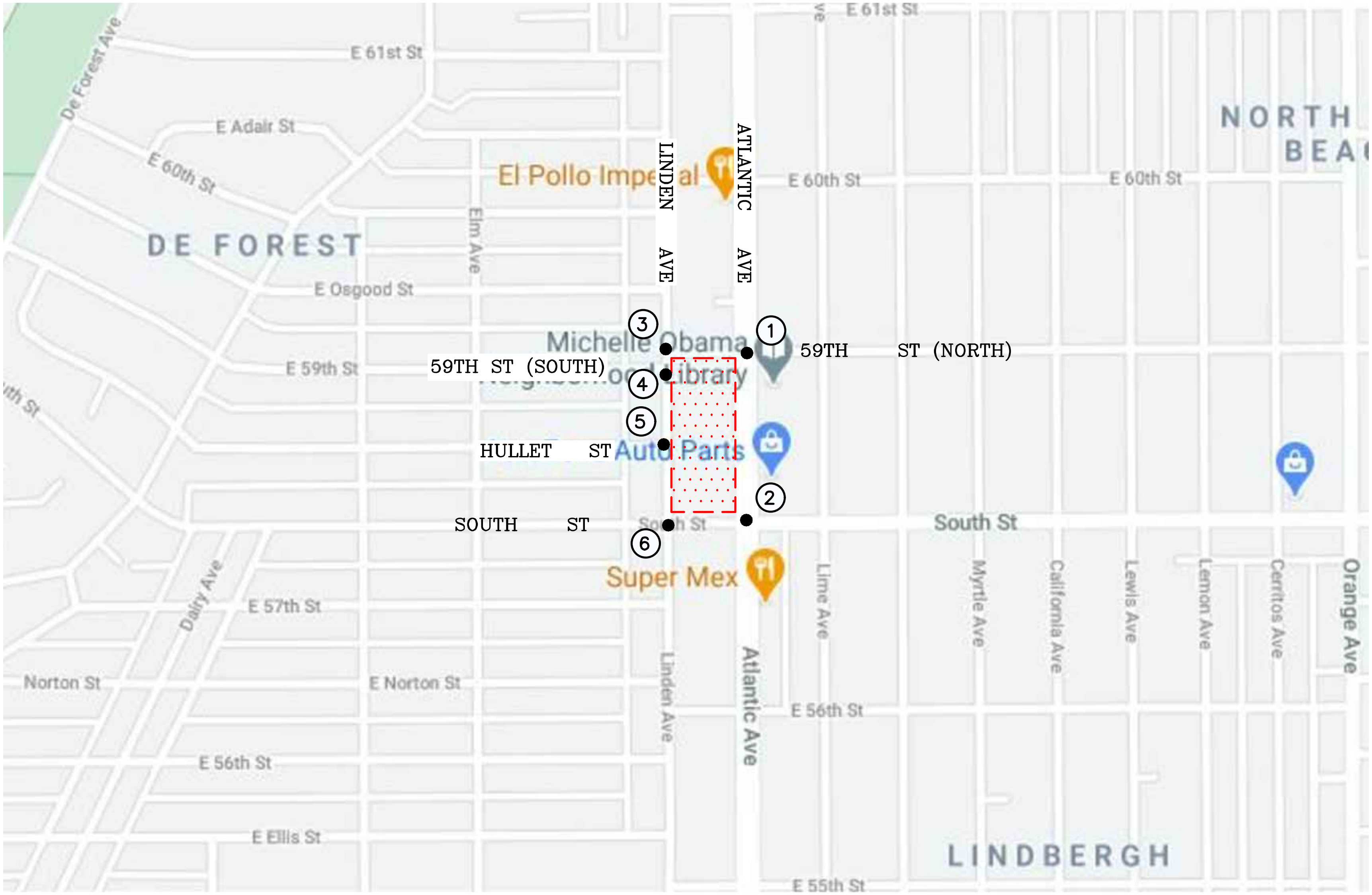
We appreciate the opportunity to provide this scope of work. Should you have any questions, please call me at (949) 825-6175. Thank You.

Approved by:

_______________________________________ ___________

City of Long Beach Date

cc: File
Shane Green, P.E., Senior Transportation Engineer



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engineers

N

NO SCALE

SOURCE: GOOGLE

KEY

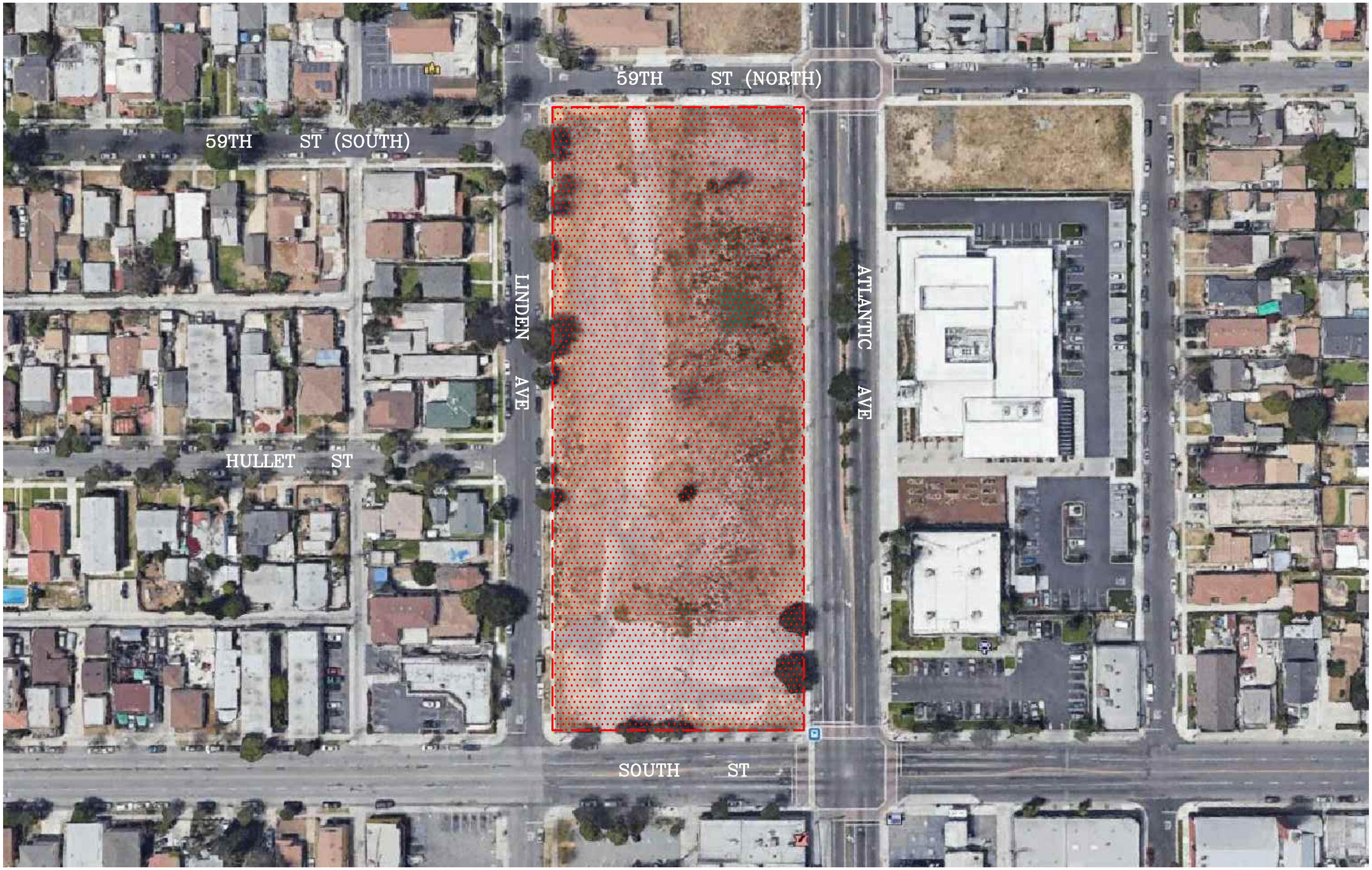
(#) = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 1–1

VICINITY MAP

LONG BEACH 84 TOWNHOMES, LONG BEACH



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N
NO SCALE

SOURCE: GOOGLE

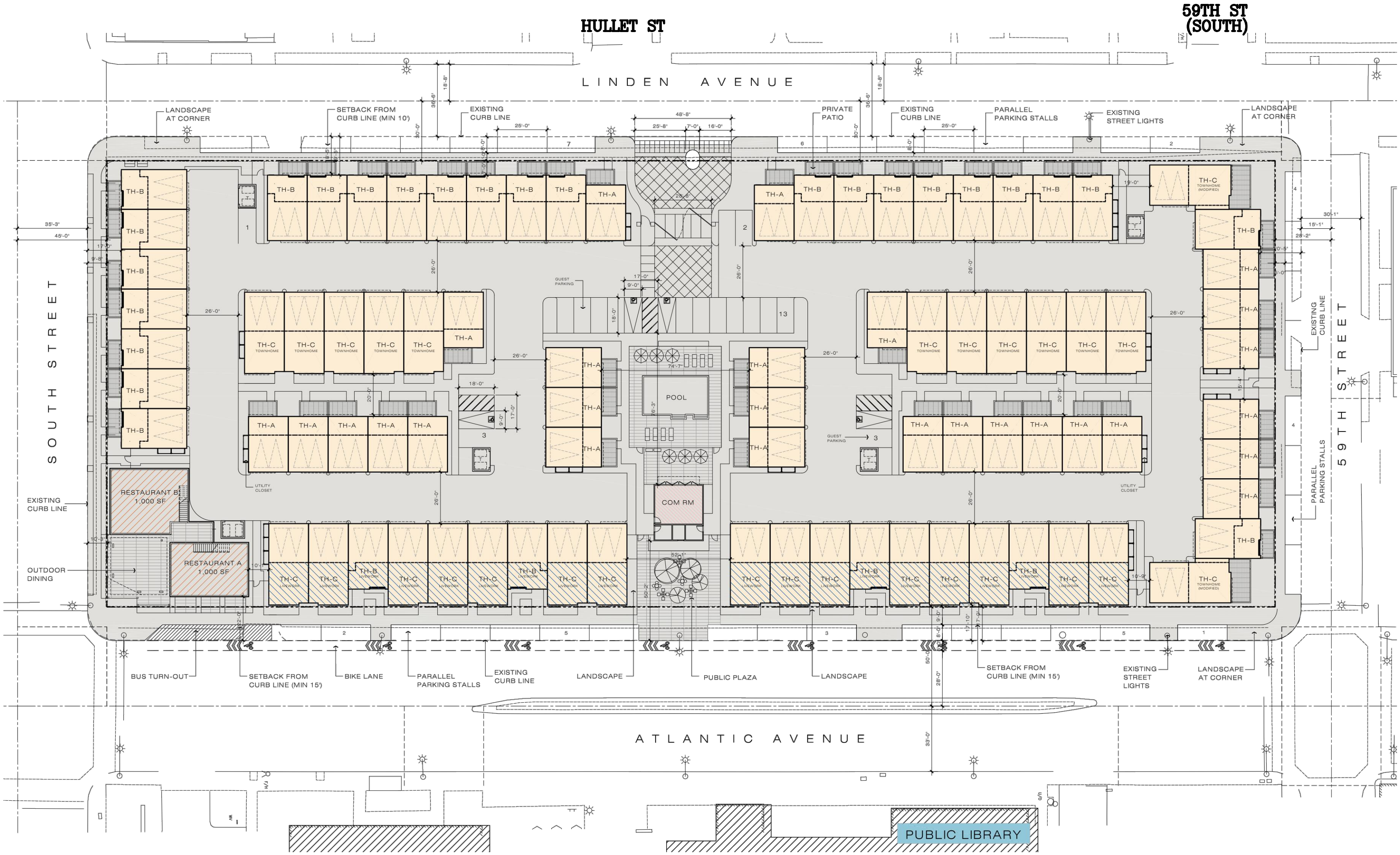
KEY

▨ = PROJECT SITE

FIGURE 2–1

EXISTING SITE AERIAL

LONG BEACH 84 TOWNHOMES, LONG BEACH



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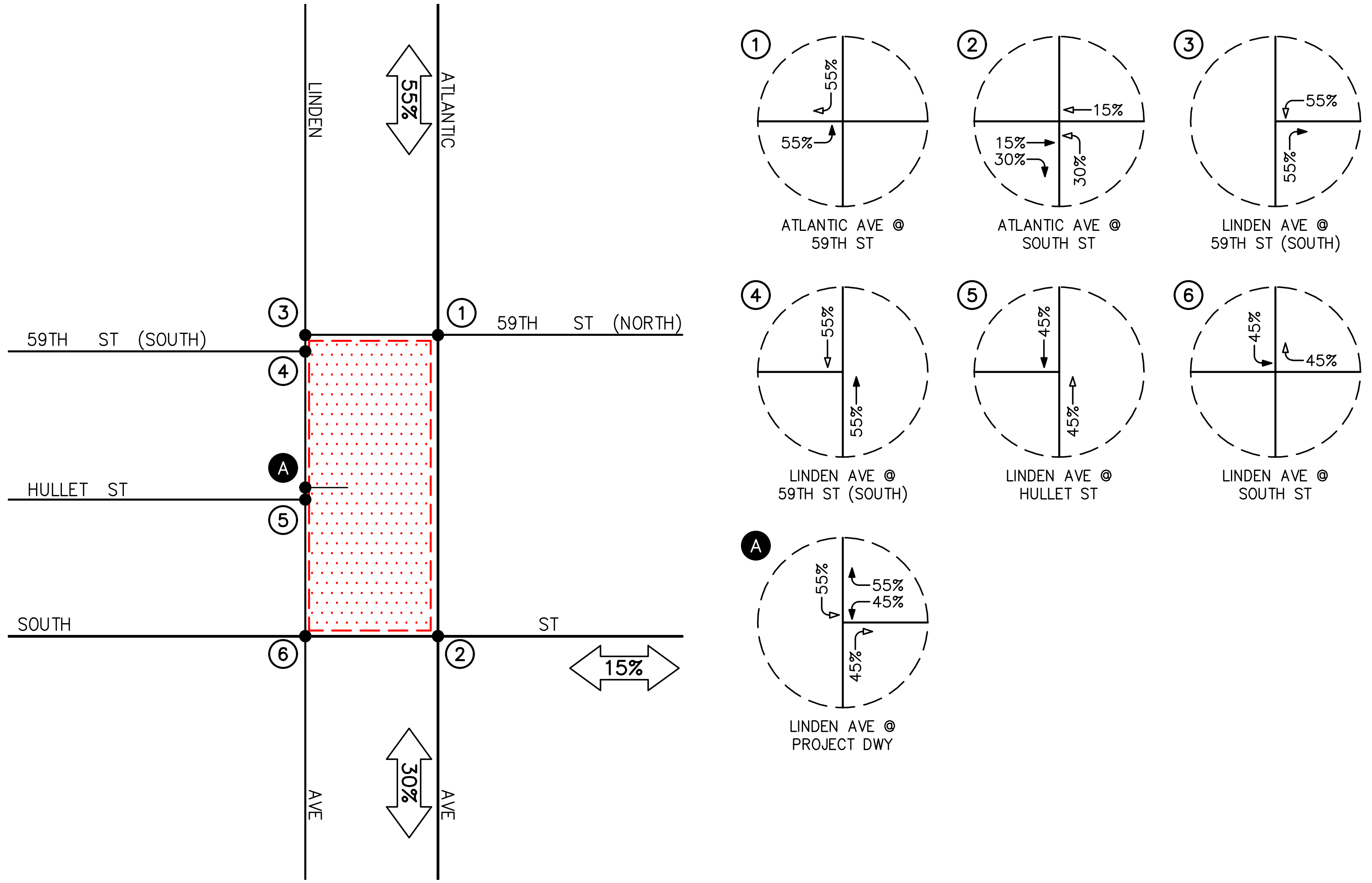
NO SCALE

SOURCE: WITHEE MALCOM ARCHITECTS

FIGURE 2-2

PROPOSED SITE PLAN

LONG BEACH 84 TOWNHOMES, LONG BEACH



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NO SCALE

KEY

Ⓧ = STUDY INTERSECTION
◁— = INBOUND PERCENTAGE
◀— = OUTBOUND PERCENTAGE
▨ = PROJECT SITE

FIGURE 5–1

PROJECT TRIP DISTRIBUTION PATTERN

LONG BEACH 84 TOWNHOMES, LONG BEACH

TABLE 5-1
PROJECT TRAFFIC GENERATION RATES[1]
ATLANTIC RESIDENTIAL, LONG BEACH

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Rates:							
▪ 221: Multifamily Housing (Mid-Rise[2]) (TE/DU)	5.44	26%	74%	0.36	61%	39%	0.44
▪ 932: High Turnover Sit Down Restaurant (TE/1000 SF)	112.18	55%	45%	9.94	62%	38%	9.77
Generation Forecasts:							
▪ 220: Apartments (84 DU)	457	8	22	30	23	14	37
Internal Capture[3]	*-36*	*0*	*-2*	*-2*	*-1*	*-2*	*-3*
Subtotal	421	8	20	28	22	12	34
▪ 932: Restaurant (2,000 SF)	224	11	9	20	12	8	20
Internal Capture[3]	-36	-2	0	-2	-2	-1	-3
Subtotal	*188*	*9*	*9*	*18*	*10*	*7*	*17*
Project Trip Generation Subtotal	**609**	**17**	**29**	**46**	**32**	**19**	**51**
Non-Auto Trip Adjustment (5%)	**-30**	**-1**	**-1**	**-2**	**-2**	**-1**	**-3**
Net Trip Generation Potential	**579**	**16**	**28**	**44**	**30**	**18**	**48**

Notes:
TE/DU = Trip end per dwelling unit
TE/1000 SF = Trip end per 1,000 SF

---

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

[2] Mid Rise Multifamily Housing consists of buildings that range between 3 and 10 levels.

[3] Consistent with the *Trip Generation Handbook*, published by ITE (2017). Project trip generation was adjusted to account for internal capture between the apartment buildings and the restaurant components of the Project.

APPENDIX B

EXISTING TRAFFIC COUNT DATA

Table B-1
Year 2021 Pre-COVID-19 Baseline Volume Development

Study Intersection	(1) 2019 AM Intersection Volume	(2) 2019 PM Intersection Volume	(3) 2021 COVID-19 AM Volume	(4) 2021 COVID-19 PM Volume	(5) 2021 COVID-19 AM Growth Per Year (%) [1]	(6) 2021 COVID-19 PM Growth Per Year (%) [2]	(7) 2019 Adjusted AM Intersection Volume [3]	(8) 2019 Adjusted PM Intersection Volume [4]	(9) 2019 Baseline AM Intersection Volume	(10) 2019 Baseline PM Intersection Volume	(11) 2021 Baseline AM Intersection Volume by applying 0.4% per year to Column 9	(12) 2021 Baseline PM Intersection Volume by applying 0.4% per year to Column 10
1. Atlantic Avenue at 59th Street	1,710	2,066	1,047	1,708	-31.7%	-10.5%	--	--	1,710	2,066	1,724	2,083
2. Atlantic Avenue at South Street	2,525	2,987	1,437	2,339	-37.9%	-13.9%	--	--	2,525	2,987	2,545	3,011
3. Linden Avenue at 59th Street (North)	--	--	94	146	--	--	159	182	159	182	160	183
4. Linden Avenue at 59th Street (South)	--	--	69	107	--	--	117	133	117	133	118	134
5. Linden Avenue at Hullet Street	--	--	48	64	--	--	81	80	81	80	82	81
6. Linden Avenue at South Street	--	--	405	638	--	--	687	794	687	794	692	800
Average Growth Rate Per Year					-34.8%	-12.2%						

Notes:

[1] [(Column 3 - Column 1)/Column 3] / (2021-2019)

[2] [(Column 4 - Column 2)/Column 4] / (2021-2019)

[3] 2019 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 5.
Column 3 + [Column 3 × (34.8% × (2021 - 2019))]

[4] 2019 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 6.
Column 4 + [Column 4 × (12.2% × (2021 - 2019))]

National Data & Surveying Services

Intersection Turning Movement Count

Location: Atlantic Ave & E 59th St
City: Long Beach
Control: Signalized

Project ID: 21-020061-001
Date: 3/10/2021

Data - Total

NS/EW Streets:	Atlantic Ave				Atlantic Ave				E 59th St				E 59th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	79	0	0	2	94	0	0	1	0	1	0	4	0	4	0	185
7:15 AM	0	87	0	1	2	127	3	0	2	0	6	0	0	0	7	0	235
7:30 AM	1	80	1	0	1	110	1	0	4	1	9	0	3	0	6	0	217
7:45 AM	1	107	0	0	4	140	1	2	3	1	5	0	3	0	3	0	270
8:00 AM	2	99	1	0	4	133	2	0	7	0	10	0	3	0	4	0	265
8:15 AM	4	105	3	0	7	131	2	0	4	0	5	0	3	0	3	0	267
8:30 AM	0	84	3	0	2	133	2	0	5	0	7	0	0	0	5	0	241
8:45 AM	5	103	1	0	2	146	3	1	3	0	4	0	0	1	5	0	274
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	13	744	9	1	24	1014	14	3	29	2	47	0	16	1	37	0	1954
APPROACH %'s :	1.69%	97.00%	1.17%	0.13%	2.27%	96.11%	1.33%	0.28%	37.18%	2.56%	60.26%	0.00%	29.63%	1.85%	68.52%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	11	391	8	0	15	543	9	1	19	0	26	0	6	1	17	0	1047
PEAK HR FACTOR :	0.550	0.931	0.667	0.000	0.536	0.930	0.750	0.250	0.679	0.000	0.650	0.000	0.500	0.250	0.850	0.000	0.955
	0.915				0.934				0.662				0.857				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	169	8	0	7	196	10	2	1	1	6	0	0	0	4	0	409
4:15 PM	7	179	4	0	5	177	10	3	1	2	4	0	3	0	3	0	398
4:30 PM	6	171	3	1	7	199	16	1	3	0	5	0	1	1	4	0	418
4:45 PM	5	179	8	0	7	194	4	0	5	0	6	0	3	0	7	0	418
5:00 PM	11	192	4	1	6	209	4	2	2	1	7	0	2	0	4	0	445
5:15 PM	4	189	3	1	7	188	4	1	4	0	6	0	1	1	6	0	415
5:30 PM	3	210	3	1	8	180	8	1	2	0	8	0	1	1	4	0	430
5:45 PM	6	177	2	0	10	166	6	4	2	0	6	0	1	0	3	0	383
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	47	1466	35	4	57	1509	62	14	20	4	48	0	12	3	35	0	3316
APPROACH %'s :	3.03%	94.46%	2.26%	0.26%	3.47%	91.90%	3.78%	0.85%	27.78%	5.56%	66.67%	0.00%	24.00%	6.00%	70.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	23	770	18	3	28	771	20	4	13	1	27	0	7	2	21	0	1708
PEAK HR FACTOR :	0.523	0.917	0.563	0.750	0.875	0.922	0.625	0.500	0.650	0.250	0.844	0.000	0.583	0.500	0.750	0.000	0.960
	0.938				0.931				0.932				0.750				

Prepared by National Data & Surveying Services

Atlantic Ave & E 59th St

Peak Hour Turning Movement Count

ID: 21-020061-001
City: Long Beach

Day: Wednesday
Date: 3/10/2021

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	7:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	4:00 PM - 06:00 PM

Atlantic Ave

SOUTHBOUND

AM	9	543	15	1	428	AM
NOON	0	0	0	0	0	NOON
PM	20	771	28	4	808	PM
	↲	↓	↳	↶	⇧	
	0	2	1	0		

E 59th St

EASTBOUND

AM	NOON	PM		
21	0	45	⇦	
0	0	0	↶	0
19	0	13	↱	0
0	0	1	→	1
26	0	27	↴	0
AM	NOON	PM		

CONTROL

Signalized

TEV	1047	0	1708
	AM	NOON	PM
PHF	0.96		0.96

E 59th St

WESTBOUND

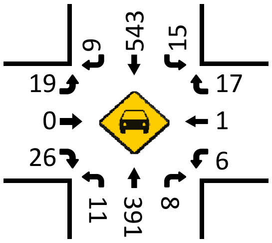
		PM	NOON	AM
0	↰	21	0	17
1	←	2	0	1
0	↙	7	0	6
0	↷	0	0	0
	⇨	47	0	23
		PM	NOON	AM

		0	1	2	0	
	⇩	↶	↰	↑	↱	
PM	808	3	23	770	18	PM
NOON	0	0	0	0	0	NOON
AM	575	0	11	391	8	AM

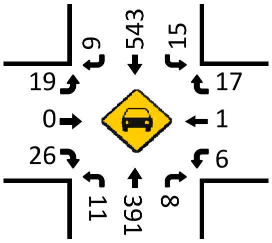
NORTHBOUND

Atlantic Ave

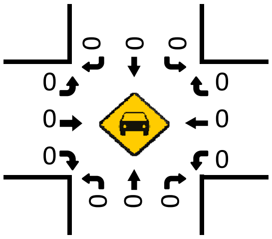
Totals (AM)



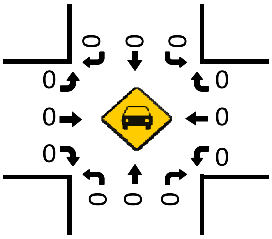
Totals (AM)



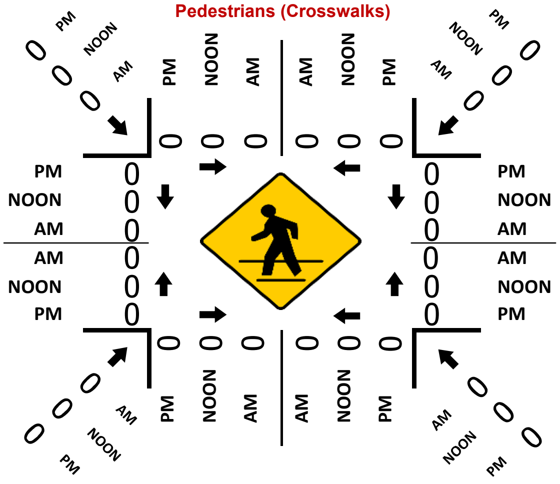
Totals (NOON)



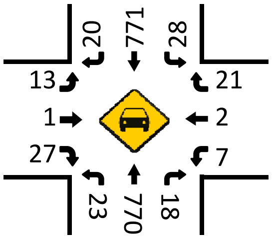
Totals (NOON)



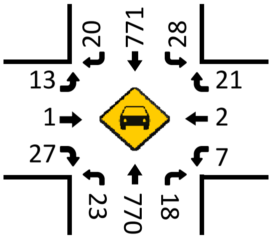
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



Prepared by National Data & Surveying Services

Location: Atlantic Ave & E 59th St
City: Long Beach
Control: Signalized

Project ID: 19-05675-008
Date: 11/6/2019

Total

NS/EW Streets:	Atlantic Ave				Atlantic Ave				E 59th St				E 59th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	121	1	0	4	149	0	0	6	1	7	0	2	0	8	0	300
7:15 AM	1	180	0	0	1	199	3	0	5	0	16	0	4	1	7	0	417
7:30 AM	7	188	1	0	2	258	2	0	6	0	16	0	1	1	7	0	489
7:45 AM	7	133	3	0	4	234	1	0	3	0	14	0	3	0	7	0	409
8:00 AM	5	162	3	1	4	186	4	1	8	0	10	0	3	1	7	0	395
8:15 AM	4	120	0	0	1	179	3	0	3	1	11	0	3	0	5	0	330
8:30 AM	3	141	4	0	3	168	0	1	6	1	10	0	1	1	5	0	344
8:45 AM	8	134	5	0	4	190	3	0	0	0	6	0	2	1	2	0	355
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	36	1179	17	1	23	1563	16	2	37	3	90	0	19	5	48	0	3039
APPROACH %'s :	2.92%	95.62%	1.38%	0.08%	1.43%	97.44%	1.00%	0.12%	28.46%	2.31%	69.23%	0.00%	26.39%	6.94%	66.67%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	20	663	7	1	11	877	10	1	22	0	56	0	11	3	28	0	1710
PEAK HR FACTOR :	0.714	0.882	0.583	0.250	0.688	0.850	0.625	0.250	0.688	0.000	0.875	0.000	0.688	0.750	1.000	0.000	0.874
	0.881				0.858				0.886				0.875				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	5	108	4	0	6	127	4	0	2	0	12	0	2	0	3	0	273
11:15 AM	5	130	6	1	6	146	2	1	1	0	2	0	0	0	5	0	305
11:30 AM	6	139	2	0	5	131	3	2	2	0	2	0	1	1	4	0	298
11:45 AM	3	106	4	2	4	149	2	2	0	1	8	0	4	0	7	0	292
12:00 PM	5	154	0	0	8	150	2	2	3	1	8	0	2	0	5	0	340
12:15 PM	3	149	1	0	5	146	2	1	5	0	8	0	1	0	6	0	327
12:30 PM	6	145	3	2	7	151	4	0	1	0	9	0	0	0	8	0	336
12:45 PM	5	152	2	0	4	159	3	0	2	0	12	0	2	0	5	0	346
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	38	1083	22	5	45	1159	22	8	16	2	61	0	12	1	43	0	2517
APPROACH %'s :	3.31%	94.34%	1.92%	0.44%	3.65%	93.92%	1.78%	0.65%	20.25%	2.53%	77.22%	0.00%	21.43%	1.79%	76.79%	0.00%	
PEAK HR :	12:00 PM - 01:00 PM																TOTAL
PEAK HR VOL :	19	600	6	2	24	606	11	3	11	1	37	0	5	0	24	0	1349
PEAK HR FACTOR :	0.792	0.974	0.500	0.250	0.750	0.953	0.688	0.375	0.550	0.250	0.771	0.000	0.625	0.000	0.750	0.000	0.975
	0.986				0.970				0.875				0.906				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	6	235	4	1	9	187	5	3	0	0	8	0	2	1	7	0	468
4:15 PM	7	229	7	0	11	194	5	1	2	0	7	0	3	1	6	0	473
4:30 PM	10	214	1	0	10	199	8	0	1	1	6	0	0	0	5	0	455
4:45 PM	6	208	8	1	7	225	3	0	5	2	7	0	0	1	7	0	480
5:00 PM	6	251	9	1	7	232	5	1	2	0	10	0	1	0	5	0	530
5:15 PM	12	262	6	0	11	209	11	2	4	0	17	0	1	1	4	0	540
5:30 PM	7	232	3	0	6	218	6	1	3	1	12	0	6	0	5	0	500
5:45 PM	6	227	9	0	10	209	6	1	3	0	10	0	6	1	8	0	496
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	60	1858	47	3	71	1673	49	9	20	4	77	0	19	5	47	0	3942
APPROACH %'s :	3.05%	94.41%	2.39%	0.15%	3.94%	92.84%	2.72%	0.50%	19.80%	3.96%	76.24%	0.00%	26.76%	7.04%	66.20%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	31	972	27	1	34	868	28	5	12	1	49	0	14	2	22	0	2066
PEAK HR FACTOR :	0.646	0.927	0.750	0.250	0.773	0.935	0.636	0.625	0.750	0.250	0.721	0.000	0.583	0.500	0.688	0.000	0.956
	0.921				0.954				0.738				0.633				

Prepared by National Data & Surveying Services

Atlantic Ave & E 59th St

Peak Hour Turning Movement Count

ID: 19-05675-008
City: Long Beach

Day: Wednesday
Date: 11/06/2019

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	12:00 PM - 01:00 PM	11:00 AM - 01:00 PM
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Atlantic Ave

SOUTHBOUND

AM	10	877	11	1	714
NOON	11	606	24	3	638
PM	28	868	34	5	1011
	0	2	1	0	

E 59th St

EASTBOUND

	AM	NOON	PM	
	33	30	61	
	0	0	0	0
	22	11	12	0
	0	1	1	1
	56	37	49	0

WESTBOUND

E 59th St

	PM	NOON	AM
0	22	24	28
1	2	0	3
0	14	5	11
0	0	0	0
	62	31	18

CONTROL

Signalized

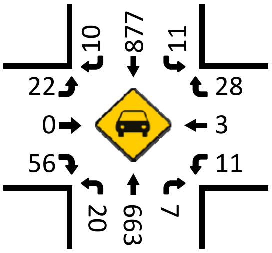
	AM	NOON	PM
TEV	1710	1349	2066
PHF	0.87	0.97	0.96

		0	1	2	0
PM	932	1	31	972	27
NOON	650	2	19	600	6
AM	945	1	20	663	7

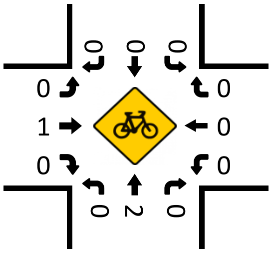
NORTHBOUND

Atlantic Ave

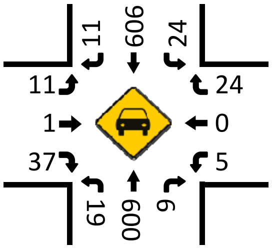
Total Vehicles (AM)



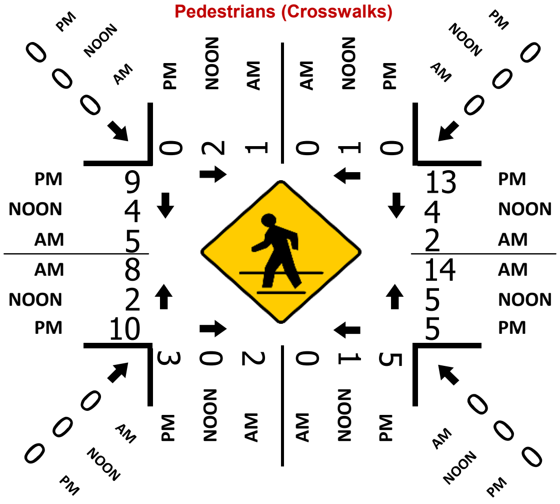
Bikes (AM)



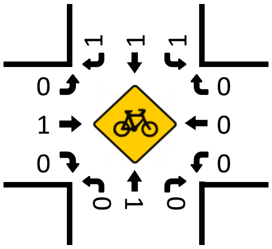
Total Vehicles (Noon)



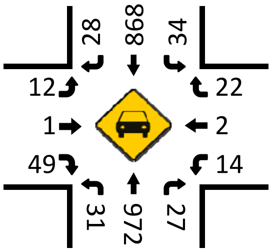
Pedestrians (Crosswalks)



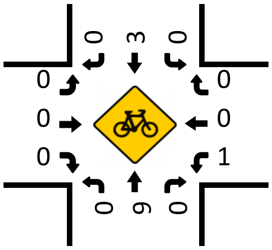
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Atlantic Ave & E South St
City: Long Beach
Control: Signalized

Project ID: 21-020061-002
Date: 3/10/2021

Data - Total

NS/EW Streets:	Atlantic Ave				Atlantic Ave				E South St				E South St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	5	43	11	0	13	85	8	0	11	23	2	0	19	10	25	0	255
7:15 AM	2	55	11	0	24	101	7	0	12	27	4	0	18	22	28	0	311
7:30 AM	1	57	12	0	21	97	11	0	9	31	10	0	25	34	20	0	328
7:45 AM	3	75	13	0	18	119	6	0	13	32	10	0	26	26	24	0	365
8:00 AM	3	60	18	0	22	107	13	0	18	32	6	0	26	28	26	0	359
8:15 AM	11	65	17	0	21	107	8	0	14	33	10	0	23	16	25	0	350
8:30 AM	8	72	17	0	25	108	20	0	14	23	10	0	25	22	19	0	363
8:45 AM	4	69	15	0	31	107	6	0	16	26	7	0	22	20	16	0	339
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	37	496	114	0	175	831	79	0	107	227	59	0	184	178	183	0	2670
APPROACH %'s :	5.72%	76.66%	17.62%	0.00%	16.13%	76.59%	7.28%	0.00%	27.23%	57.76%	15.01%	0.00%	33.76%	32.66%	33.58%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	25	272	65	0	86	441	47	0	59	120	36	0	100	92	94	0	1437
PEAK HR FACTOR :	0.568	0.907	0.903	0.000	0.860	0.926	0.588	0.000	0.819	0.909	0.900	0.000	0.962	0.821	0.904	0.000	0.984
	0.933				0.938				0.943				0.894				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	15	122	39	0	47	135	13	0	19	43	11	0	38	46	37	0	565
4:15 PM	17	146	26	1	44	135	14	0	13	43	10	0	39	45	39	0	572
4:30 PM	11	140	32	1	49	133	17	0	19	51	11	0	25	53	30	0	572
4:45 PM	11	137	30	0	51	137	18	0	21	59	12	0	27	44	35	0	582
5:00 PM	15	172	37	0	49	147	19	0	13	51	8	0	31	33	29	0	604
5:15 PM	11	142	26	0	50	129	13	0	12	52	13	0	35	39	41	0	563
5:30 PM	11	148	33	0	44	138	15	0	24	49	12	0	35	41	40	0	590
5:45 PM	12	134	21	0	55	105	19	0	20	38	8	0	24	45	22	0	503
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	103	1141	244	2	389	1059	128	0	141	386	85	0	254	346	273	0	4551
APPROACH %'s :	6.91%	76.58%	16.38%	0.13%	24.68%	67.20%	8.12%	0.00%	23.04%	63.07%	13.89%	0.00%	29.10%	39.63%	31.27%	0.00%	
PEAK HR :	**04:45 PM - 05:45 PM**																TOTAL
PEAK HR VOL :	48	599	126	0	194	551	65	0	70	211	45	0	128	157	145	0	2339
PEAK HR FACTOR :	0.800	0.871	0.851	0.000	0.951	0.937	0.855	0.000	0.729	0.894	0.865	0.000	0.914	0.892	0.884	0.000	0.968
	0.863				0.942				0.886				0.927				

Prepared by National Data & Surveying Services

Atlantic Ave & E South St

Peak Hour Turning Movement Count

ID: 21-020061-002
City: Long Beach

Day: Wednesday
Date: 3/10/2021

PEAK HOURS		COUNT PERIODS
07:45 AM - 08:45 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	4:00 PM - 06:00 PM

Atlantic Ave

SOUTHBOUND

AM	47	441	86	0	425
NOON	0	0	0	0	0
PM	65	551	194	0	814
	↲	↓	↳	↶	⇧
	1	2	1	0	

E South St

EASTBOUND

	AM	NOON	PM		
⇦	164	0	270		
↶	0	0	0	0	
↰	59	0	70	1	
→	120	0	211	2	
↴	36	0	45	0	
	AM	NOON	PM		

E South St

WESTBOUND

		PM	NOON	AM
0	↰	145	0	94
2	←	157	0	92
1	↲	128	0	100
0	↶	0	0	0
	⇨	531	0	271
		PM	NOON	AM

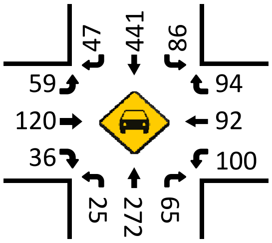
CONTROL			
Signalized			
TEV	1437	0	2339
	AM	NOON	PM
PHF	0.98		0.97

NORTHBOUND

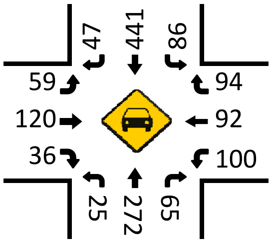
Atlantic Ave

		0	1	2	0	
	⇩	↶	↰	↑	↱	
PM	724	0	48	599	126	PM
NOON	0	0	0	0	0	NOON
AM	577	0	25	272	65	AM

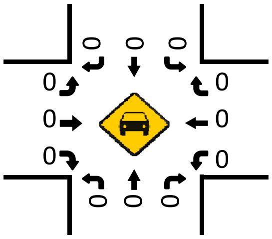
Totals (AM)



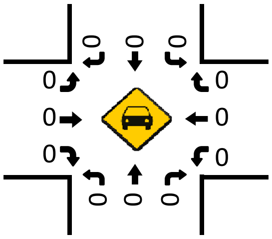
Totals (AM)



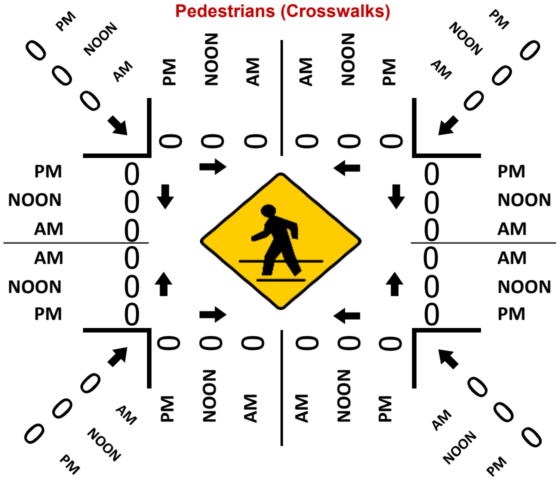
Totals (NOON)



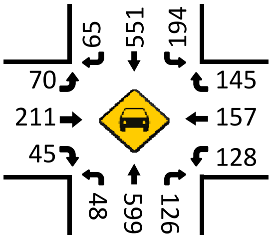
Totals (NOON)



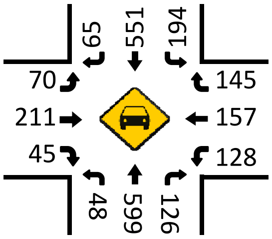
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



Location: Atlantic Ave & E South St
City: Long Beach
Control: Signalized

Project ID: 19-05675-009
Date: 11/6/2019

Total

NS/EW Streets:	Atlantic Ave				Atlantic Ave				E South St				E South St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	79	13	0	20	123	9	0	12	36	8	0	38	38	33	0	409
7:15 AM	1	119	21	0	37	151	16	0	20	58	11	0	37	45	45	0	561
7:30 AM	5	119	26	1	39	225	22	0	30	47	14	0	57	73	43	1	702
7:45 AM	7	82	33	0	40	191	18	0	10	54	15	0	50	106	53	0	659
8:00 AM	21	114	17	0	35	137	15	0	12	50	11	0	44	94	53	0	603
8:15 AM	13	73	20	1	26	161	13	0	16	44	10	0	33	66	28	0	504
8:30 AM	2	105	19	0	31	139	20	0	15	34	18	0	32	63	29	0	507
8:45 AM	4	103	30	0	26	150	17	0	21	37	13	0	32	46	26	0	505
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	53	794	179	2	254	1277	130	0	136	360	100	0	323	531	310	1	4450
APPROACH %'s :	5.16%	77.24%	17.41%	0.19%	15.29%	76.88%	7.83%	0.00%	22.82%	60.40%	16.78%	0.00%	27.73%	45.58%	26.61%	0.09%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	34	434	97	1	151	704	71	0	72	209	51	0	188	318	194	1	2525
PEAK HR FACTOR :	0.405	0.912	0.735	0.250	0.944	0.782	0.807	0.000	0.600	0.901	0.850	0.000	0.825	0.750	0.915	0.250	0.899
	0.931				0.809				0.912				0.839				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	13	79	18	0	34	93	12	1	10	36	8	0	39	31	25	0	399
11:15 AM	7	100	21	0	24	115	13	0	12	23	6	0	32	32	28	0	413
11:30 AM	8	112	14	0	30	90	10	0	14	38	5	0	32	36	31	0	420
11:45 AM	9	85	26	0	27	109	14	0	18	35	13	0	33	38	17	0	424
12:00 PM	8	121	25	0	28	111	9	0	13	40	9	0	35	36	29	0	464
12:15 PM	11	121	22	0	31	91	14	0	12	41	12	0	32	34	19	0	440
12:30 PM	6	105	25	0	28	117	16	0	17	48	10	0	31	38	29	0	470
12:45 PM	7	123	23	0	38	116	18	0	14	35	8	0	23	39	27	0	471
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	69	846	174	0	240	842	106	1	110	296	71	0	257	284	205	0	3501
APPROACH %'s :	6.34%	77.69%	15.98%	0.00%	20.19%	70.82%	8.92%	0.08%	23.06%	62.05%	14.88%	0.00%	34.45%	38.07%	27.48%	0.00%	
PEAK HR :	12:00 PM - 01:00 PM																TOTAL
PEAK HR VOL :	32	470	95	0	125	435	57	0	56	164	39	0	121	147	104	0	1845
PEAK HR FACTOR :	0.727	0.955	0.950	0.000	0.822	0.929	0.792	0.000	0.824	0.854	0.813	0.000	0.864	0.942	0.897	0.000	0.979
	0.969				0.897				0.863				0.930				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	17	187	35	0	55	132	19	0	33	99	7	0	39	71	31	0	725
4:15 PM	20	180	38	0	52	125	20	0	10	96	12	0	44	59	55	0	711
4:30 PM	22	171	37	1	66	121	17	0	18	113	9	0	36	63	38	0	712
4:45 PM	15	165	33	0	50	155	17	0	24	90	9	0	32	63	33	0	686
5:00 PM	22	195	28	0	61	161	27	0	26	84	11	0	41	68	34	0	758
5:15 PM	22	211	51	0	71	135	16	0	12	90	15	0	34	56	46	0	759
5:30 PM	22	165	48	0	67	165	13	0	19	89	6	0	43	65	50	0	752
5:45 PM	14	196	32	1	73	127	17	0	20	88	7	0	44	71	28	0	718
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	154	1470	302	2	495	1121	146	0	162	749	76	0	313	516	315	0	5821
APPROACH %'s :	7.99%	76.24%	15.66%	0.10%	28.09%	63.62%	8.29%	0.00%	16.41%	75.89%	7.70%	0.00%	27.36%	45.10%	27.53%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	80	767	159	1	272	588	73	0	77	351	39	0	162	260	158	0	2987
PEAK HR FACTOR :	0.909	0.909	0.779	0.250	0.932	0.891	0.676	0.000	0.740	0.975	0.650	0.000	0.920	0.915	0.790	0.000	0.984
	0.886				0.937				0.965				0.918				

Prepared by National Data & Surveying Services

Atlantic Ave & E South St

Peak Hour Turning Movement Count

ID: 19-05675-009
City: Long Beach

Day: Wednesday
Date: 11/06/2019

PEAK HOURS		COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	12:00 PM - 01:00 PM	11:00 AM - 01:00 PM
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Atlantic Ave

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	71	704	151	0	700
NOON	57	435	125	0	630
PM	73	588	272	0	1002
	1	2	1	0	

E South St

EASTBOUND

	AM	NOON	PM	
⇦	423	236	413	
↶	0	0	0	0
↰	72	56	77	1
→	209	164	351	2
↴	51	39	39	0

E South St

WESTBOUND

		PM	NOON	AM
0	↰	158	104	194
2	←	260	147	318
1	↱	162	121	188
0	↶	0	0	1
	⇨	782	384	458

CONTROL

Signalized

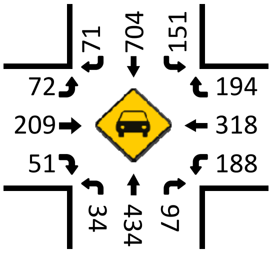
	AM	NOON	PM
TEV	2525	1845	2987
PHF	0.90	0.98	0.98

NORTHBOUND

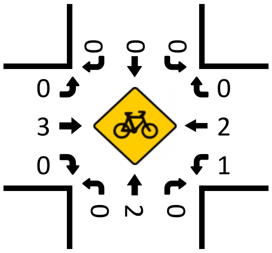
Atlantic Ave

	⇩	↶	↰	↑	↱
		0	1	2	0
PM	790	1	80	767	159
NOON	595	0	32	470	95
AM	944	1	34	434	97

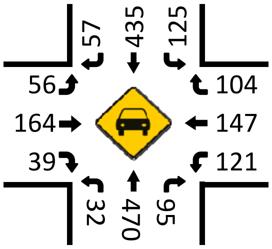
Total Vehicles (AM)



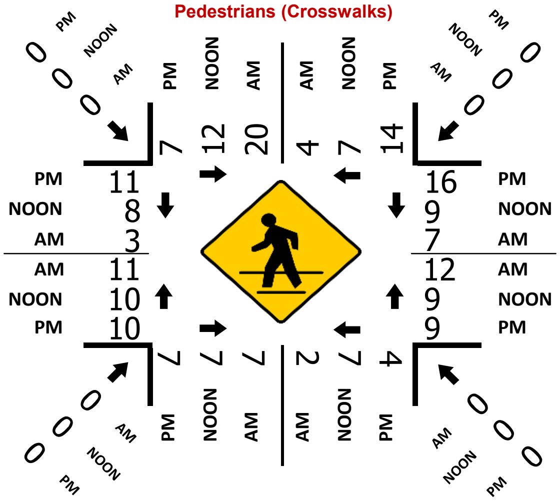
Bikes (AM)



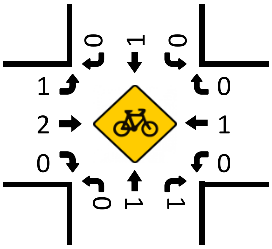
Total Vehicles (Noon)



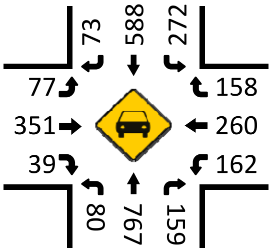
Pedestrians (Crosswalks)



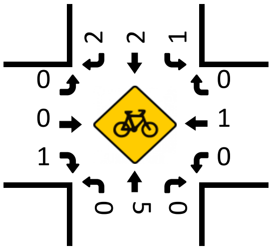
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Linden Ave & E 59th St
City: Long Beach
Control: 4-Way Stop

Project ID: 21-020061-003
Date: 3/10/2021

Data - Total

NS/EW Streets:	Linden Ave				Linden Ave				E 59th St				E 59th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	1	0	3	2	1	0	1	3	0	0	0	1	0	0	12
7:15 AM	0	1	1	0	3	3	1	0	0	2	0	0	1	1	1	0	14
7:30 AM	0	1	1	0	4	4	0	0	1	6	1	0	0	2	2	0	22
7:45 AM	1	0	4	0	8	1	0	0	1	3	0	2	0	0	2	0	22
8:00 AM	0	3	0	0	8	4	1	0	2	5	0	1	2	1	4	0	31
8:15 AM	2	1	5	1	3	2	0	0	1	2	0	0	1	0	1	0	19
8:30 AM	1	2	1	1	5	3	3	0	2	5	0	0	1	2	3	0	29
8:45 AM	1	1	1	0	9	0	0	0	0	1	3	0	4	3	1	0	24
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	9	14	2	43	19	6	0	8	27	4	3	9	10	14	0	173
APPROACH %'s :	16.67%	30.00%	46.67%	6.67%	63.24%	27.94%	8.82%	0.00%	19.05%	64.29%	9.52%	7.14%	27.27%	30.30%	42.42%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	4	7	7	2	25	9	4	0	5	13	3	1	8	6	9	0	103
PEAK HR FACTOR :	0.500	0.583	0.350	0.500	0.694	0.563	0.333	0.000	0.625	0.650	0.250	0.250	0.500	0.500	0.563	0.000	0.831
	0.556				0.731				0.688				0.719				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	8	3	0	4	4	3	0	0	0	0	0	0	4	6	0	33
4:15 PM	2	5	0	1	4	1	3	0	3	3	0	0	4	9	9	0	44
4:30 PM	1	2	3	0	5	5	1	0	3	4	0	0	4	4	10	0	42
4:45 PM	2	6	3	0	2	5	0	1	0	2	0	0	1	7	5	0	34
5:00 PM	0	5	3	0	8	0	0	1	1	2	0	0	3	2	7	0	32
5:15 PM	0	1	2	0	5	4	1	0	2	1	0	0	1	5	6	0	28
5:30 PM	2	3	1	0	8	4	1	0	0	2	2	0	2	4	4	0	33
5:45 PM	0	4	1	0	6	7	1	0	1	4	1	0	4	2	6	0	37
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	8	34	16	1	42	30	10	2	10	18	3	0	19	37	53	0	283
APPROACH %'s :	13.56%	57.63%	27.12%	1.69%	50.00%	35.71%	11.90%	2.38%	32.26%	58.06%	9.68%	0.00%	17.43%	33.94%	48.62%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	6	21	9	1	15	15	7	1	6	9	0	0	9	24	30	0	153
PEAK HR FACTOR :	0.750	0.656	0.750	0.250	0.750	0.750	0.583	0.250	0.500	0.563	0.000	0.000	0.563	0.667	0.750	0.000	0.869
	0.771				0.864				0.536				0.716				

Prepared by National Data & Surveying Services

Linden Ave & E 59th St

Peak Hour Turning Movement Count

ID: 21-020061-003
City: Long Beach

Day: Wednesday
Date: 3/10/2021

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	4:00 PM - 06:00 PM

Linden Ave

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	4	9	25	0	21
NOON	0	0	0	0	0
PM	7	15	15	1	58
	0	1	0	0	

E 59th St

EASTBOUND

	AM	NOON	PM	
⇦	15	0	37	
↶	1	0	0	0
↱	5	0	6	0
→	13	0	9	1
↴	3	0	0	0

E 59th St

WESTBOUND

		PM	NOON	AM
0	↰	30	0	9
1	←	24	0	6
0	↲	9	0	8
0	↶	0	0	0
	⇨	33	0	45

CONTROL

4-Way Stop

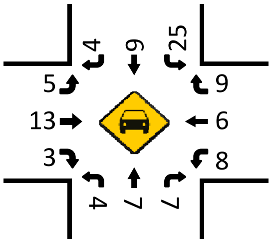
	AM	NOON	PM
TEV	103	0	153
PHF	0.83		0.87

NORTHBOUND

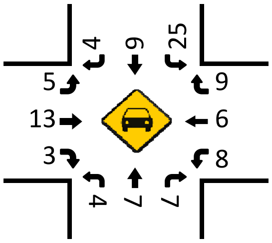
Linden Ave

	⇩	↶	↰	↑	↱
		0	0	1	0
PM	25	1	6	21	9
NOON	0	0	0	0	0
AM	22	2	4	7	7

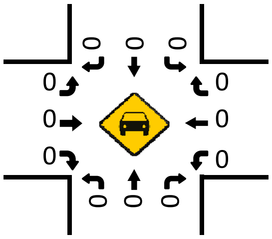
Totals (AM)



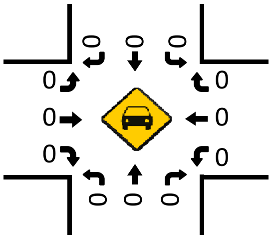
Totals (AM)



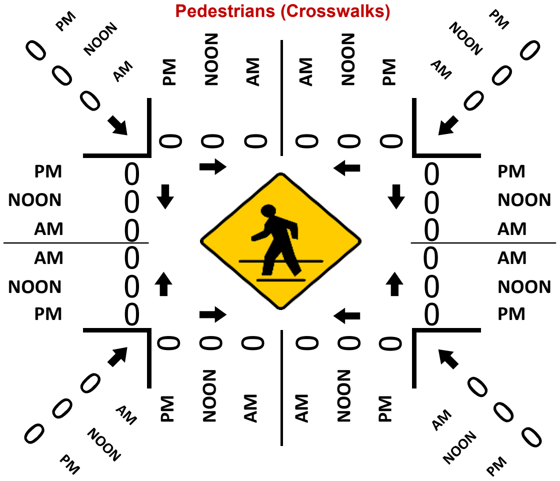
Totals (NOON)



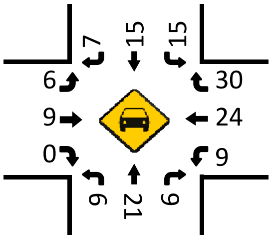
Totals (NOON)



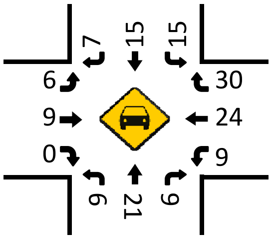
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Linden Ave & E Hullett St
City: Long Beach
Control: 1-Way Stop(EB)

Project ID: 21-020061-004
Date: 3/10/2021

Data - Total

NS/EW Streets:	Linden Ave				Linden Ave				E Hullett St				E Hullett St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	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	0	0	0	0	2	1	0	1	0	0	0	0	0	0	0	4
7:15 AM	0	0	0	0	0	3	1	0	1	0	1	0	0	0	0	0	6
7:30 AM	0	1	0	0	0	4	1	0	2	0	2	0	0	0	0	0	10
7:45 AM	0	1	0	0	0	3	1	1	2	0	0	1	0	0	0	0	9
8:00 AM	0	2	0	0	0	4	3	0	1	0	2	0	0	0	0	0	12
8:15 AM	0	2	0	0	0	1	0	0	6	0	0	0	0	0	0	0	9
8:30 AM	0	2	0	0	0	8	0	0	2	0	1	0	0	0	0	0	13
8:45 AM	1	1	0	1	0	2	5	0	3	0	1	0	0	0	0	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	9	0	1	0	27	12	1	18	0	7	1	0	0	0	0	77
APPROACH %'s :	9.09%	81.82%	0.00%	9.09%	0.00%	67.50%	30.00%	2.50%	69.23%	0.00%	26.92%	3.85%					
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	1	7	0	1	0	15	8	0	12	0	4	0	0	0	0	0	48
PEAK HR FACTOR :	0.250	0.875	0.000	0.250	0.000	0.469	0.400	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.857
	0.750				0.719				0.667								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	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	1	9	0	0	0	4	0	0	3	0	1	0	0	0	0	0	18
4:15 PM	1	8	0	0	0	2	1	0	0	0	0	0	0	0	0	0	12
4:30 PM	1	4	0	0	0	4	6	0	3	0	1	0	0	0	0	0	19
4:45 PM	0	4	0	0	0	5	0	0	6	0	0	0	0	0	0	0	15
5:00 PM	1	3	0	0	0	1	2	0	4	0	0	0	0	0	0	0	11
5:15 PM	2	1	0	0	0	4	1	0	2	0	0	0	0	0	0	0	10
5:30 PM	2	5	0	0	0	5	1	0	1	0	1	0	0	0	0	0	15
5:45 PM	0	5	0	0	0	9	4	0	2	0	1	0	0	0	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	8	39	0	0	0	34	15	0	21	0	4	0	0	0	0	0	121
APPROACH %'s :	17.02%	82.98%	0.00%	0.00%	0.00%	69.39%	30.61%	0.00%	84.00%	0.00%	16.00%	0.00%					
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	3	25	0	0	0	15	7	0	12	0	2	0	0	0	0	0	64
PEAK HR FACTOR :	0.750	0.694	0.000	0.000	0.000	0.750	0.292	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.842
	0.700				0.550				0.583								

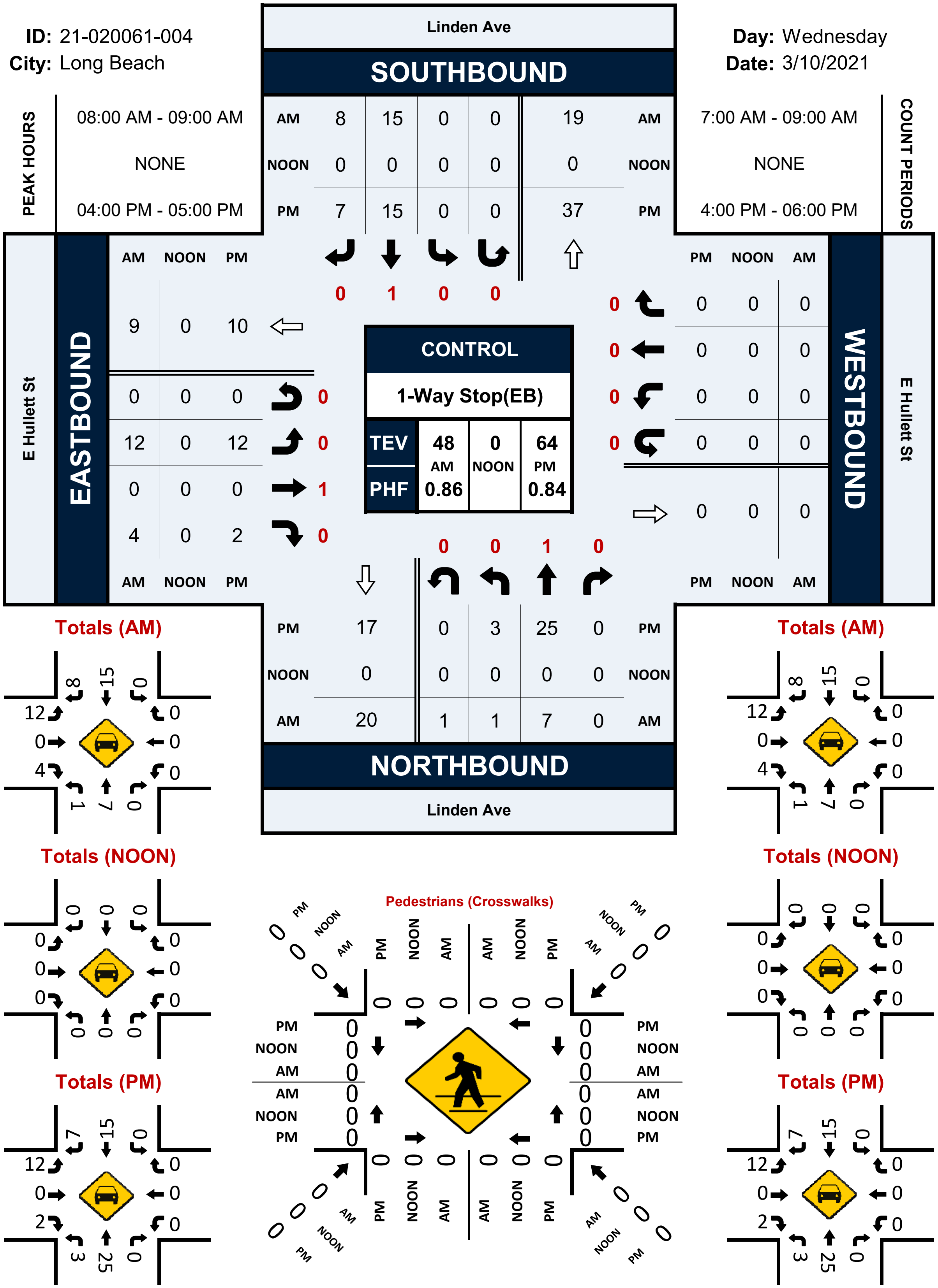
Prepared by National Data & Surveying Services

Linden Ave & E Hullett St

Peak Hour Turning Movement Count

ID: 21-020061-004
City: Long Beach

Day: Wednesday
Date: 3/10/2021



PEAK HOURS		COUNT PERIODS
08:00 AM - 09:00 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
04:00 PM - 05:00 PM	PM	4:00 PM - 06:00 PM

Linden Ave

SOUTHBOUND

	↲	↓	↳	↻	⇧
AM	8	15	0	0	19
NOON	0	0	0	0	0
PM	7	15	0	0	37
	0	1	0	0	

E Hullett St

EASTBOUND

	AM	NOON	PM	
⇦	9	0	10	
↻	0	0	0	0
↰	12	0	12	0
→	0	0	0	1
↴	4	0	2	0

E Hullett St

WESTBOUND

		PM	NOON	AM
↰	0	0	0	0
←	0	0	0	0
↙	0	0	0	0
↺	0	0	0	0
⇨		0	0	0

CONTROL

1-Way Stop(EB)

	AM	NOON	PM
TEV	48	0	64
PHF	0.86		0.84

NORTHBOUND

Linden Ave

		↺	↰	↑	↱
		0	0	1	0
PM	17	0	3	25	0
NOON	0	0	0	0	0
AM	20	1	1	7	0

Totals (AM)

	Left	Through	Right/U
SB	8	15	0
EB	12	0	4
WB	0	0	0
NB	1	7	0

Totals (NOON)

All movements: 0

Totals (PM)

SB	7	15	0
EB	12	0	2
WB	0	0	0
NB	3	25	0

Pedestrians (Crosswalks)

	AM	NOON	PM
North crosswalk	0	0	0
South crosswalk	0	0	0
East crosswalk	0	0	0
West crosswalk	0	0	0
Diagonals	0	0	0

National Data & Surveying Services

Intersection Turning Movement Count

Location: Linden Ave & E South St
City: Long Beach
Control: 2-Way Stop(NB/SB)

Project ID: 21-020061-005
Date: 3/10/2021

Data - Total

NS/EW Streets:	Linden Ave				Linden Ave				E South St				E South St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	1	0	0	0	1	0	0	2	0	0	0	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	7	0	0	0	3	0	0	33	0	0	0	23	0	0	66
7:15 AM	0	0	6	0	0	0	3	0	0	37	0	0	0	32	0	0	78
7:30 AM	0	0	6	0	0	0	9	0	0	41	0	0	0	42	1	0	99
7:45 AM	0	0	5	0	0	0	2	0	0	52	1	0	0	39	0	0	99
8:00 AM	0	0	12	0	0	0	8	0	0	42	4	0	0	38	2	0	106
8:15 AM	0	0	6	0	0	0	1	0	0	51	1	0	0	35	3	0	97
8:30 AM	0	0	5	0	0	0	9	0	0	41	0	0	0	47	1	0	103
8:45 AM	0	0	8	0	0	0	3	0	0	43	1	0	0	30	3	0	88
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	55	0	0	0	38	0	0	340	7	0	0	286	10	0	736
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	97.98%	2.02%	0.00%	0.00%	96.62%	3.38%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	0	28	0	0	0	20	0	0	186	6	0	0	159	6	0	405
PEAK HR FACTOR :	0.000	0.000	0.583	0.000	0.000	0.000	0.556	0.000	0.000	0.894	0.375	0.000	0.000	0.846	0.500	0.000	0.955
	0.583				0.556				0.906				0.859				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	1	0	0	0	1	0	0	2	0	0	0	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	12	0	0	0	5	0	0	65	1	0	0	58	9	0	150
4:15 PM	0	0	8	0	0	0	2	0	0	55	2	0	0	74	7	0	148
4:30 PM	0	0	9	0	0	0	4	0	0	72	1	0	0	74	5	0	165
4:45 PM	0	0	9	0	0	0	5	0	0	84	0	0	0	72	5	0	175
5:00 PM	0	0	6	0	0	0	2	0	0	64	3	0	0	61	4	0	140
5:15 PM	0	0	6	0	0	0	5	0	0	68	2	0	0	63	2	0	146
5:30 PM	0	0	10	0	0	0	4	0	0	78	2	0	0	61	9	0	164
5:45 PM	0	0	9	0	0	0	8	0	0	59	2	0	0	65	5	0	148
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	69	0	0	0	35	0	0	545	13	0	0	528	46	0	1236
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	97.67%	2.33%	0.00%	0.00%	91.99%	8.01%	0.00%	
PEAK HR :	**04:00 PM - 05:00 PM**																TOTAL
PEAK HR VOL :	0	0	38	0	0	0	16	0	0	276	4	0	0	278	26	0	638
PEAK HR FACTOR :	0.000	0.000	0.792	0.000	0.000	0.000	0.800	0.000	0.000	0.821	0.500	0.000	0.000	0.939	0.722	0.000	0.911
	0.792				0.800				0.833				0.938				

Prepared by National Data & Surveying Services

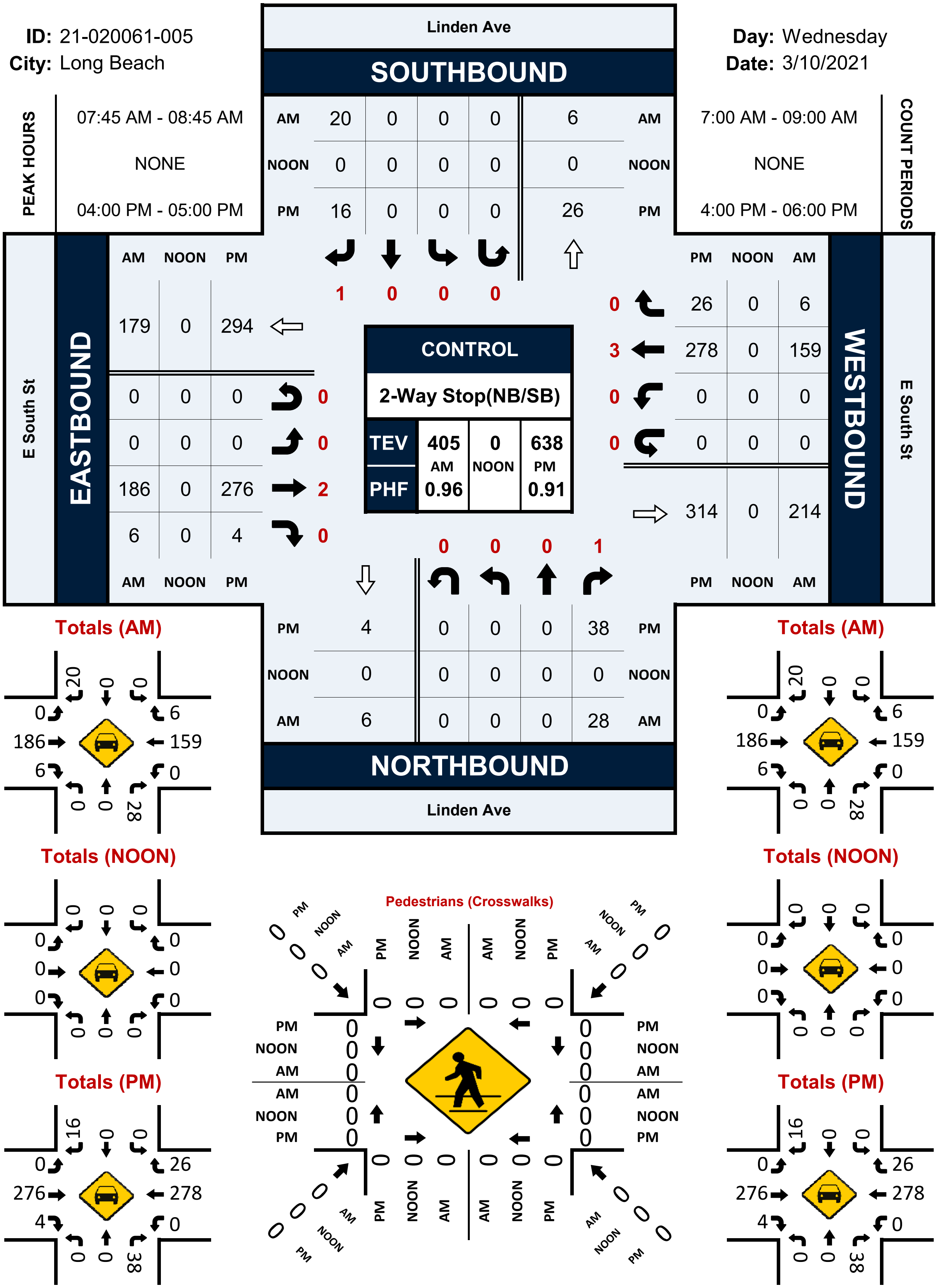
Linden Ave & E South St

Peak Hour Turning Movement Count

ID: 21-020061-005
City: Long Beach

Day: Wednesday
Date: 3/10/2021

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	4:00 PM - 06:00 PM



SOUTHBOUND (Linden Ave)

	↲	↓	↳	⤿	⇧
AM	20	0	0	0	6
NOON	0	0	0	0	0
PM	16	0	0	0	26
	1	0	0	0	

EASTBOUND (E South St)

	AM	NOON	PM	
⇦	179	0	294	
⤾	0	0	0	0
⬏	0	0	0	0
➡	186	0	276	2
⬎	6	0	4	0

WESTBOUND (E South St)

		PM	NOON	AM
0	⬑	26	0	6
3	⬅	278	0	159
0	⬐	0	0	0
0	⤿	0	0	0
	⇨	314	0	214

NORTHBOUND (Linden Ave)

	⇩	⤺	↰	⬆	↱
		0	0	0	1
PM	4	0	0	0	38
NOON	0	0	0	0	0
AM	6	0	0	0	28

CONTROL

2-Way Stop(NB/SB)

	AM	NOON	PM
TEV	405	0	638
PHF	0.96		0.91

Totals (AM)

SB	20, 0, 0
WB	6, 159, 0
EB	0, 186, 6
NB	0, 0, 28

Totals (NOON)

SB	0, 0, 0
WB	0, 0, 0
EB	0, 0, 0
NB	0, 0, 0

Totals (PM)

SB	16, 0, 0
WB	26, 278, 0
EB	0, 276, 4
NB	0, 0, 38

Pedestrians (Crosswalks)

	PM	NOON	AM
North crosswalk (west side)	0	0	0
North crosswalk (east side)	0	0	0
West crosswalk	0	0	0
East crosswalk	0	0	0
South crosswalk	0	0	0
Diagonals	0	0	0

APPENDIX C

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX C-I

EXISTING TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type: Signalized
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 5.1
Level Of Service: A
Volume to Capacity (v/c): 0.360

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	21	668	7	12	884	10	22	0	56	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	668	7	12	884	10	22	0	56	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	190	2	3	258	3	6	0	16	3	1	8
Total Analysis Volume [veh/h]	24	758	8	14	1030	12	25	0	63	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.21	0.02	0.28	0.28	0.05	0.03
s, saturation flow rate [veh/h]	541	1870	1863	701	1870	1862	1705	1750
c, Capacity [veh/h]	489	1597	1591	626	1597	1591	159	161
d1, Uniform Delay [s]	2.75	1.34	1.34	2.25	1.48	1.48	45.91	44.89
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.36	0.36	0.07	0.55	0.55	3.02	1.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.24	0.24	0.02	0.33	0.33	0.56	0.30
d, Delay for Lane Group [s/veh]	2.94	1.69	1.70	2.32	2.02	2.02	48.92	45.91
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.11	0.71	0.71	0.05	1.08	1.07	2.29	1.20
50th-Percentile Queue Length [ft/ln]	2.82	17.85	17.80	1.33	26.91	26.83	57.23	29.92
95th-Percentile Queue Length [veh/ln]	0.20	1.28	1.28	0.10	1.94	1.93	4.12	2.15
95th-Percentile Queue Length [ft/ln]	5.08	32.12	32.04	2.40	48.44	48.29	103.01	53.85

Movement, Approach, & Intersection Results

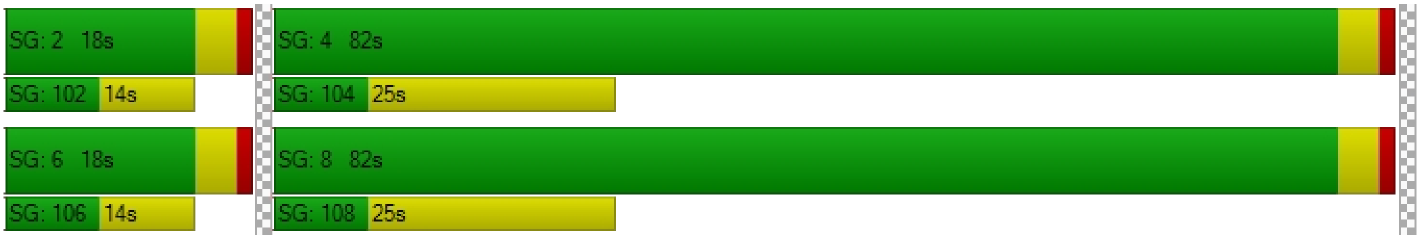
d_M, Delay for Movement [s/veh]	2.94	1.69	1.70	2.32	2.02	2.02	48.92	48.92	48.92	45.91	45.91	45.91
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.73			2.03			48.92			45.91		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.05											
Intersection LOS	A											
Intersection V/C	0.360											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.693	2.705	1.805	1.768
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.211	2.431	1.705	1.639
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.517

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	35	437	98	152	710	72	73	211	51	191	321	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	437	98	152	710	72	73	211	51	191	321	196
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	117	26	47	219	22	20	58	14	57	96	58
Total Analysis Volume [veh/h]	38	469	105	188	878	89	80	231	56	228	383	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	10	39	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	50	50	60	60	60	32	32	32	32	32	32
g / C, Green / Cycle	0.50	0.50	0.50	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.16	0.19	0.25	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	632	1870	1754	964	3560	1589	806	1870	1747	1092	1870	1636
c, Capacity [veh/h]	290	934	876	604	2135	953	199	599	560	338	599	524
d1, Uniform Delay [s]	22.84	14.87	14.89	9.58	10.64	8.49	39.36	25.06	25.12	36.18	28.02	28.04
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	0.89	0.96	1.34	0.59	0.19	1.30	0.21	0.23	2.35	0.79	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.13	0.32	0.32	0.31	0.41	0.09	0.40	0.24	0.25	0.68	0.55	0.55
d, Delay for Lane Group [s/veh]	23.78	15.75	15.85	10.92	11.22	8.68	40.66	25.27	25.35	38.53	28.81	28.94
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.69	4.09	3.89	1.96	4.98	0.83	1.89	2.58	2.48	5.44	6.51	5.73
50th-Percentile Queue Length [ft/ln]	17.37	102.26	97.25	48.94	124.44	20.72	47.32	64.42	61.96	136.11	162.73	143.13
95th-Percentile Queue Length [veh/ln]	1.25	7.36	7.00	3.52	8.64	1.49	3.41	4.64	4.46	9.27	10.69	9.65
95th-Percentile Queue Length [ft/ln]	31.27	184.06	175.05	88.10	215.91	37.29	85.17	115.96	111.54	231.78	267.34	241.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.78	15.79	15.85	10.92	11.22	8.68	40.66	25.30	25.35	38.53	28.83	28.94
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	16.29			10.98			28.66			31.48		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.06											
Intersection LOS	C											
Intersection V/C	0.517											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.975	2.886	2.530	2.711
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	700	1140	1140
d_b, Bicycle Delay [s]	28.13	21.13	9.25	9.25
I_b,int, Bicycle LOS Score for Intersection	2.065	2.512	1.862	2.257
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type: All-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 7.5
Level Of Service: A
Volume to Capacity (v/c): 0.106

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	├		┤		┬	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	22	34	42	22	24	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	34	42	22	24	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	15	14	8	8	5
Total Analysis Volume [veh/h]	40	61	57	30	33	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	952	842	854
Degree of Utilization, x	0.11	0.10	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.35	0.34	0.20
95th-Percentile Queue Length [ft]	8.87	8.61	5.05
Approach Delay [s/veh]	7.23	7.77	7.50
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.48		
Intersection LOS	A		

Intersection Level Of Service Report

Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	10	24	29	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	24	29	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	11	10	6	12	2
Total Analysis Volume [veh/h]	18	43	40	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	0.00	9.49	8.81
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.20	0.20
95th-Percentile Queue Length [ft/ln]	0.89	0.89	0.00	0.00	4.95	4.95
d_A, Approach Delay [s/veh]	2.17		0.00		9.40	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.60					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		↔	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	3	12	25	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	12	25	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	9	5	7	3
Total Analysis Volume [veh/h]	4	16	35	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	0.00	9.02	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.19	0.19	0.00	0.00	3.27	3.27
d_A, Approach Delay [s/veh]	1.47		0.00		8.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.39					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.118

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	34	0	318	10	0	272	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	34	0	318	10	0	272	10
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	20	0	0	15	0	88	3	0	79	3
Total Analysis Volume [veh/h]	0	0	81	0	0	61	0	351	11	0	317	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.93	0.00	0.00	10.48	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.40	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	9.96	0.00	0.00	6.94	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.93			10.48			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.83											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	4.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	32	980	27	39	875	28	12	1	49	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	980	27	39	875	28	12	1	49	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	266	7	10	229	7	4	0	17	6	1	9
Total Analysis Volume [veh/h]	35	1064	29	41	917	29	16	1	66	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	6	6
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.29	0.08	0.25	0.25	0.05	0.04
s, saturation flow rate [veh/h]	593	1870	1853	516	1870	1850	1744	1690
c, Capacity [veh/h]	536	1605	1590	470	1605	1587	151	154
d1, Uniform Delay [s]	2.50	1.42	1.42	2.82	1.35	1.35	46.20	45.59
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	0.58	0.59	0.37	0.47	0.48	3.11	1.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.34	0.34	0.09	0.30	0.30	0.55	0.39
d, Delay for Lane Group [s/veh]	2.74	2.01	2.01	3.18	1.82	1.83	49.31	47.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.15	1.07	1.07	0.20	0.88	0.87	2.17	1.52
50th-Percentile Queue Length [ft/ln]	3.79	26.83	26.65	5.01	21.95	21.77	54.21	38.11
95th-Percentile Queue Length [veh/ln]	0.27	1.93	1.92	0.36	1.58	1.57	3.90	2.74
95th-Percentile Queue Length [ft/ln]	6.81	48.29	47.97	9.02	39.51	39.19	97.58	68.60

Movement, Approach, & Intersection Results

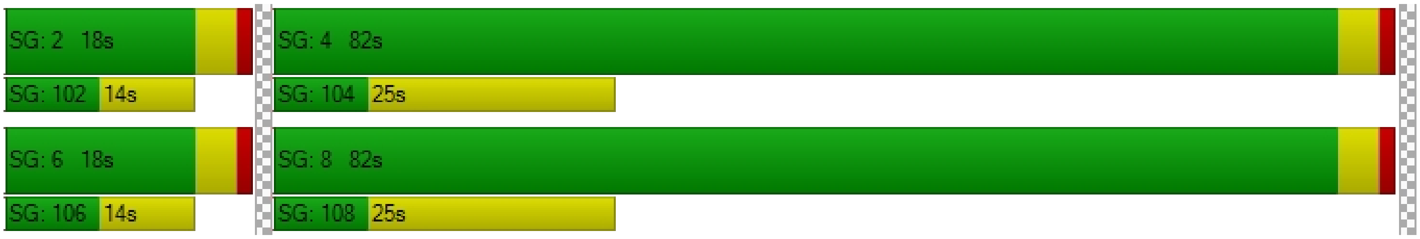
d_M, Delay for Movement [s/veh]	2.74	2.01	2.01	3.18	1.82	1.83	49.31	49.31	49.31	47.20	47.20	47.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.03			1.88			49.31			47.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.90											
Intersection LOS	A											
Intersection V/C	0.371											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.752	2.737	1.830	1.831
Crosswalk LOS	C	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.490	2.374	1.697	1.659
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	82	773	160	274	593	74	78	354	39	163	262	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	773	160	274	593	74	78	354	39	163	262	159
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	218	45	73	158	20	20	92	10	44	71	43
Total Analysis Volume [veh/h]	93	872	181	292	633	79	81	367	40	178	285	173
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	14	59	0	0	41	0	0	41	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47	47	61	61	61	31	31	31	31	31	31
g / C, Green / Cycle	0.47	0.47	0.47	0.61	0.61	0.61	0.31	0.31	0.31	0.31	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.12	0.29	0.29	0.38	0.18	0.05	0.09	0.11	0.11	0.18	0.13	0.13
s, saturation flow rate [veh/h]	794	1870	1760	778	3560	1589	933	1870	1806	978	1870	1638
c, Capacity [veh/h]	359	876	824	461	2159	964	251	587	567	277	587	514
d1, Uniform Delay [s]	23.12	19.90	19.92	14.61	9.43	8.16	35.80	26.47	26.49	38.20	27.06	27.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.75	3.28	3.49	6.48	0.35	0.17	0.74	0.36	0.38	2.49	0.47	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.26	0.62	0.62	0.63	0.29	0.08	0.32	0.35	0.35	0.64	0.41	0.42
d, Delay for Lane Group [s/veh]	24.87	23.18	23.41	21.09	9.77	8.32	36.54	26.82	26.87	40.69	27.52	27.66
Lane Group LOS	C	C	C	C	A	A	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.74	9.85	9.34	3.64	3.20	0.71	1.79	3.81	3.72	4.35	4.59	4.10
50th-Percentile Queue Length [ft/ln]	43.43	246.18	233.50	90.91	79.91	17.81	44.74	95.28	92.98	108.66	114.69	102.47
95th-Percentile Queue Length [veh/ln]	3.13	14.99	14.35	6.55	5.75	1.28	3.22	6.86	6.69	7.77	8.10	7.38
95th-Percentile Queue Length [ft/ln]	78.17	374.84	358.80	163.63	143.84	32.07	80.54	171.51	167.37	194.14	202.51	184.44

Movement, Approach, & Intersection Results

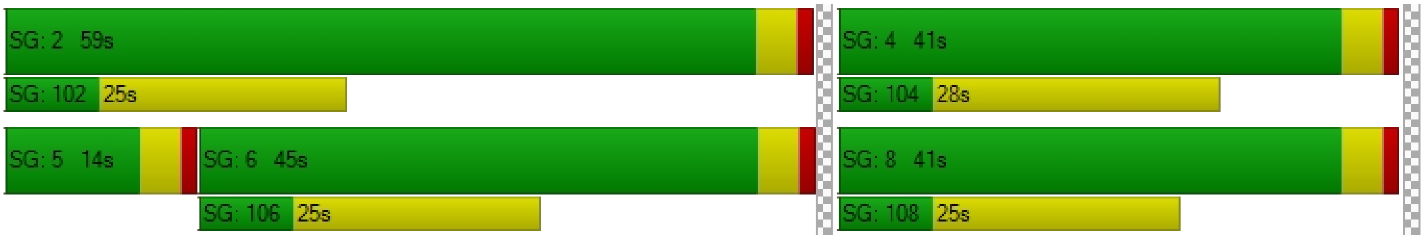
d_M, Delay for Movement [s/veh]	24.87	23.27	23.41	21.09	9.77	8.32	36.54	26.84	26.87	40.69	27.54	27.66
Movement LOS	C	C	C	C	A	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	23.42			12.95			28.46			31.26		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.48											
Intersection LOS	C											
Intersection V/C	0.632											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.947	2.919	2.621	2.796
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	820	1100	740	740
d_b, Bicycle Delay [s]	17.41	10.13	19.85	19.85
I_b,int, Bicycle LOS Score for Intersection	2.505	2.388	1.962	2.084
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.122

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	34	22	20	27	41	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	22	20	27	41	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	7	6	8	14	13
Total Analysis Volume [veh/h]	44	29	23	31	57	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	903	832	894
Degree of Utilization, x	0.08	0.06	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.21	0.41
95th-Percentile Queue Length [ft]	6.58	5.19	10.36
Approach Delay [s/veh]	7.34	7.63	7.58
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.52		
Intersection LOS	A		

Intersection Level Of Service Report

Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	9	37	30	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	37	30	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	12	9	11	9	0
Total Analysis Volume [veh/h]	12	48	35	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.38	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.60	0.60	0.00	0.00	3.19	3.19
d_A, Approach Delay [s/veh]	1.48		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		↔	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	4	31	19	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	31	19	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	11	9	4	6	1
Total Analysis Volume [veh/h]	6	44	35	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.32	0.00	0.00	0.00	9.15	8.63
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.47	2.47
d_A, Approach Delay [s/veh]	0.88		0.00		9.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.37					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.093

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	20	0	346	5	0	349	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	20	0	346	5	0	349	32
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	104	2	0	93	9
Total Analysis Volume [veh/h]	0	0	59	0	0	25	0	415	6	0	372	34
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.09	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.25	0.00	0.00	10.68	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.31	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	7.65	0.00	0.00	2.95	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.25			10.68			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.02											
Intersection LOS	B											

APPENDIX C-II

EXISTING WITH "COMPLETE STREETS" IMPROVEMENTS TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			↰↑↱			↰↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	21	534	7	12	707	10	22	0	56	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	534	7	12	707	10	22	0	56	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	152	2	3	206	3	6	0	16	3	1	8
Total Analysis Volume [veh/h]	24	606	8	14	824	12	25	0	63	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	90	90	90	90	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.02	0.45	0.05	0.03
s, saturation flow rate [veh/h]	657	1866	808	1865	1702	1738
c, Capacity [veh/h]	539	1601	685	1601	156	158
d1, Uniform Delay [s]	4.39	1.58	3.01	1.91	48.22	47.15
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.70	0.05	1.22	3.19	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.38	0.02	0.52	0.56	0.30
d, Delay for Lane Group [s/veh]	4.55	2.27	3.07	3.14	51.40	48.22
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.16	1.44	0.07	2.42	2.41	1.26
50th-Percentile Queue Length [ft/ln]	3.93	36.10	1.70	60.51	60.37	31.56
95th-Percentile Queue Length [veh/ln]	0.28	2.60	0.12	4.36	4.35	2.27
95th-Percentile Queue Length [ft/ln]	7.08	64.97	3.05	108.91	108.66	56.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.55	2.27	2.27	3.07	3.14	3.14	51.40	51.40	51.40	48.22	48.22	48.22
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.36			3.14			51.40			48.22		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.78											
Intersection LOS	A											
Intersection V/C	0.541											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.532	2.543	1.808	1.770
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	2.612	2.962	1.705	1.639
Bicycle LOS	B	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	35	350	98	152	568	72	73	211	51	191	321	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	350	98	152	568	72	73	211	51	191	321	196
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	94	26	47	176	22	20	58	14	57	96	58
Total Analysis Volume [veh/h]	38	376	105	188	702	89	80	231	56	228	383	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	51	0	10	61	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	54	54	54	64	64	64	33	33	33	33	33	33
g / C, Green / Cycle	0.51	0.51	0.51	0.61	0.61	0.61	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.05	0.20	0.07	0.17	0.38	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	745	1870	1589	1104	1870	1589	806	1870	1747	1092	1870	1636
c, Capacity [veh/h]	258	958	815	647	1137	966	192	591	552	329	591	517
d1, Uniform Delay [s]	30.79	15.61	13.36	10.05	12.92	8.55	41.84	26.66	26.72	38.44	29.81	29.82
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.13	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.20	1.21	0.33	1.14	2.52	0.19	1.45	0.22	0.24	3.01	0.82	0.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.39	0.13	0.29	0.62	0.09	0.42	0.25	0.25	0.69	0.56	0.56
d, Delay for Lane Group [s/veh]	32.00	16.82	13.68	11.18	15.44	8.74	43.29	26.87	26.96	41.46	30.63	30.77
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.84	5.64	1.35	2.00	10.38	0.85	2.02	2.75	2.65	5.85	6.95	6.12
50th-Percentile Queue Length [ft/ln]	21.03	141.08	33.63	49.92	259.52	21.37	50.45	68.82	66.20	146.23	173.84	152.89
95th-Percentile Queue Length [veh/ln]	1.51	9.54	2.42	3.59	15.66	1.54	3.63	4.96	4.77	9.82	11.28	10.17
95th-Percentile Queue Length [ft/ln]	37.85	238.47	60.53	89.85	391.61	38.46	90.80	123.88	119.15	245.39	281.96	254.28

Movement, Approach, & Intersection Results

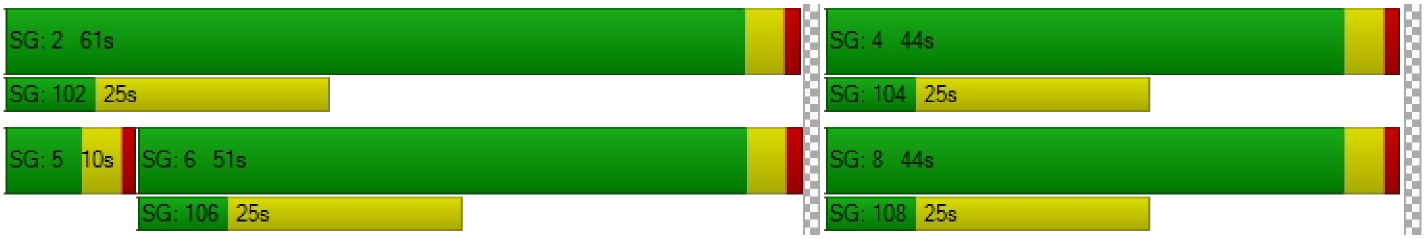
d_M, Delay for Movement [s/veh]	32.00	16.82	13.68	11.18	15.44	8.74	43.29	26.90	26.96	41.46	30.65	30.77
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	17.30			14.02			30.48			33.60		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	22.98											
Intersection LOS	C											
Intersection V/C	0.660											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.925	2.746	2.532	2.716
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	895	1086	762	762
d_b, Bicycle Delay [s]	16.02	10.97	20.12	20.12
I_b,int, Bicycle LOS Score for Intersection	2.416	3.175	1.862	2.257
Bicycle LOS	B	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	22	34	42	22	24	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	34	42	22	24	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	15	14	8	8	5
Total Analysis Volume [veh/h]	40	61	57	30	33	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	952	842	854
Degree of Utilization, x	0.11	0.10	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.35	0.34	0.20
95th-Percentile Queue Length [ft]	8.87	8.61	5.05
Approach Delay [s/veh]	7.23	7.77	7.50
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.48		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	10	24	29	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	24	29	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	11	10	6	12	2
Total Analysis Volume [veh/h]	18	43	40	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	0.00	9.49	8.81
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.20	0.20
95th-Percentile Queue Length [ft/ln]	0.89	0.89	0.00	0.00	4.95	4.95
d_A, Approach Delay [s/veh]	2.17		0.00		9.40	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.60					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	3	12	25	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	12	25	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	9	5	7	3
Total Analysis Volume [veh/h]	4	16	35	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	0.00	9.02	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.19	0.19	0.00	0.00	3.27	3.27
d_A, Approach Delay [s/veh]	1.47		0.00		8.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.39					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.118

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	34	0	318	10	0	272	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	34	0	318	10	0	272	10
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	20	0	0	15	0	88	3	0	79	3
Total Analysis Volume [veh/h]	0	0	81	0	0	61	0	351	11	0	317	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.93	0.00	0.00	10.48	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.40	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	9.96	0.00	0.00	6.94	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.93			10.48			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.83											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	6.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	32	784	27	39	700	28	12	1	49	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	784	27	39	700	28	12	1	49	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	213	7	10	183	7	4	0	17	6	1	9
Total Analysis Volume [veh/h]	35	851	29	41	734	29	16	1	66	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	91	91	91	91	6	6
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.05	0.47	0.07	0.41	0.05	0.04
s, saturation flow rate [veh/h]	703	1859	631	1858	1741	1671
c, Capacity [veh/h]	589	1603	517	1601	148	150
d1, Uniform Delay [s]	3.75	1.89	4.68	1.69	48.53	47.90
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	1.36	0.30	1.02	3.28	1.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.55	0.08	0.48	0.56	0.40
d, Delay for Lane Group [s/veh]	3.94	3.25	4.98	2.71	51.81	49.62
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.20	2.49	0.29	1.91	2.29	1.61
50th-Percentile Queue Length [ft/ln]	5.12	62.17	7.14	47.79	57.18	40.23
95th-Percentile Queue Length [veh/ln]	0.37	4.48	0.51	3.44	4.12	2.90
95th-Percentile Queue Length [ft/ln]	9.22	111.91	12.85	86.03	102.93	72.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.94	3.25	3.25	4.98	2.71	2.71	51.81	51.81	51.81	49.62	49.62	49.62
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.28			2.83			51.81			49.62		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.74											
Intersection LOS	A											
Intersection V/C	0.564											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.593	2.577	1.833	1.834
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	3.069	2.886	1.697	1.659
Bicycle LOS	C	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.708

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	82	618	160	274	474	74	78	354	39	163	262	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	618	160	274	474	74	78	354	39	163	262	159
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	174	45	73	126	20	20	92	10	44	71	43
Total Analysis Volume [veh/h]	93	698	181	292	506	79	81	367	40	178	285	173
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	61	0	10	71	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	57	57	67	67	67	30	30	30	30	30	30
g / C, Green / Cycle	0.54	0.54	0.54	0.64	0.64	0.64	0.29	0.29	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.10	0.37	0.11	0.33	0.27	0.05	0.09	0.11	0.11	0.18	0.13	0.13
s, saturation flow rate [veh/h]	893	1870	1589	872	1870	1589	933	1870	1806	978	1870	1638
c, Capacity [veh/h]	413	1013	861	451	1193	1014	217	534	516	242	534	468
d1, Uniform Delay [s]	22.12	17.58	12.43	14.93	9.43	7.24	40.69	30.10	30.13	43.41	30.77	30.84
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.18	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.26	3.83	0.56	7.05	1.11	0.15	1.07	0.46	0.48	7.16	0.60	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.69	0.21	0.65	0.42	0.08	0.37	0.39	0.39	0.74	0.45	0.46
d, Delay for Lane Group [s/veh]	23.38	21.40	12.99	21.98	10.53	7.39	41.76	30.55	30.61	50.57	31.37	31.55
Lane Group LOS	C	C	B	C	B	A	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.70	12.73	2.27	3.56	5.69	0.68	1.99	4.23	4.12	5.07	5.09	4.55
50th-Percentile Queue Length [ft/ln]	42.61	318.23	56.75	89.03	142.21	17.00	49.63	105.65	103.11	126.86	127.22	113.68
95th-Percentile Queue Length [veh/ln]	3.07	18.58	4.09	6.41	9.60	1.22	3.57	7.60	7.42	8.77	8.79	8.04
95th-Percentile Queue Length [ft/ln]	76.69	464.50	102.14	160.25	239.99	30.60	89.33	189.94	185.59	219.21	219.71	201.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.38	21.40	12.99	21.98	10.53	7.39	41.76	30.58	30.61	50.57	31.40	31.55
Movement LOS	C	C	B	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	20.03			14.06			32.44			36.80		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	23.89											
Intersection LOS	C											
Intersection V/C	0.708											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.891	2.779	2.624	2.828
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1086	1276	571	571
d_b, Bicycle Delay [s]	10.97	6.88	26.79	26.79
I_b,int, Bicycle LOS Score for Intersection	3.163	3.007	1.962	2.084
Bicycle LOS	C	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.122

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	⊢		⊣		⊤	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	34	22	20	27	41	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	22	20	27	41	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	7	6	8	14	13
Total Analysis Volume [veh/h]	44	29	23	31	57	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	903	832	894
Degree of Utilization, x	0.08	0.06	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.21	0.41
95th-Percentile Queue Length [ft]	6.58	5.19	10.36
Approach Delay [s/veh]	7.34	7.63	7.58
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.52		
Intersection LOS	A		

Intersection Level Of Service Report

Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		⊤	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	9	37	30	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	37	30	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	12	9	11	9	0
Total Analysis Volume [veh/h]	12	48	35	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.38	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.60	0.60	0.00	0.00	3.19	3.19
d_A, Approach Delay [s/veh]	1.48		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰↑		↑↱		↰↱	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	4	31	19	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	31	19	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	11	9	4	6	1
Total Analysis Volume [veh/h]	6	44	35	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.32	0.00	0.00	0.00	9.15	8.63
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.47	2.47
d_A, Approach Delay [s/veh]	0.88		0.00		9.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.37					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.093

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	20	0	346	5	0	349	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	20	0	346	5	0	349	32
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	104	2	0	93	9
Total Analysis Volume [veh/h]	0	0	59	0	0	25	0	415	6	0	372	34
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.09	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.25	0.00	0.00	10.68	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.31	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	7.65	0.00	0.00	2.95	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.25			10.68			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.02											
Intersection LOS	B											

APPENDIX C-III

EXISTING PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	5.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.375

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	21	668	7	12	884	19	37	0	56	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	668	7	12	884	19	37	0	56	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	190	2	3	258	6	10	0	16	3	1	8
Total Analysis Volume [veh/h]	24	758	8	14	1030	22	42	0	63	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	8	8
g / C, Green / Cycle	0.84	0.84	0.84	0.84	0.84	0.84	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.21	0.02	0.28	0.28	0.06	0.03
s, saturation flow rate [veh/h]	536	1870	1863	701	1870	1856	1671	1725
c, Capacity [veh/h]	476	1573	1568	615	1573	1562	182	181
d1, Uniform Delay [s]	3.20	1.58	1.58	2.60	1.75	1.75	45.11	43.68
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.37	0.37	0.07	0.58	0.58	2.89	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.24	0.24	0.02	0.34	0.34	0.58	0.26
d, Delay for Lane Group [s/veh]	3.40	1.95	1.95	2.66	2.33	2.33	47.99	44.45
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.13	0.89	0.89	0.06	1.36	1.35	2.71	1.17
50th-Percentile Queue Length [ft/ln]	3.16	22.19	22.13	1.49	33.98	33.78	67.70	29.32
95th-Percentile Queue Length [veh/ln]	0.23	1.60	1.59	0.11	2.45	2.43	4.87	2.11
95th-Percentile Queue Length [ft/ln]	5.69	39.94	39.83	2.69	61.16	60.80	121.85	52.77

Movement, Approach, & Intersection Results

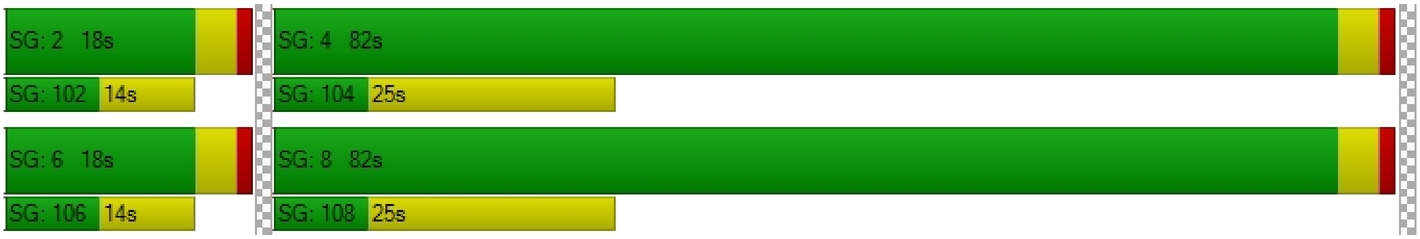
d_M, Delay for Movement [s/veh]	3.40	1.95	1.95	2.66	2.33	2.33	47.99	47.99	47.99	44.45	44.45	44.45
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.99			2.33			47.99			44.45		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.59											
Intersection LOS	A											
Intersection V/C	0.375											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.693	2.735	1.816	1.768
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.211	2.439	1.733	1.639
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	40	437	98	152	710	72	73	215	59	191	323	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	437	98	152	710	72	73	215	59	191	323	196
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	117	26	47	219	22	20	59	16	57	96	58
Total Analysis Volume [veh/h]	43	469	105	188	878	89	80	236	65	228	385	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	10	39	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	49	49	59	59	59	33	33	33	33	33	33
g / C, Green / Cycle	0.49	0.49	0.49	0.59	0.59	0.59	0.33	0.33	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.07	0.16	0.16	0.19	0.25	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	632	1870	1754	966	3560	1589	804	1870	1735	1078	1870	1636
c, Capacity [veh/h]	285	924	866	598	2115	944	204	609	565	337	609	533
d1, Uniform Delay [s]	23.57	15.19	15.22	9.84	10.93	8.72	38.77	24.77	24.83	36.04	27.59	27.60
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.12	0.91	0.98	1.37	0.60	0.20	1.22	0.22	0.24	2.37	0.75	0.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.32	0.32	0.31	0.42	0.09	0.39	0.25	0.26	0.68	0.54	0.54
d, Delay for Lane Group [s/veh]	24.69	16.10	16.20	11.22	11.53	8.92	40.00	24.98	25.07	38.41	28.34	28.46
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.81	4.15	3.94	1.99	5.07	0.84	1.87	2.70	2.58	5.44	6.47	5.69
50th-Percentile Queue Length [ft/ln]	20.13	103.70	98.60	49.82	126.73	21.09	46.87	67.41	64.48	136.03	161.70	142.26
95th-Percentile Queue Length [veh/ln]	1.45	7.47	7.10	3.59	8.76	1.52	3.37	4.85	4.64	9.27	10.64	9.60
95th-Percentile Queue Length [ft/ln]	36.23	186.66	177.47	89.68	219.04	37.96	84.36	121.33	116.07	231.67	265.98	240.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.69	16.14	16.20	11.22	11.53	8.92	40.00	25.01	25.07	38.41	28.36	28.46
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	16.75			11.28			28.17			31.09		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.14											
Intersection LOS	C											
Intersection V/C	0.521											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.978	2.886	2.541	2.710
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	700	1140	1140
d_b, Bicycle Delay [s]	28.13	21.13	9.25	9.25
I_b,int, Bicycle LOS Score for Intersection	2.069	2.512	1.874	2.258
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	22	49	42	22	33	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	49	42	22	33	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	22	14	8	11	5
Total Analysis Volume [veh/h]	40	88	57	30	46	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	956	831	832
Degree of Utilization, x	0.13	0.10	0.08

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	0.35	0.26
95th-Percentile Queue Length [ft]	11.54	8.74	6.55
Approach Delay [s/veh]	7.35	7.84	7.70
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.58		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	10	39	38	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	39	38	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	18	13	6	12	2
Total Analysis Volume [veh/h]	18	70	52	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.74	8.90
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft/ln]	0.90	0.90	0.00	0.00	5.20	5.20
d_A, Approach Delay [s/veh]	1.51		0.00		9.63	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.01					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	3	19	38	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	19	38	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	6	13	5	7	3
Total Analysis Volume [veh/h]	4	25	53	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	0.00	9.17	8.77
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft/ln]	0.20	0.20	0.00	0.00	3.39	3.39
d_A, Approach Delay [s/veh]	1.02		0.00		9.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.78					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.118

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	34	0	318	10	0	272	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	34	0	318	10	0	272	17
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	20	0	0	15	0	88	3	0	79	5
Total Analysis Volume [veh/h]	0	0	81	0	0	61	0	351	11	0	317	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.93	0.00	0.00	10.51	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.40	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	9.96	0.00	0.00	6.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.93			10.51			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.82											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	5.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.381

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	32	980	27	39	875	45	22	1	49	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	980	27	39	875	45	22	1	49	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	266	7	10	229	12	7	0	17	6	1	9
Total Analysis Volume [veh/h]	35	1064	29	41	917	47	30	1	66	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.29	0.08	0.26	0.26	0.06	0.04
s, saturation flow rate [veh/h]	583	1870	1853	516	1870	1838	1718	1667
c, Capacity [veh/h]	520	1587	1572	463	1587	1560	170	168
d1, Uniform Delay [s]	2.85	1.62	1.62	3.16	1.55	1.55	45.59	44.67
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	0.60	0.60	0.38	0.50	0.51	2.99	1.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.35	0.35	0.09	0.31	0.31	0.57	0.36
d, Delay for Lane Group [s/veh]	3.10	2.22	2.23	3.54	2.05	2.06	48.58	45.94
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.17	1.28	1.27	0.22	1.08	1.06	2.51	1.50
50th-Percentile Queue Length [ft/ln]	4.19	32.01	31.78	5.45	26.99	26.62	62.86	37.49
95th-Percentile Queue Length [veh/ln]	0.30	2.30	2.29	0.39	1.94	1.92	4.53	2.70
95th-Percentile Queue Length [ft/ln]	7.53	57.61	57.21	9.81	48.58	47.92	113.15	67.47

Movement, Approach, & Intersection Results

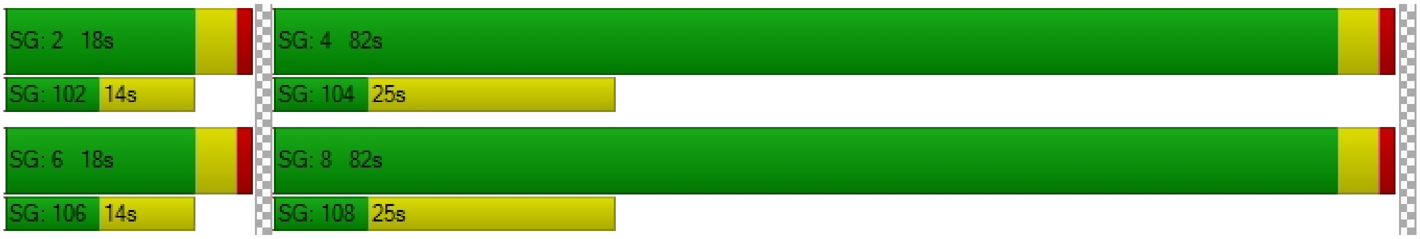
d_M, Delay for Movement [s/veh]	3.10	2.23	2.23	3.54	2.05	2.06	48.58	48.58	48.58	45.94	45.94	45.94
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.25			2.12			48.58			45.94		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.30											
Intersection LOS	A											
Intersection V/C	0.381											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.752	2.763	1.843	1.831
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.490	2.389	1.720	1.659
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	22.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	91	773	160	274	593	74	78	357	44	163	267	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	773	160	274	593	74	78	357	44	163	267	159
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	218	45	73	158	20	20	92	11	44	73	43
Total Analysis Volume [veh/h]	103	872	181	292	633	79	81	370	46	178	291	173
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	42	0	17	59	0	0	41	0	0	41	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	46	46	60	60	60	32	32	32	32	32	32
g / C, Green / Cycle	0.46	0.46	0.46	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.13	0.29	0.29	0.37	0.18	0.05	0.09	0.11	0.11	0.18	0.13	0.13
s, saturation flow rate [veh/h]	794	1870	1760	785	3560	1589	928	1870	1799	970	1870	1641
c, Capacity [veh/h]	353	865	814	462	2147	959	252	593	570	276	593	520
d1, Uniform Delay [s]	23.94	20.35	20.37	14.88	9.58	8.29	35.63	26.30	26.33	38.16	26.86	26.91
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.08	3.43	3.65	6.46	0.35	0.17	0.73	0.36	0.38	2.51	0.46	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.63	0.63	0.63	0.29	0.08	0.32	0.36	0.36	0.64	0.41	0.42
d, Delay for Lane Group [s/veh]	26.02	23.77	24.02	21.34	9.93	8.46	36.36	26.66	26.71	40.67	27.32	27.46
Lane Group LOS	C	C	C	C	A	A	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.98	10.00	9.49	3.67	3.23	0.72	1.78	3.89	3.79	4.35	4.63	4.14
50th-Percentile Queue Length [ft/ln]	49.56	249.96	237.18	91.65	80.80	18.01	44.62	97.31	94.64	108.69	115.70	103.46
95th-Percentile Queue Length [veh/ln]	3.57	15.18	14.54	6.60	5.82	1.30	3.21	7.01	6.81	7.77	8.16	7.45
95th-Percentile Queue Length [ft/ln]	89.21	379.60	363.47	164.97	145.43	32.41	80.31	175.16	170.35	194.18	203.91	186.22

Movement, Approach, & Intersection Results

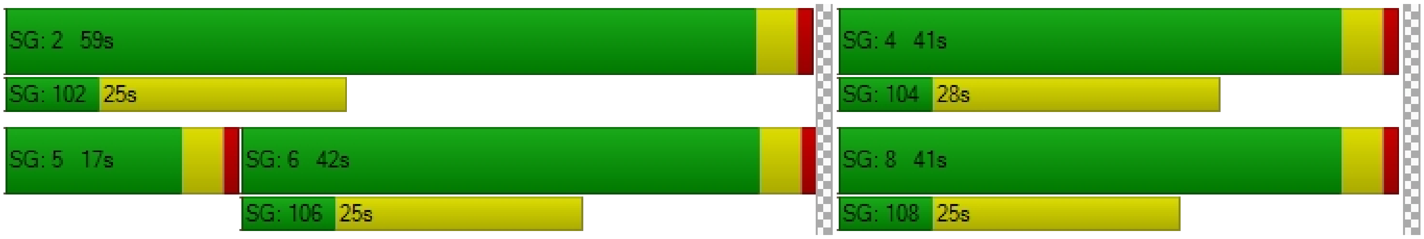
d_M, Delay for Movement [s/veh]	26.02	23.87	24.02	21.34	9.93	8.46	36.36	26.68	26.71	40.67	27.34	27.46
Movement LOS	C	C	C	C	A	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	24.08			13.13			28.26			31.07		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.74											
Intersection LOS	C											
Intersection V/C	0.635											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.950	2.919	2.640	2.795
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	760	1100	740	740
d_b, Bicycle Delay [s]	19.22	10.13	19.85	19.85
I_b,int, Bicycle LOS Score for Intersection	2.513	2.388	1.970	2.089
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.152

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	34	32	20	27	58	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	32	20	27	58	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	10	6	8	20	13
Total Analysis Volume [veh/h]	44	42	23	31	81	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	902	819	874
Degree of Utilization, x	0.10	0.07	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	0.21	0.54
95th-Percentile Queue Length [ft]	7.88	5.28	13.39
Approach Delay [s/veh]	7.41	7.71	7.86
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.69		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	9	47	47	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	47	47	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	15	14	11	9	0
Total Analysis Volume [veh/h]	12	61	54	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	0.00	9.57	8.85
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.61	0.61	0.00	0.00	3.33	3.33
d_A, Approach Delay [s/veh]	1.22		0.00		9.57	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		↔	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	4	45	27	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	45	27	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	12	4	6	1
Total Analysis Volume [veh/h]	6	64	49	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.35	0.00	0.00	0.00	9.34	8.71
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.58	2.58
d_A, Approach Delay [s/veh]	0.63		0.00		9.28	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.093

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	20	0	346	5	0	349	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	20	0	346	5	0	349	46
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	104	2	0	93	12
Total Analysis Volume [veh/h]	0	0	59	0	0	25	0	415	6	0	372	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.09	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.25	0.00	0.00	10.73	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.31	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	7.65	0.00	0.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.25			10.73			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.01											
Intersection LOS	B											

APPENDIX C-IV

EXISTING PLUS PROJECT WITH "COMPLETE STREETS" IMPROVEMENTS TRAFFIC CONDITION

Intersection Level Of Service Report
Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.560

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	21	534	7	12	707	19	37	0	56	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	534	7	12	707	19	37	0	56	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	152	2	3	206	6	10	0	16	3	1	8
Total Analysis Volume [veh/h]	24	606	8	14	824	22	42	0	63	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	89	89	89	89	8	8
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.02	0.45	0.06	0.03
s, saturation flow rate [veh/h]	651	1866	808	1861	1668	1715
c, Capacity [veh/h]	518	1578	670	1574	179	178
d1, Uniform Delay [s]	5.22	1.87	3.50	2.29	47.39	45.89
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.73	0.06	1.32	3.06	0.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.39	0.02	0.54	0.59	0.27
d, Delay for Lane Group [s/veh]	5.39	2.59	3.55	3.62	50.45	46.70
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.18	1.79	0.08	3.07	2.86	1.24
50th-Percentile Queue Length [ft/ln]	4.42	44.68	1.89	76.69	71.46	30.93
95th-Percentile Queue Length [veh/ln]	0.32	3.22	0.14	5.52	5.14	2.23
95th-Percentile Queue Length [ft/ln]	7.96	80.43	3.41	138.05	128.62	55.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.39	2.59	2.59	3.55	3.62	3.62	50.45	50.45	50.45	46.70	46.70	46.70
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.70			3.61			50.45			46.70		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.49											
Intersection LOS	A											
Intersection V/C	0.560											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.532	2.573	1.819	1.770
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	2.612	2.979	1.733	1.639
Bicycle LOS	B	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	40	350	98	152	568	72	73	215	59	191	323	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	350	98	152	568	72	73	215	59	191	323	196
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	94	26	47	176	22	20	59	16	57	96	58
Total Analysis Volume [veh/h]	43	376	105	188	702	89	80	236	65	228	385	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	41	0	21	62	0	0	43	0	0	43	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	52	52	52	63	63	63	34	34	34	34	34	34
g / C, Green / Cycle	0.50	0.50	0.50	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.06	0.20	0.07	0.17	0.38	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	745	1870	1589	1119	1870	1589	804	1870	1735	1078	1870	1636
c, Capacity [veh/h]	244	929	790	648	1129	959	195	599	555	327	599	524
d1, Uniform Delay [s]	32.50	16.64	14.23	10.30	13.21	8.74	41.42	26.44	26.50	38.48	29.45	29.47
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.14	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.31	0.35	1.13	2.58	0.19	1.38	0.22	0.25	3.47	0.79	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.40	0.13	0.29	0.62	0.09	0.41	0.26	0.26	0.70	0.55	0.55
d, Delay for Lane Group [s/veh]	34.06	17.95	14.58	11.44	15.79	8.93	42.80	26.66	26.75	41.95	30.25	30.38
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.99	5.88	1.40	2.02	10.54	0.87	2.00	2.89	2.76	5.90	6.92	6.09
50th-Percentile Queue Length [ft/ln]	24.75	146.91	34.99	50.60	263.59	21.69	50.11	72.15	69.01	147.46	173.08	152.26
95th-Percentile Queue Length [veh/ln]	1.78	9.85	2.52	3.64	15.87	1.56	3.61	5.19	4.97	9.88	11.24	10.14
95th-Percentile Queue Length [ft/ln]	44.55	246.30	62.98	91.08	396.73	39.04	90.19	129.87	124.22	247.03	280.96	253.44

Movement, Approach, & Intersection Results

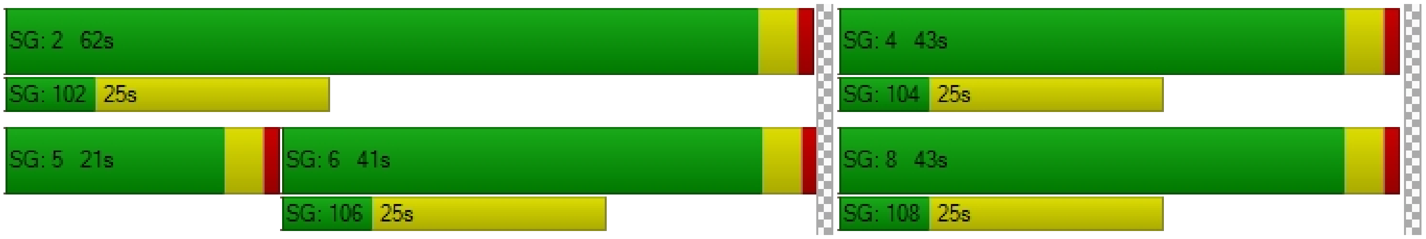
d_M, Delay for Movement [s/veh]	34.06	17.95	14.58	11.44	15.79	8.93	42.80	26.69	26.75	41.95	30.26	30.38
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	18.59			14.33			30.09			33.44		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	23.28											
Intersection LOS	C											
Intersection V/C	0.663											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.928	2.746	2.543	2.714
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	705	1105	743	743
d_b, Bicycle Delay [s]	22.02	10.52	20.74	20.74
I_b,int, Bicycle LOS Score for Intersection	2.424	3.175	1.874	2.258
Bicycle LOS	B	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	22	49	42	22	33	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	49	42	22	33	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	22	14	8	11	5
Total Analysis Volume [veh/h]	40	88	57	30	46	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	956	831	832
Degree of Utilization, x	0.13	0.10	0.08

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	0.35	0.26
95th-Percentile Queue Length [ft]	11.54	8.74	6.55
Approach Delay [s/veh]	7.35	7.84	7.70
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.58		
Intersection LOS	A		

Intersection Level Of Service Report

Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰↑		↑↱		↰↱	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	10	39	38	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	39	38	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	18	13	6	12	2
Total Analysis Volume [veh/h]	18	70	52	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.74	8.90
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft/ln]	0.90	0.90	0.00	0.00	5.20	5.20
d_A, Approach Delay [s/veh]	1.51		0.00		9.63	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.01					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	3	19	38	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	19	38	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	6	13	5	7	3
Total Analysis Volume [veh/h]	4	25	53	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	0.00	9.17	8.77
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft/ln]	0.20	0.20	0.00	0.00	3.39	3.39
d_A, Approach Delay [s/veh]	1.02		0.00		9.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.78					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.118

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	34	0	318	10	0	272	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	34	0	318	10	0	272	17
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	20	0	0	15	0	88	3	0	79	5
Total Analysis Volume [veh/h]	0	0	81	0	0	61	0	351	11	0	317	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.93	0.00	0.00	10.51	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.40	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	9.96	0.00	0.00	6.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.93			10.51			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.82											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.574

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			↰↑↱			↰↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	32	784	27	39	700	45	22	1	49	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	784	27	39	700	45	22	1	49	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	213	7	10	183	12	7	0	17	6	1	9
Total Analysis Volume [veh/h]	35	851	29	41	734	47	30	1	66	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	90	90	90	90	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.05	0.47	0.07	0.42	0.06	0.04
s, saturation flow rate [veh/h]	692	1859	631	1850	1709	1650
c, Capacity [veh/h]	565	1585	506	1578	167	164
d1, Uniform Delay [s]	4.39	2.17	5.29	1.97	47.90	46.93
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	1.41	0.31	1.11	3.20	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.56	0.08	0.50	0.58	0.37
d, Delay for Lane Group [s/veh]	4.60	3.57	5.60	3.09	51.10	48.29
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.23	2.97	0.31	2.39	2.65	1.58
50th-Percentile Queue Length [ft/ln]	5.73	74.16	7.74	59.65	66.36	39.56
95th-Percentile Queue Length [veh/ln]	0.41	5.34	0.56	4.29	4.78	2.85
95th-Percentile Queue Length [ft/ln]	10.31	133.50	13.94	107.37	119.45	71.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.60	3.57	3.57	5.60	3.09	3.09	51.10	51.10	51.10	48.29	48.29	48.29
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.61			3.21			51.10			48.29		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.29											
Intersection LOS	A											
Intersection V/C	0.574											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.593	2.605	1.846	1.834
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	3.069	2.916	1.720	1.659
Bicycle LOS	C	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	91	618	160	274	474	74	78	357	44	163	267	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	618	160	274	474	74	78	357	44	163	267	159
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	174	45	73	126	20	20	92	11	44	73	43
Total Analysis Volume [veh/h]	103	698	181	292	506	79	81	370	46	178	291	173
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	61	0	10	71	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	57	57	67	67	67	30	30	30	30	30	30
g / C, Green / Cycle	0.54	0.54	0.54	0.64	0.64	0.64	0.29	0.29	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.12	0.37	0.11	0.33	0.27	0.05	0.09	0.11	0.11	0.18	0.13	0.13
s, saturation flow rate [veh/h]	893	1870	1589	872	1870	1589	928	1870	1799	970	1870	1641
c, Capacity [veh/h]	413	1013	861	451	1193	1014	214	534	514	238	534	469
d1, Uniform Delay [s]	22.40	17.58	12.43	14.93	9.43	7.24	40.86	30.19	30.22	43.73	30.83	30.89
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.19	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.44	3.83	0.56	7.05	1.11	0.15	1.10	0.47	0.50	7.84	0.62	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.25	0.69	0.21	0.65	0.42	0.08	0.38	0.40	0.40	0.75	0.46	0.47
d, Delay for Lane Group [s/veh]	23.84	21.40	12.99	21.98	10.53	7.39	41.96	30.66	30.72	51.57	31.44	31.62
Lane Group LOS	C	C	B	C	B	A	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.91	12.73	2.27	3.56	5.69	0.68	1.99	4.34	4.22	5.14	5.16	4.62
50th-Percentile Queue Length [ft/ln]	47.86	318.23	56.75	89.03	142.21	17.00	49.77	108.52	105.55	128.39	129.09	115.45
95th-Percentile Queue Length [veh/ln]	3.45	18.58	4.09	6.41	9.60	1.22	3.58	7.76	7.59	8.85	8.89	8.14
95th-Percentile Queue Length [ft/ln]	86.15	464.50	102.14	160.25	239.99	30.60	89.59	193.95	189.79	221.30	222.25	203.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.84	21.40	12.99	21.98	10.53	7.39	41.96	30.69	30.72	51.57	31.47	31.62
Movement LOS	C	C	B	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	20.11			14.06			32.53			37.08		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	24.03											
Intersection LOS	C											
Intersection V/C	0.710											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.894	2.779	2.643	2.830
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1086	1276	571	571
d_b, Bicycle Delay [s]	10.97	6.88	26.79	26.79
I_b,int, Bicycle LOS Score for Intersection	3.180	3.007	1.970	2.089
Bicycle LOS	C	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.152

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↑↱		↰↑		↰↱	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	34	32	20	27	58	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	32	20	27	58	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	10	6	8	20	13
Total Analysis Volume [veh/h]	44	42	23	31	81	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	902	819	874
Degree of Utilization, x	0.10	0.07	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	0.21	0.54
95th-Percentile Queue Length [ft]	7.88	5.28	13.39
Approach Delay [s/veh]	7.41	7.71	7.86
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.69		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	9	47	47	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	47	47	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	15	14	11	9	0
Total Analysis Volume [veh/h]	12	61	54	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	0.00	9.57	8.85
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.61	0.61	0.00	0.00	3.33	3.33
d_A, Approach Delay [s/veh]	1.22		0.00		9.57	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰↑		↑↱		↰↱	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	4	45	27	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	45	27	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	12	4	6	1
Total Analysis Volume [veh/h]	6	64	49	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.35	0.00	0.00	0.00	9.34	8.71
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.58	2.58
d_A, Approach Delay [s/veh]	0.63		0.00		9.28	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.093

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	47	0	0	20	0	346	5	0	349	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	47	0	0	20	0	346	5	0	349	46
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	104	2	0	93	12
Total Analysis Volume [veh/h]	0	0	59	0	0	25	0	415	6	0	372	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.09	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.25	0.00	0.00	10.73	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.31	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	7.65	0.00	0.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.25			10.73			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.01											
Intersection LOS	B											

APPENDIX C-V

YEAR 2024 CUMULATIVE TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	21	707	7	12	916	10	22	0	57	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	707	7	12	916	10	22	0	57	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	201	2	3	267	3	6	0	16	3	1	8
Total Analysis Volume [veh/h]	24	802	8	14	1068	12	25	0	64	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.05	0.22	0.22	0.02	0.29	0.29	0.05	0.03
s, saturation flow rate [veh/h]	522	1870	1863	673	1870	1863	1702	1747
c, Capacity [veh/h]	472	1596	1590	601	1596	1589	160	162
d1, Uniform Delay [s]	2.85	1.37	1.37	2.33	1.51	1.51	45.86	44.81
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.38	0.39	0.07	0.58	0.58	3.03	1.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.25	0.25	0.02	0.34	0.34	0.56	0.30
d, Delay for Lane Group [s/veh]	3.05	1.76	1.76	2.41	2.09	2.09	48.88	45.82
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.78	0.78	0.06	1.15	1.15	2.31	1.20
50th-Percentile Queue Length [ft/ln]	2.92	19.46	19.41	1.38	28.75	28.66	57.86	29.88
95th-Percentile Queue Length [veh/ln]	0.21	1.40	1.40	0.10	2.07	2.06	4.17	2.15
95th-Percentile Queue Length [ft/ln]	5.25	35.03	34.94	2.49	51.74	51.59	104.14	53.79

Movement, Approach, & Intersection Results

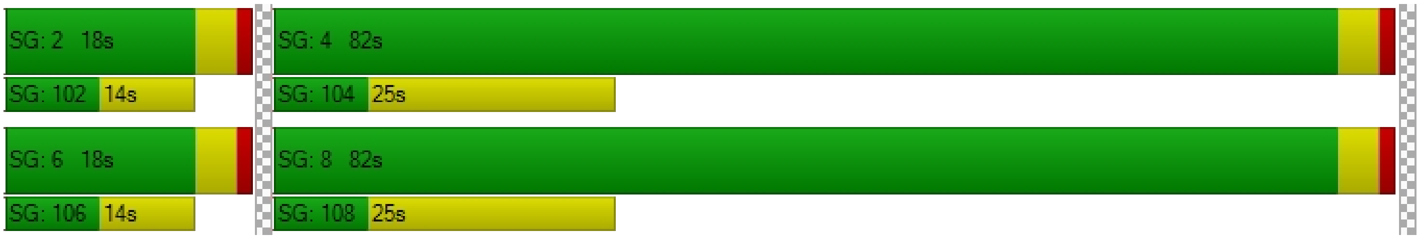
d_M, Delay for Movement [s/veh]	3.05	1.76	1.76	2.41	2.09	2.09	48.88	48.88	48.88	45.82	45.82	45.82
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.80			2.10			48.88			45.82		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.01											
Intersection LOS	A											
Intersection V/C	0.371											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.709	2.721	1.806	1.768
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.248	2.462	1.706	1.639
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.530

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	35	462	99	163	731	73	74	218	52	193	327	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	462	99	163	731	73	74	218	52	193	327	209
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	124	27	50	226	23	20	60	14	58	97	62
Total Analysis Volume [veh/h]	38	496	106	201	904	90	81	239	57	230	390	249
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	10	55	0	0	45	0	0	45	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	50	50	60	60	60	32	32	32	32	32	32
g / C, Green / Cycle	0.50	0.50	0.50	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.06	0.17	0.17	0.21	0.25	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	616	1870	1758	946	3560	1589	790	1870	1749	1083	1870	1630
c, Capacity [veh/h]	279	928	872	588	2124	948	194	605	566	336	605	527
d1, Uniform Delay [s]	23.47	15.20	15.22	9.88	10.92	8.63	39.84	24.89	24.94	36.27	27.98	27.99
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	0.97	1.04	1.58	0.63	0.20	1.43	0.21	0.24	2.46	0.83	0.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.33	0.34	0.34	0.43	0.09	0.42	0.25	0.26	0.68	0.56	0.56
d, Delay for Lane Group [s/veh]	24.48	16.16	16.26	11.47	11.54	8.83	41.27	25.10	25.18	38.72	28.81	28.95
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.71	4.36	4.15	2.15	5.23	0.85	1.94	2.65	2.55	5.52	6.78	5.93
50th-Percentile Queue Length [ft/ln]	17.71	109.10	103.81	53.63	130.74	21.17	48.42	66.28	63.73	137.95	169.43	148.36
95th-Percentile Queue Length [veh/ln]	1.27	7.79	7.47	3.86	8.98	1.52	3.49	4.77	4.59	9.37	11.05	9.93
95th-Percentile Queue Length [ft/ln]	31.87	194.75	186.86	96.53	224.50	38.11	87.16	119.30	114.71	234.26	276.17	248.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.48	16.20	16.26	11.47	11.54	8.83	41.27	25.13	25.18	38.72	28.83	28.95
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	16.70			11.33			28.61			31.48		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.24											
Intersection LOS	C											
Intersection V/C	0.530											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.989	2.901	2.533	2.728
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	820	1020	820	820
d_b, Bicycle Delay [s]	17.41	12.01	17.41	17.41
I_b,int, Bicycle LOS Score for Intersection	2.088	2.545	1.871	2.277
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	22	34	43	22	24	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	34	43	22	24	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	15	15	8	8	5
Total Analysis Volume [veh/h]	40	61	59	30	33	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	952	842	853
Degree of Utilization, x	0.11	0.11	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.35	0.35	0.20
95th-Percentile Queue Length [ft]	8.87	8.84	5.06
Approach Delay [s/veh]	7.23	7.78	7.50
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.49		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	10	24	29	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	24	29	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	11	10	6	12	2
Total Analysis Volume [veh/h]	18	43	40	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	0.00	9.49	8.81
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.20	0.20
95th-Percentile Queue Length [ft/ln]	0.89	0.89	0.00	0.00	4.95	4.95
d_A, Approach Delay [s/veh]	2.17		0.00		9.40	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.60					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┫		┣		┳	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	3	12	25	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	12	25	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	9	5	7	3
Total Analysis Volume [veh/h]	4	16	35	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	0.00	9.02	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.19	0.19	0.00	0.00	3.27	3.27
d_A, Approach Delay [s/veh]	1.47		0.00		8.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.39					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.121

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	34	0	328	10	0	280	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	34	0	328	10	0	280	10
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	21	0	0	15	0	91	3	0	81	3
Total Analysis Volume [veh/h]	0	0	82	0	0	61	0	362	11	0	326	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.04	0.00	0.00	10.55	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.41	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	10.26	0.00	0.00	7.03	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.04			10.55			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.81											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	4.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.383

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	32	1015	27	39	909	28	12	1	50	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	1015	27	39	909	28	12	1	50	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	276	7	10	238	7	4	0	17	6	1	9
Total Analysis Volume [veh/h]	35	1102	29	41	953	29	16	1	68	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	6	6
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.30	0.08	0.26	0.26	0.05	0.04
s, saturation flow rate [veh/h]	573	1870	1853	498	1870	1851	1737	1683
c, Capacity [veh/h]	518	1602	1587	454	1602	1585	153	156
d1, Uniform Delay [s]	2.61	1.48	1.48	2.95	1.40	1.40	46.11	45.45
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	0.62	0.62	0.39	0.50	0.50	3.14	1.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.35	0.35	0.09	0.31	0.31	0.56	0.38
d, Delay for Lane Group [s/veh]	2.86	2.09	2.10	3.35	1.90	1.90	49.25	47.00
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.16	1.16	1.15	0.21	0.95	0.94	2.22	1.52
50th-Percentile Queue Length [ft/ln]	3.94	29.04	28.85	5.23	23.80	23.61	55.49	38.01
95th-Percentile Queue Length [veh/ln]	0.28	2.09	2.08	0.38	1.71	1.70	4.00	2.74
95th-Percentile Queue Length [ft/ln]	7.09	52.27	51.94	9.42	42.83	42.49	99.88	68.42

Movement, Approach, & Intersection Results

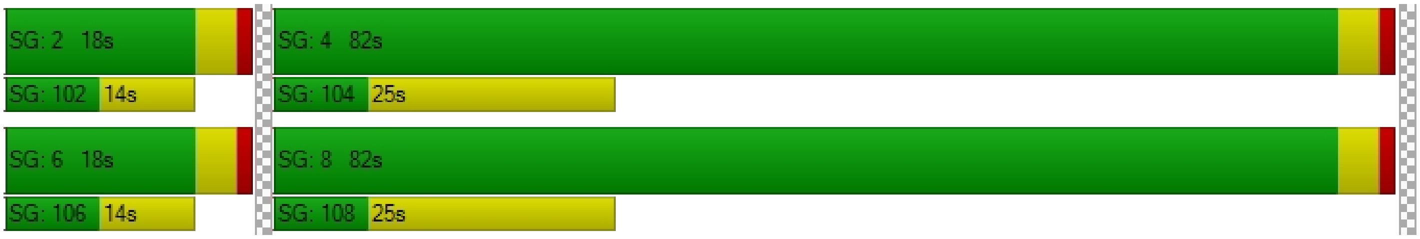
d_M, Delay for Movement [s/veh]	2.86	2.09	2.10	3.35	1.90	1.90	49.25	49.25	49.25	47.00	47.00	47.00
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.12			1.96			49.25			47.00		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.92											
Intersection LOS	A											
Intersection V/C	0.383											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.767	2.752	1.831	1.831
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.522	2.404	1.700	1.659
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	83	797	162	285	615	75	79	362	39	165	268	169
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	797	162	285	615	75	79	362	39	165	268	169
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	225	46	76	164	20	20	94	10	45	73	46
Total Analysis Volume [veh/h]	94	900	183	304	656	80	82	375	40	180	292	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	39	0	24	63	0	0	37	0	0	37	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	46	46	61	61	61	31	31	31	31	31	31
g / C, Green / Cycle	0.46	0.46	0.46	0.61	0.61	0.61	0.31	0.31	0.31	0.31	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.12	0.30	0.30	0.39	0.18	0.05	0.09	0.11	0.11	0.19	0.14	0.14
s, saturation flow rate [veh/h]	777	1870	1762	785	3560	1589	918	1870	1808	971	1870	1633
c, Capacity [veh/h]	342	857	808	461	2156	962	243	588	569	273	588	514
d1, Uniform Delay [s]	24.18	20.88	20.90	15.67	9.54	8.20	36.37	26.46	26.49	38.58	27.16	27.22
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.13	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.98	3.80	4.06	7.19	0.36	0.17	0.81	0.37	0.38	3.27	0.50	0.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.65	0.65	0.66	0.30	0.08	0.34	0.36	0.36	0.66	0.43	0.44
d, Delay for Lane Group [s/veh]	26.16	24.68	24.96	22.87	9.91	8.37	37.19	26.83	26.88	41.85	27.65	27.80
Lane Group LOS	C	C	C	C	A	A	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.81	10.53	10.01	3.88	3.35	0.72	1.83	3.89	3.80	4.48	4.80	4.27
50th-Percentile Queue Length [ft/ln]	45.35	263.24	250.27	96.91	83.75	18.11	45.82	97.24	94.91	112.03	120.06	106.76
95th-Percentile Queue Length [veh/ln]	3.26	15.85	15.20	6.98	6.03	1.30	3.30	7.00	6.83	7.95	8.40	7.66
95th-Percentile Queue Length [ft/ln]	81.62	396.28	379.99	174.44	150.74	32.59	82.47	175.04	170.84	198.82	209.91	191.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.16	24.79	24.96	22.87	9.91	8.37	37.19	26.85	26.88	41.85	27.67	27.80
Movement LOS	C	C	C	C	A	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	24.92			13.58			28.56			31.60		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	23.26											
Intersection LOS	C											
Intersection V/C	0.651											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.961	2.933	2.626	2.808
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	1180	660	660
d_b, Bicycle Delay [s]	21.13	8.41	22.45	22.45
I_b,int, Bicycle LOS Score for Intersection	2.531	2.418	1.970	2.101
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 3: Linden Avenue at 59th Street (North)

Control Type: All-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 7.5
Level Of Service: A
Volume to Capacity (v/c): 0.122

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	34	22	20	27	41	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	22	20	27	41	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	7	6	8	14	13
Total Analysis Volume [veh/h]	44	29	23	31	57	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	903	832	894
Degree of Utilization, x	0.08	0.06	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.21	0.41
95th-Percentile Queue Length [ft]	6.58	5.19	10.36
Approach Delay [s/veh]	7.34	7.63	7.58
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.52		
Intersection LOS	A		

Intersection Level Of Service Report

Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	9	37	30	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	37	30	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	12	9	11	9	0
Total Analysis Volume [veh/h]	12	48	35	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.38	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.60	0.60	0.00	0.00	3.19	3.19
d_A, Approach Delay [s/veh]	1.48		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	4	31	19	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	31	19	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	11	9	4	6	1
Total Analysis Volume [veh/h]	6	44	35	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.32	0.00	0.00	0.00	9.15	8.63
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.47	2.47
d_A, Approach Delay [s/veh]	0.88		0.00		9.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.37					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.097

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	20	0	355	5	0	356	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	20	0	355	5	0	356	32
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	107	2	0	95	9
Total Analysis Volume [veh/h]	0	0	61	0	0	25	0	426	6	0	380	34
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.37	0.00	0.00	10.74	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.32	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	8.06	0.00	0.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.37			10.74			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.03											
Intersection LOS	B											

APPENDIX C-VI

YEAR 2024 CUMULATIVE WITH "COMPLETE STREETS" IMPROVEMENTS TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	21	565	7	12	732	10	22	0	57	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	565	7	12	732	10	22	0	57	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	160	2	3	213	3	6	0	16	3	1	8
Total Analysis Volume [veh/h]	24	641	8	14	853	12	25	0	64	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	90	90	90	90	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.04	0.35	0.02	0.46	0.05	0.03
s, saturation flow rate [veh/h]	639	1866	782	1865	1699	1735
c, Capacity [veh/h]	521	1600	659	1599	157	159
d1, Uniform Delay [s]	4.68	1.64	3.21	1.99	48.17	47.07
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.77	0.06	1.32	3.20	1.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.41	0.02	0.54	0.57	0.30
d, Delay for Lane Group [s/veh]	4.85	2.40	3.27	3.31	51.37	48.12
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.16	1.60	0.07	2.62	2.44	1.26
50th-Percentile Queue Length [ft/ln]	4.12	39.91	1.78	65.52	61.03	31.52
95th-Percentile Queue Length [veh/ln]	0.30	2.87	0.13	4.72	4.39	2.27
95th-Percentile Queue Length [ft/ln]	7.42	71.83	3.21	117.94	109.85	56.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.85	2.40	2.40	3.27	3.31	3.31	51.37	51.37	51.37	48.12	48.12	48.12
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.49			3.31			51.37			48.12		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.79											
Intersection LOS	A											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.548	2.558	1.808	1.770
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	2.670	3.010	1.706	1.639
Bicycle LOS	B	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	35	370	99	163	585	73	74	218	52	193	327	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	370	99	163	585	73	74	218	52	193	327	209
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	99	27	50	181	23	20	60	14	58	97	62
Total Analysis Volume [veh/h]	38	397	106	201	723	90	81	239	57	230	390	249
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	41	0	21	62	0	0	43	0	0	43	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	52	52	52	63	63	63	34	34	34	34	34	34
g / C, Green / Cycle	0.49	0.49	0.49	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.05	0.21	0.07	0.18	0.39	0.06	0.10	0.08	0.08	0.21	0.18	0.18
s, saturation flow rate [veh/h]	730	1870	1589	1108	1870	1589	790	1870	1749	1083	1870	1630
c, Capacity [veh/h]	230	922	784	634	1129	960	188	599	560	330	599	522
d1, Uniform Delay [s]	33.60	17.12	14.45	10.57	13.44	8.74	42.19	26.41	26.46	38.40	29.69	29.70
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.14	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.54	1.47	0.36	1.31	2.79	0.19	1.57	0.22	0.24	3.50	0.86	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.43	0.14	0.32	0.64	0.09	0.43	0.25	0.26	0.70	0.57	0.57
d, Delay for Lane Group [s/veh]	35.15	18.59	14.81	11.88	16.23	8.93	43.76	26.63	26.71	41.90	30.55	30.69
Lane Group LOS	D	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.89	6.36	1.43	2.19	11.08	0.88	2.06	2.83	2.72	5.95	7.22	6.32
50th-Percentile Queue Length [ft/ln]	22.32	159.03	35.67	54.81	276.94	21.94	51.46	70.65	67.93	148.69	180.59	158.11
95th-Percentile Queue Length [veh/ln]	1.61	10.50	2.57	3.95	16.54	1.58	3.71	5.09	4.89	9.95	11.63	10.45
95th-Percentile Queue Length [ft/ln]	40.17	262.44	64.21	98.65	413.39	39.48	92.64	127.18	122.28	248.69	290.78	261.22

Movement, Approach, & Intersection Results

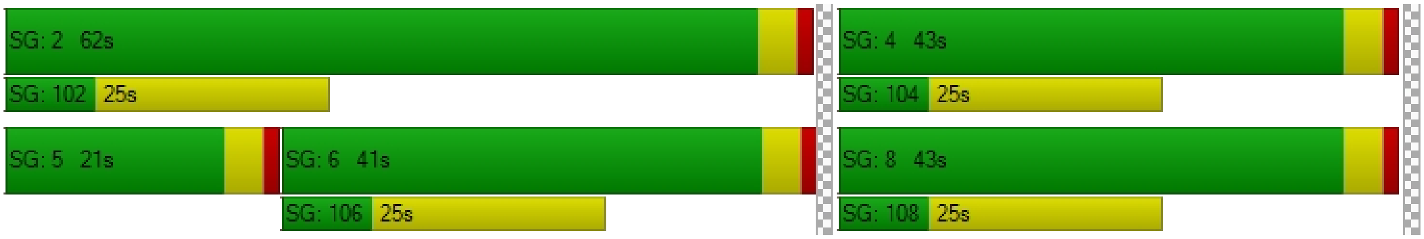
d_M, Delay for Movement [s/veh]	35.15	18.59	14.81	11.88	16.23	8.93	43.76	26.65	26.71	41.90	30.56	30.69
Movement LOS	D	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	19.01			14.72			30.34			33.60		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	23.51											
Intersection LOS	C											
Intersection V/C	0.676											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.937	2.762	2.536	2.730
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	705	1105	743	743
d_b, Bicycle Delay [s]	22.02	10.52	20.74	20.74
I_b,int, Bicycle LOS Score for Intersection	2.452	3.233	1.871	2.277
Bicycle LOS	B	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	22	34	43	22	24	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	34	43	22	24	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	15	15	8	8	5
Total Analysis Volume [veh/h]	40	61	59	30	33	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	952	842	853
Degree of Utilization, x	0.11	0.11	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.35	0.35	0.20
95th-Percentile Queue Length [ft]	8.87	8.84	5.06
Approach Delay [s/veh]	7.23	7.78	7.50
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.49		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰↑		↑↱		↰↱	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	10	24	29	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	24	29	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	11	10	6	12	2
Total Analysis Volume [veh/h]	18	43	40	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	0.00	9.49	8.81
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.20	0.20
95th-Percentile Queue Length [ft/ln]	0.89	0.89	0.00	0.00	4.95	4.95
d_A, Approach Delay [s/veh]	2.17		0.00		9.40	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.60					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	3	12	25	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	12	25	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	9	5	7	3
Total Analysis Volume [veh/h]	4	16	35	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	0.00	9.02	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.19	0.19	0.00	0.00	3.27	3.27
d_A, Approach Delay [s/veh]	1.47		0.00		8.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.39					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.121

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	34	0	328	10	0	280	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	34	0	328	10	0	280	10
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	21	0	0	15	0	91	3	0	81	3
Total Analysis Volume [veh/h]	0	0	82	0	0	61	0	362	11	0	326	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.04	0.00	0.00	10.55	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.41	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	10.26	0.00	0.00	7.03	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.04			10.55			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.81											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	32	811	27	39	726	28	12	1	50	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	811	27	39	726	28	12	1	50	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	220	7	10	190	7	4	0	17	6	1	9
Total Analysis Volume [veh/h]	35	881	29	41	761	29	16	1	68	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	71	0	0	71	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	90	90	90	90	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.05	0.49	0.07	0.43	0.05	0.04
s, saturation flow rate [veh/h]	686	1860	613	1858	1736	1665
c, Capacity [veh/h]	571	1601	498	1600	150	151
d1, Uniform Delay [s]	3.97	1.98	5.03	1.76	48.48	47.80
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	1.47	0.32	1.09	3.36	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.57	0.08	0.49	0.57	0.40
d, Delay for Lane Group [s/veh]	4.18	3.45	5.36	2.85	51.85	49.48
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.21	2.71	0.30	2.08	2.34	1.61
50th-Percentile Queue Length [ft/ln]	5.35	67.87	7.52	51.88	58.59	40.16
95th-Percentile Queue Length [veh/ln]	0.39	4.89	0.54	3.74	4.22	2.89
95th-Percentile Queue Length [ft/ln]	9.63	122.17	13.54	93.39	105.47	72.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.18	3.45	3.45	5.36	2.85	2.85	51.85	51.85	51.85	49.48	49.48	49.48
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.48			2.98			51.85			49.48		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.84											
Intersection LOS	A											
Intersection V/C	0.583											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.607	2.591	1.834	1.834
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1276	1276	571	571
d_b, Bicycle Delay [s]	6.88	6.88	26.79	26.79
I_b,int, Bicycle LOS Score for Intersection	3.119	2.931	1.700	1.659
Bicycle LOS	C	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	83	637	162	285	492	75	79	362	39	165	268	169
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	637	162	285	492	75	79	362	39	165	268	169
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	180	46	76	131	20	20	94	10	45	73	46
Total Analysis Volume [veh/h]	94	719	183	304	525	80	82	375	40	180	292	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	60	0	10	70	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	56	56	66	66	66	31	31	31	31	31	31
g / C, Green / Cycle	0.53	0.53	0.53	0.63	0.63	0.63	0.30	0.30	0.30	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.11	0.38	0.12	0.35	0.28	0.05	0.09	0.11	0.11	0.19	0.14	0.14
s, saturation flow rate [veh/h]	877	1870	1589	861	1870	1589	918	1870	1808	971	1870	1633
c, Capacity [veh/h]	389	996	846	425	1175	999	220	552	534	249	552	482
d1, Uniform Delay [s]	23.66	18.65	12.97	16.71	10.07	7.63	40.24	29.38	29.41	42.69	30.14	30.21
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.18	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.47	4.53	0.59	9.84	1.23	0.16	1.05	0.43	0.45	6.37	0.59	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.72	0.22	0.71	0.45	0.08	0.37	0.38	0.38	0.72	0.46	0.46
d, Delay for Lane Group [s/veh]	25.13	23.18	13.56	26.55	11.30	7.78	41.30	29.81	29.86	49.06	30.74	30.90
Lane Group LOS	C	C	B	C	B	A	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.80	13.80	2.36	4.08	6.20	0.71	2.00	4.25	4.15	5.05	5.25	4.67
50th-Percentile Queue Length [ft/ln]	45.03	344.98	58.97	101.91	155.09	17.83	49.97	106.27	103.72	126.22	131.23	116.71
95th-Percentile Queue Length [veh/ln]	3.24	19.89	4.25	7.34	10.29	1.28	3.60	7.63	7.47	8.73	9.01	8.21
95th-Percentile Queue Length [ft/ln]	81.06	497.29	106.14	183.44	257.21	32.09	89.94	190.80	186.69	218.34	225.17	205.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.13	23.18	13.56	26.55	11.30	7.78	41.30	29.83	29.86	49.06	30.76	30.90
Movement LOS	C	C	B	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	21.60			16.09			31.72			35.82		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	24.66											
Intersection LOS	C											
Intersection V/C	0.730											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.903	2.793	2.629	2.842
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1067	1257	590	590
d_b, Bicycle Delay [s]	11.43	7.24	26.08	26.08
I_b,int, Bicycle LOS Score for Intersection	3.203	3.059	1.970	2.101
Bicycle LOS	C	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.122

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	34	22	20	27	41	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	22	20	27	41	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	7	6	8	14	13
Total Analysis Volume [veh/h]	44	29	23	31	57	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	903	832	894
Degree of Utilization, x	0.08	0.06	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.21	0.41
95th-Percentile Queue Length [ft]	6.58	5.19	10.36
Approach Delay [s/veh]	7.34	7.63	7.58
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.52		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	9	37	30	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	37	30	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	12	9	11	9	0
Total Analysis Volume [veh/h]	12	48	35	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.38	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.60	0.60	0.00	0.00	3.19	3.19
d_A, Approach Delay [s/veh]	1.48		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	4	31	19	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	31	19	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	11	9	4	6	1
Total Analysis Volume [veh/h]	6	44	35	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.32	0.00	0.00	0.00	9.15	8.63
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.47	2.47
d_A, Approach Delay [s/veh]	0.88		0.00		9.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.37					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.097

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	20	0	355	5	0	356	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	20	0	355	5	0	356	32
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	107	2	0	95	9
Total Analysis Volume [veh/h]	0	0	61	0	0	25	0	426	6	0	380	34
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.37	0.00	0.00	10.74	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.32	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	8.06	0.00	0.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.37			10.74			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.03											
Intersection LOS	B											

APPENDIX C-VII

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	5.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.387

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	21	707	7	12	916	19	37	0	57	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	707	7	12	916	19	37	0	57	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	201	2	3	267	6	10	0	16	3	1	8
Total Analysis Volume [veh/h]	24	802	8	14	1068	22	42	0	64	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	8	8
g / C, Green / Cycle	0.84	0.84	0.84	0.84	0.84	0.84	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.05	0.22	0.22	0.02	0.29	0.29	0.06	0.03
s, saturation flow rate [veh/h]	517	1870	1863	673	1870	1857	1669	1723
c, Capacity [veh/h]	459	1572	1567	591	1572	1561	183	182
d1, Uniform Delay [s]	3.32	1.62	1.62	2.69	1.79	1.79	45.06	43.61
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	0.40	0.40	0.07	0.61	0.61	2.90	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.26	0.26	0.02	0.35	0.35	0.58	0.26
d, Delay for Lane Group [s/veh]	3.54	2.02	2.02	2.77	2.40	2.41	47.96	44.37
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.13	0.96	0.96	0.06	1.45	1.44	2.73	1.17
50th-Percentile Queue Length [ft/ln]	3.26	24.12	24.05	1.55	36.16	35.95	68.33	29.28
95th-Percentile Queue Length [veh/ln]	0.23	1.74	1.73	0.11	2.60	2.59	4.92	2.11
95th-Percentile Queue Length [ft/ln]	5.87	43.41	43.29	2.78	65.08	64.72	122.99	52.71

Movement, Approach, & Intersection Results

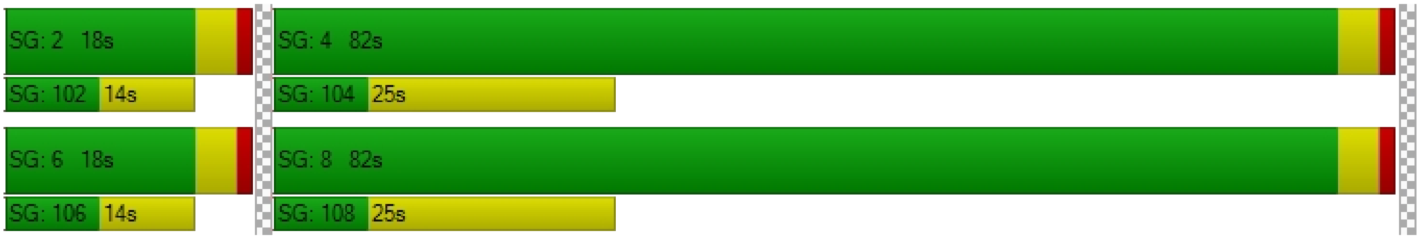
d_M, Delay for Movement [s/veh]	3.54	2.02	2.02	2.77	2.41	2.41	47.96	47.96	47.96	44.37	44.37	44.37
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.06			2.41			47.96			44.37		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.54											
Intersection LOS	A											
Intersection V/C	0.387											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.709	2.751	1.817	1.768
Crosswalk LOS	B	C	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.248	2.470	1.735	1.639
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	40	462	99	163	731	73	74	222	60	193	329	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	462	99	163	731	73	74	222	60	193	329	209
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	124	27	50	226	23	20	61	16	58	98	62
Total Analysis Volume [veh/h]	43	496	106	201	904	90	81	243	66	230	392	249
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	37	0	19	56	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	48	59	59	59	33	33	33	33	33	33
g / C, Green / Cycle	0.48	0.48	0.48	0.59	0.59	0.59	0.33	0.33	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.07	0.17	0.17	0.21	0.25	0.06	0.10	0.08	0.09	0.21	0.18	0.18
s, saturation flow rate [veh/h]	616	1870	1758	972	3560	1589	788	1870	1736	1070	1870	1630
c, Capacity [veh/h]	266	891	837	594	2105	940	198	615	571	336	615	536
d1, Uniform Delay [s]	25.29	16.43	16.45	10.18	11.20	8.86	39.27	24.61	24.67	36.12	27.57	27.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.12	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.30	1.07	1.15	1.54	0.64	0.20	1.34	0.22	0.24	2.67	0.79	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.16	0.35	0.35	0.34	0.43	0.10	0.41	0.26	0.26	0.68	0.56	0.56
d, Delay for Lane Group [s/veh]	26.60	17.50	17.60	11.72	11.84	9.06	40.62	24.83	24.91	38.79	28.37	28.49
Lane Group LOS	C	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.84	4.58	4.35	2.17	5.31	0.86	1.92	2.77	2.64	5.54	6.75	5.91
50th-Percentile Queue Length [ft/ln]	21.06	114.42	108.85	54.22	132.68	21.48	48.02	69.13	66.11	138.47	168.64	147.71
95th-Percentile Queue Length [veh/ln]	1.52	8.09	7.78	3.90	9.09	1.55	3.46	4.98	4.76	9.40	11.01	9.89
95th-Percentile Queue Length [ft/ln]	37.91	202.13	194.40	97.60	227.14	38.66	86.43	124.44	118.99	234.96	275.13	247.37

Movement, Approach, & Intersection Results

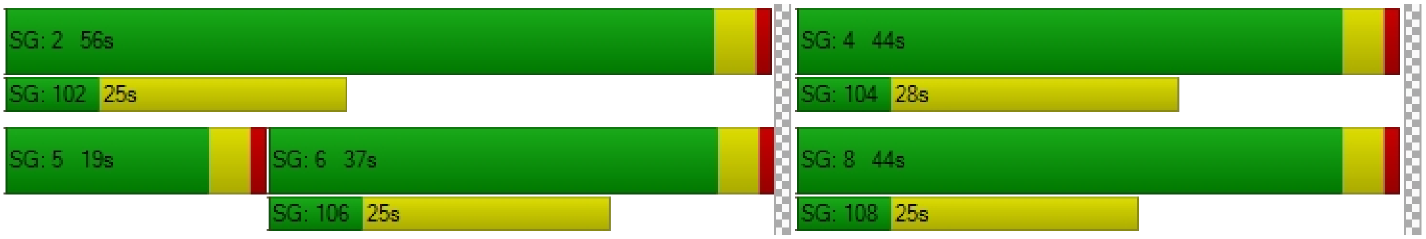
d_M, Delay for Movement [s/veh]	26.60	17.54	17.60	11.72	11.84	9.06	40.62	24.86	24.91	38.79	28.38	28.49
Movement LOS	C	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	18.15			11.61			28.14			31.16		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.54											
Intersection LOS	C											
Intersection V/C	0.533											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.992	2.901	2.544	2.724
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	660	1040	800	800
d_b, Bicycle Delay [s]	22.45	11.52	18.00	18.00
I_b,int, Bicycle LOS Score for Intersection	2.092	2.545	1.881	2.278
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	22	49	43	22	33	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	49	43	22	33	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	22	15	8	11	5
Total Analysis Volume [veh/h]	40	88	59	30	46	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	955	831	831
Degree of Utilization, x	0.13	0.11	0.08

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	0.36	0.26
95th-Percentile Queue Length [ft]	11.55	8.97	6.56
Approach Delay [s/veh]	7.35	7.86	7.71
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.59		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		↔	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	10	39	38	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	39	38	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	18	13	6	12	2
Total Analysis Volume [veh/h]	18	70	52	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.74	8.90
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft/ln]	0.90	0.90	0.00	0.00	5.20	5.20
d_A, Approach Delay [s/veh]	1.51		0.00		9.63	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.01					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	3	19	38	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	19	38	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	6	13	5	7	3
Total Analysis Volume [veh/h]	4	25	53	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	0.00	9.17	8.77
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft/ln]	0.20	0.20	0.00	0.00	3.39	3.39
d_A, Approach Delay [s/veh]	1.02		0.00		9.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.78					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.121

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	34	0	328	10	0	280	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	34	0	328	10	0	280	17
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	21	0	0	15	0	91	3	0	81	5
Total Analysis Volume [veh/h]	0	0	82	0	0	61	0	362	11	0	326	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.04	0.00	0.00	10.58	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.41	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	10.26	0.00	0.00	7.07	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.04			10.58			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.80											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	5.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.393

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			59th Street			59 Street		
Base Volume Input [veh/h]	32	1015	27	39	909	45	22	1	50	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	1015	27	39	909	45	22	1	50	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	276	7	10	238	12	7	0	17	6	1	9
Total Analysis Volume [veh/h]	35	1102	29	41	953	47	30	1	68	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	82	0	0	82	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.30	0.08	0.27	0.27	0.06	0.04
s, saturation flow rate [veh/h]	563	1870	1853	498	1870	1839	1715	1660
c, Capacity [veh/h]	502	1584	1569	447	1584	1558	172	171
d1, Uniform Delay [s]	2.98	1.68	1.68	3.32	1.60	1.60	45.49	44.52
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	0.63	0.64	0.41	0.53	0.54	3.01	1.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.36	0.36	0.09	0.32	0.32	0.57	0.35
d, Delay for Lane Group [s/veh]	3.24	2.32	2.32	3.72	2.13	2.14	48.49	45.75
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.17	1.38	1.37	0.23	1.17	1.15	2.56	1.50
50th-Percentile Queue Length [ft/ln]	4.35	34.52	34.28	5.68	29.13	28.75	64.11	37.39
95th-Percentile Queue Length [veh/ln]	0.31	2.49	2.47	0.41	2.10	2.07	4.62	2.69
95th-Percentile Queue Length [ft/ln]	7.83	62.13	61.71	10.22	52.43	51.75	115.39	67.31

Movement, Approach, & Intersection Results

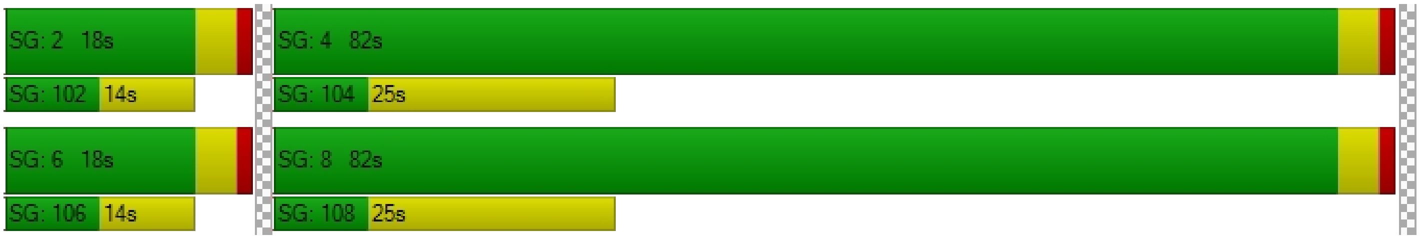
d_M, Delay for Movement [s/veh]	3.24	2.32	2.32	3.72	2.14	2.14	48.49	48.49	48.49	45.75	45.75	45.75
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.35			2.20			48.49			45.75		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.31											
Intersection LOS	A											
Intersection V/C	0.393											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.767	2.778	1.844	1.831
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	280	280	1560	1560
d_b, Bicycle Delay [s]	36.98	36.98	2.42	2.42
I_b,int, Bicycle LOS Score for Intersection	2.522	2.418	1.723	1.659
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.653

Intersection Setup

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↑↱			↰ ↑ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Ave			Atlantic Ave			South Street			South Street		
Base Volume Input [veh/h]	92	797	162	285	615	75	79	365	44	165	273	169
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	797	162	285	615	75	79	365	44	165	273	169
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	225	46	76	164	20	20	95	11	45	74	46
Total Analysis Volume [veh/h]	104	900	183	304	656	80	82	378	46	180	297	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	39	0	24	63	0	0	37	0	0	37	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	46	46	60	60	60	32	32	32	32	32	32
g / C, Green / Cycle	0.46	0.46	0.46	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.13	0.30	0.30	0.39	0.18	0.05	0.09	0.12	0.12	0.19	0.14	0.14
s, saturation flow rate [veh/h]	777	1870	1762	787	3560	1589	914	1870	1800	963	1870	1635
c, Capacity [veh/h]	339	851	802	460	2146	958	244	594	571	272	594	519
d1, Uniform Delay [s]	24.85	21.14	21.17	15.86	9.68	8.31	36.20	26.33	26.36	38.57	26.98	27.03
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.13	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.33	3.91	4.17	7.28	0.37	0.17	0.80	0.37	0.39	3.40	0.49	0.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.65	0.66	0.66	0.31	0.08	0.34	0.36	0.37	0.66	0.43	0.44
d, Delay for Lane Group [s/veh]	27.18	25.05	25.34	23.14	10.05	8.49	37.00	26.70	26.75	41.97	27.47	27.61
Lane Group LOS	C	C	C	C	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.06	10.62	10.10	3.91	3.38	0.73	1.83	3.97	3.87	4.49	4.83	4.30
50th-Percentile Queue Length [ft/ln]	51.47	265.53	252.57	97.84	84.56	18.28	45.69	99.34	96.63	112.30	120.87	107.56
95th-Percentile Queue Length [veh/ln]	3.71	15.97	15.32	7.04	6.09	1.32	3.29	7.15	6.96	7.97	8.44	7.70
95th-Percentile Queue Length [ft/ln]	92.64	399.15	382.88	176.12	152.20	32.90	82.24	178.81	173.93	199.20	211.02	192.60

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.18	25.16	25.34	23.14	10.05	8.49	37.00	26.72	26.75	41.97	27.49	27.61
Movement LOS	C	C	C	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	25.36			13.76			28.39			31.47		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	23.45											
Intersection LOS	C											
Intersection V/C	0.653											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.964	2.933	2.645	2.808
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	1180	660	660
d_b, Bicycle Delay [s]	21.13	8.41	22.45	22.45
I_b,int, Bicycle LOS Score for Intersection	2.539	2.418	1.977	2.105
Bicycle LOS	B	B	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

]

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.152

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (North)	
Base Volume Input [veh/h]	34	32	20	27	58	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	32	20	27	58	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	10	6	8	20	13
Total Analysis Volume [veh/h]	44	42	23	31	81	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	902	819	874
Degree of Utilization, x	0.10	0.07	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	0.21	0.54
95th-Percentile Queue Length [ft]	7.88	5.28	13.39
Approach Delay [s/veh]	7.41	7.71	7.86
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.69		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Linden Ave		Linden Ave		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↰		↱		⊤	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		59th Street (South)	
Base Volume Input [veh/h]	9	47	47	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	47	47	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	15	14	11	9	0
Total Analysis Volume [veh/h]	12	61	54	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	0.00	9.57	8.85
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.61	0.61	0.00	0.00	3.33	3.33
d_A, Approach Delay [s/veh]	1.22		0.00		9.57	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Linden Ave		Linden Ave		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Hullet Street	
Base Volume Input [veh/h]	4	45	27	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	45	27	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	12	4	6	1
Total Analysis Volume [veh/h]	6	64	49	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.35	0.00	0.00	0.00	9.34	8.71
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.58	2.58
d_A, Approach Delay [s/veh]	0.63		0.00		9.28	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.097

Intersection Setup

Name	Linden Ave			Linden Ave			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			┣			┣		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Ave			Linden Ave			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	20	0	355	5	0	356	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	20	0	355	5	0	356	46
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	107	2	0	95	12
Total Analysis Volume [veh/h]	0	0	61	0	0	25	0	426	6	0	380	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.37	0.00	0.00	10.80	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.32	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	8.06	0.00	0.00	3.01	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.37			10.80			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.02											
Intersection LOS	B											

APPENDIX C-VIII

YEAR 2024 CUMULATIVE PLUS PROJECT WITH "COMPLETE STREETS" IMPROVEMENTS TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			✛			✛		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	21	565	7	12	732	19	37	0	57	11	3	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	565	7	12	732	19	37	0	57	11	3	28
Peak Hour Factor	0.8810	0.8810	0.8810	0.8580	0.8580	0.8580	0.8860	0.8860	0.8860	0.8750	0.8750	0.8750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	160	2	3	213	6	10	0	16	3	1	8
Total Analysis Volume [veh/h]	24	641	8	14	853	22	42	0	64	13	3	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	89	89	89	89	8	8
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.04	0.35	0.02	0.47	0.06	0.03
s, saturation flow rate [veh/h]	633	1866	782	1862	1667	1713
c, Capacity [veh/h]	500	1576	645	1573	180	179
d1, Uniform Delay [s]	5.56	1.94	3.72	2.39	47.35	45.82
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.80	0.06	1.43	3.07	0.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.41	0.02	0.56	0.59	0.27
d, Delay for Lane Group [s/veh]	5.74	2.74	3.78	3.81	50.42	46.61
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.19	1.97	0.08	3.31	2.88	1.24
50th-Percentile Queue Length [ft/ln]	4.63	49.23	1.98	82.76	72.12	30.90
95th-Percentile Queue Length [veh/ln]	0.33	3.54	0.14	5.96	5.19	2.22
95th-Percentile Queue Length [ft/ln]	8.33	88.61	3.57	148.98	129.82	55.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.74	2.74	2.74	3.78	3.81	3.81	50.42	50.42	50.42	46.61	46.61	46.61
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	2.84			3.81			50.42			46.61		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.51											
Intersection LOS	A											
Intersection V/C	0.578											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.548	2.589	1.819	1.770
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	2.670	3.026	1.735	1.639
Bicycle LOS	B	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	23.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	40	370	99	163	585	73	74	222	60	193	329	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	370	99	163	585	73	74	222	60	193	329	209
Peak Hour Factor	0.9310	0.9310	0.9310	0.8090	0.8090	0.8090	0.9120	0.9120	0.9120	0.8390	0.8390	0.8390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	99	27	50	181	23	20	61	16	58	98	62
Total Analysis Volume [veh/h]	43	397	106	201	723	90	81	243	66	230	392	249
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	40	0	21	61	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	51	51	63	63	63	34	34	34	34	34	34
g / C, Green / Cycle	0.49	0.49	0.49	0.60	0.60	0.60	0.32	0.32	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.07	0.18	0.39	0.06	0.10	0.08	0.09	0.21	0.18	0.18
s, saturation flow rate [veh/h]	730	1870	1589	1110	1870	1589	788	1870	1736	1070	1870	1630
c, Capacity [veh/h]	223	910	774	627	1119	951	193	609	565	330	609	531
d1, Uniform Delay [s]	34.74	17.55	14.81	10.87	13.82	8.98	41.55	26.09	26.15	38.21	29.23	29.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.14	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.93	1.52	0.37	1.35	2.89	0.20	1.46	0.22	0.25	3.37	0.82	0.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.19	0.44	0.14	0.32	0.65	0.09	0.42	0.26	0.27	0.70	0.56	0.56
d, Delay for Lane Group [s/veh]	36.67	19.07	15.18	12.22	16.71	9.18	43.01	26.31	26.40	41.58	30.04	30.18
Lane Group LOS	D	B	B	B	B	A	D	C	C	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.04	6.46	1.45	2.23	11.29	0.89	2.04	2.94	2.81	5.93	7.18	6.29
50th-Percentile Queue Length [ft/ln]	25.95	161.53	36.22	55.81	282.22	22.33	50.96	73.57	70.35	148.20	179.43	157.15
95th-Percentile Queue Length [veh/ln]	1.87	10.63	2.61	4.02	16.80	1.61	3.67	5.30	5.06	9.92	11.57	10.40
95th-Percentile Queue Length [ft/ln]	46.70	265.75	65.19	100.45	419.98	40.20	91.72	132.42	126.62	248.03	289.28	259.94

Movement, Approach, & Intersection Results

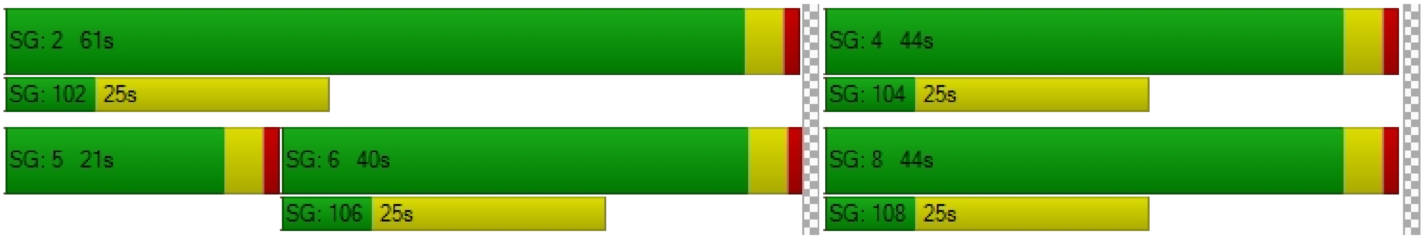
d_M, Delay for Movement [s/veh]	36.67	19.07	15.18	12.22	16.71	9.18	43.01	26.34	26.40	41.58	30.06	30.18
Movement LOS	D	B	B	B	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	19.70			15.15			29.81			33.13		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	23.61											
Intersection LOS	C											
Intersection V/C	0.679											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.939	2.762	2.547	2.729
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	686	1086	762	762
d_b, Bicycle Delay [s]	22.67	10.97	20.12	20.12
I_b,int, Bicycle LOS Score for Intersection	2.461	3.233	1.881	2.278
Bicycle LOS	B	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	22	49	43	22	33	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	49	43	22	33	15
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.7190	0.7190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	22	15	8	11	5
Total Analysis Volume [veh/h]	40	88	59	30	46	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	955	831	831
Degree of Utilization, x	0.13	0.11	0.08

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	0.36	0.26
95th-Percentile Queue Length [ft]	11.55	8.97	6.56
Approach Delay [s/veh]	7.35	7.86	7.71
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.59		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	10	39	38	17	32	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	39	38	17	32	5
Peak Hour Factor	0.5560	0.5560	0.7310	0.7310	0.6880	0.6880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	18	13	6	12	2
Total Analysis Volume [veh/h]	18	70	52	23	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.74	8.90
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft/ln]	0.90	0.90	0.00	0.00	5.20	5.20
d_A, Approach Delay [s/veh]	1.51		0.00		9.63	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.01					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	3	19	38	14	20	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	19	38	14	20	7
Peak Hour Factor	0.7500	0.7500	0.7190	0.7190	0.6670	0.6670
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	6	13	5	7	3
Total Analysis Volume [veh/h]	4	25	53	19	30	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	0.00	9.17	8.77
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft/ln]	0.20	0.20	0.00	0.00	3.39	3.39
d_A, Approach Delay [s/veh]	1.02		0.00		9.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.78					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.121

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	34	0	328	10	0	280	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	34	0	328	10	0	280	17
Peak Hour Factor	1.0000	1.0000	0.5830	1.0000	1.0000	0.5560	1.0000	0.9060	0.9060	1.0000	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	21	0	0	15	0	91	3	0	81	5
Total Analysis Volume [veh/h]	0	0	82	0	0	61	0	362	11	0	326	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.04	0.00	0.00	10.58	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.41	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	10.26	0.00	0.00	7.07	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.04			10.58			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.80											
Intersection LOS	B											

Intersection Level Of Service Report

Intersection 1: Atlantic Avenue at 59th Street

Control Type:	Signalized	Delay (sec / veh):	7.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑↱			↰ ↑↱			↰↑↱			↰↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			59th Street			59th Street		
Base Volume Input [veh/h]	32	811	27	39	726	45	22	1	50	14	2	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	811	27	39	726	45	22	1	50	14	2	22
Peak Hour Factor	0.9210	0.9210	0.9210	0.9540	0.9540	0.9540	0.7380	0.7380	0.7380	0.6330	0.6330	0.6330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	220	7	10	190	12	7	0	17	6	1	9
Total Analysis Volume [veh/h]	35	881	29	41	761	47	30	1	68	22	3	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	18	0	0	18	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	7	0	0	7	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	89	89	89	89	8	8
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.05	0.49	0.07	0.44	0.06	0.04
s, saturation flow rate [veh/h]	674	1860	613	1851	1708	1643
c, Capacity [veh/h]	547	1582	486	1575	169	166
d1, Uniform Delay [s]	4.69	2.28	5.72	2.07	47.80	46.78
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	1.53	0.34	1.20	3.20	1.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.58	0.08	0.51	0.59	0.36
d, Delay for Lane Group [s/veh]	4.91	3.81	6.06	3.26	51.00	48.09
Lane Group LOS	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.24	3.25	0.33	2.60	2.71	1.58
50th-Percentile Queue Length [ft/ln]	6.01	81.26	8.18	64.97	67.66	39.46
95th-Percentile Queue Length [veh/ln]	0.43	5.85	0.59	4.68	4.87	2.84
95th-Percentile Queue Length [ft/ln]	10.82	146.26	14.72	116.95	121.80	71.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.91	3.81	3.81	6.06	3.26	3.26	51.00	51.00	51.00	48.09	48.09	48.09
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.85			3.40			51.00			48.09		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.40											
Intersection LOS	A											
Intersection V/C	0.593											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft^2/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.607	2.619	1.847	1.834
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1581	1581
d_b, Bicycle Delay [s]	39.43	39.43	2.30	2.30
I_b,int, Bicycle LOS Score for Intersection	3.119	2.960	1.723	1.659
Bicycle LOS	C	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 2: Atlantic Avenue at South Street

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↑↱			↰ ↑ ↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Atlantic Avenue			Atlantic Avenue			South Street			South Street		
Base Volume Input [veh/h]	92	637	162	285	492	75	79	365	44	165	273	169
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	637	162	285	492	75	79	365	44	165	273	169
Peak Hour Factor	0.8860	0.8860	0.8860	0.9370	0.9370	0.9370	0.9650	0.9650	0.9650	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	180	46	76	131	20	20	95	11	45	74	46
Total Analysis Volume [veh/h]	104	719	183	304	525	80	82	378	46	180	297	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	61	0	10	71	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	57	57	67	67	67	30	30	30	30	30	30
g / C, Green / Cycle	0.54	0.54	0.54	0.64	0.64	0.64	0.29	0.29	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.12	0.38	0.12	0.35	0.28	0.05	0.09	0.12	0.12	0.19	0.14	0.14
s, saturation flow rate [veh/h]	877	1870	1589	860	1870	1589	914	1870	1800	963	1870	1635
c, Capacity [veh/h]	401	1013	861	437	1193	1014	208	534	514	235	534	467
d1, Uniform Delay [s]	23.00	17.90	12.45	15.97	9.56	7.24	41.44	30.26	30.30	44.08	31.01	31.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.20	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.57	4.20	0.56	8.88	1.18	0.15	1.21	0.49	0.52	9.04	0.66	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.26	0.71	0.21	0.70	0.44	0.08	0.39	0.40	0.41	0.77	0.48	0.48
d, Delay for Lane Group [s/veh]	24.56	22.10	13.01	24.85	10.74	7.39	42.65	30.75	30.81	53.13	31.67	31.85
Lane Group LOS	C	C	B	C	B	A	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.97	13.40	2.30	3.89	5.99	0.69	2.04	4.44	4.31	5.29	5.40	4.81
50th-Percentile Queue Length [ft/ln]	49.27	335.11	57.46	97.22	149.76	17.23	50.93	110.89	107.87	132.29	134.98	120.15
95th-Percentile Queue Length [veh/ln]	3.55	19.41	4.14	7.00	10.00	1.24	3.67	7.89	7.72	9.06	9.21	8.40
95th-Percentile Queue Length [ft/ln]	88.69	485.22	103.43	175.00	250.12	31.01	91.68	197.24	193.03	226.61	230.25	210.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.56	22.10	13.01	24.85	10.74	7.39	42.65	30.78	30.81	53.13	31.70	31.85
Movement LOS	C	C	B	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	20.70			15.16			32.70			37.58		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	24.66											
Intersection LOS	C											
Intersection V/C	0.730											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.08	42.08	42.08	42.08
I_p,int, Pedestrian LOS Score for Intersection	2.906	2.793	2.648	2.847
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1086	1276	571	571
d_b, Bicycle Delay [s]	10.97	6.88	26.79	26.79
I_b,int, Bicycle LOS Score for Intersection	3.220	3.059	1.977	2.105
Bicycle LOS	C	C	A	B

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Linden Avenue at 59th Street (North)

Control Type:	All-way stop	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.152

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (North)	
Base Volume Input [veh/h]	34	32	20	27	58	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	32	20	27	58	37
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.7160	0.7160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	10	6	8	20	13
Total Analysis Volume [veh/h]	44	42	23	31	81	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	902	819	874
Degree of Utilization, x	0.10	0.07	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	0.21	0.54
95th-Percentile Queue Length [ft]	7.88	5.28	13.39
Approach Delay [s/veh]	7.41	7.71	7.86
Approach LOS	A	A	A
Intersection Delay [s/veh]	7.69		
Intersection LOS	A		

Intersection Level Of Service Report
Intersection 4: Linden Avenue at 59th Street (South)

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┤		├		┬	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		59th Street (South)	
Base Volume Input [veh/h]	9	47	47	39	19	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	47	47	39	19	0
Peak Hour Factor	0.7710	0.7710	0.8640	0.8640	0.5360	0.5360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	15	14	11	9	0
Total Analysis Volume [veh/h]	12	61	54	45	35	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	0.00	9.57	8.85
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.61	0.61	0.00	0.00	3.33	3.33
d_A, Approach Delay [s/veh]	1.22		0.00		9.57	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Linden Avenue at Hullet Street

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Linden Avenue		Linden Avenue		Hullet Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Avenue		Linden Avenue		Hullet Street	
Base Volume Input [veh/h]	4	45	27	9	15	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	45	27	9	15	2
Peak Hour Factor	0.7000	0.7000	0.5500	0.5500	0.5830	0.5830
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	12	4	6	1
Total Analysis Volume [veh/h]	6	64	49	16	26	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	7.35	0.00	0.00	0.00	9.34	8.71
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.29	0.29	0.00	0.00	2.58	2.58
d_A, Approach Delay [s/veh]	0.63		0.00		9.28	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 6: Linden Avenue at South Street

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.097

Intersection Setup

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			↱			↑↱			↑↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Linden Avenue			Linden Avenue			South Street			South Street		
Base Volume Input [veh/h]	0	0	48	0	0	20	0	355	5	0	356	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	48	0	0	20	0	355	5	0	356	46
Peak Hour Factor	1.0000	1.0000	0.7920	1.0000	1.0000	0.8000	1.0000	0.8330	0.8330	1.0000	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	15	0	0	6	0	107	2	0	95	12
Total Analysis Volume [veh/h]	0	0	61	0	0	25	0	426	6	0	380	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.37	0.00	0.00	10.80	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			B		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.32	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	8.06	0.00	0.00	3.01	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.37			10.80			0.00			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.02											
Intersection LOS	B											

APPENDIX D

PROJECT DRIVEWAY LEVEL OF SERVICE CALCULATION WORKSHEETS

Intersection Level Of Service Report

Intersection 7: Linden Ave at Project Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Linden Ave		Linden Ave		Project Driveway 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	┣		┫		┳	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Project Driveway 1	
Base Volume Input [veh/h]	32	7	9	39	13	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	7	9	39	13	15
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	2	2	10	3	4
Total Analysis Volume [veh/h]	34	7	9	41	14	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	7.31	0.00	9.13	8.60
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.02	0.02	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.43	0.43	2.40	2.40
d_A, Approach Delay [s/veh]	0.00		1.32		8.85	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.74					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 7: Linden Ave at Project Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name	Linden Ave		Linden Ave		Project Driveway 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↱		↰		↔	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Linden Ave		Linden Ave		Project Driveway 1	
Base Volume Input [veh/h]	47	14	16	28	8	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	14	16	28	8	10
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	4	4	7	2	3
Total Analysis Volume [veh/h]	49	15	17	29	8	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	7.37	0.00	9.23	8.64
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.03	0.03	0.06	0.06
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.84	0.84	1.54	1.54
d_A, Approach Delay [s/veh]	0.00		2.72		8.89	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.28					
Intersection LOS	A					