MISSION LINEN
6590 CENTRAL AVENUE
AIR QUALITY AND GREENHOUSE GAS EMISSIONS ASSESSMENT
NEWARK, CALIFORNIA

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Project: 14-096

Introduction

This report addresses air quality and greenhouse gas emissions impacts associated with the proposed Mission Linen project in the City of Newark. The project would involve the demolition of an existing 63,191 square foot (s.f.) building and the development of a new 109,046 s.f. industrial linen facility. The project would change travel patterns in the area and water and energy consumption that would affect air pollutant and greenhouse gas emissions. In addition, construction of the project would emit air pollutants and greenhouse gases. This analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Setting

The project is located in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and Federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$).

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. Highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant in the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The climate of Newark is characterized by warm dry summers and cool moist winters. The proximity of the San Francisco Bay and Pacific Ocean has a moderating influence on the climate. Newark is located in the climate sub region of the Bay Area known as Southwestern Alameda County.

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[1] BAAQMD, 2011. *BAAQMD CEQA Air Quality Guidelines*. May.

The major large-scale weather feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is strongest during summer and located off the west coast of the United States.

Precipitation is generally lowest along the Bay with much higher amounts occurring along south and west facing slopes. Newark, which lies adjacent to the Bay, receives about 20 inches of precipitation. About 90 percent of this rainfall occurs from November through April. High-pressure systems are also common in winter and can produce cool stagnant conditions. Fog and haze are common during winter when high-pressure systems influence the weather

The proximity of the eastern Pacific High and relatively lower pressure inland produces a prevailing westerly sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other topographical gaps, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. Newark is mostly flat, with the southern extent of the Bay to the west and mountains to the east. Marine air penetrates from the Bay; however, it is moderated by bayside conditions as it reaches Newark. The prevailing wind is primarily from the northwest, especially during spring and summer. In winter, winds become variable with more of a southeasterly orientation. Nocturnal winds and land breezes during the colder months of the year prevail with variable drainage out of the mountainous areas. Wind speeds are highest during the spring and early summer and lightest in fall. Winter storms bring relatively short episodes of strong southerly winds.

Temperatures in Newark tend to be less extreme compared to inland locations due to the moderating effect of the Pacific Ocean and the Bay. In summer, high temperatures are generally in the high 70's, and in the 50's during winter. Low temperatures range from the 50's in summer to the 30's in winter.

During the fall and winter months, the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. Fair weather and very warm temperatures are common to the Bay Area with this weather pattern. This condition frequently produces poor atmospheric mixing that results in degraded regional air quality. Ozone standards traditionally are exceeded when this condition occurs during the warmer months of the year.

National and State Ambient Air Quality Standards

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

As required by the Federal Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter, including respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$), sulfur oxides, and lead. Pursuant to the California Clean Air Act, the State of California has established the California Ambient Air Quality Standards (CAAQS). Relevant State and Federal standards are summarized in Table 1. CAAQS are generally the same or more stringent than NAAQS.

Table 1. Relevant California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147µg/m^3)
	1-hour	0.09 ppm (180 µg/m^3)	—
Carbon monoxide	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen dioxide	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	Annual	—	0.03 ppm (56 µg/m^3)
Particulate Matter (PM_{10})	Annual	20 µg/m^3	—
	24-hour	50 µg/m^3	150 µg/m^3
Particulate Matter ($PM_{2.5}$)	Annual	12 µg/m^3	12 µg/m^3
	24-hour	—	35 µg/m^3

Notes: ppm = parts per million mg/m3 = milligrams per cubic meter µg/m^3 = micrograms per cubic meter

Sensitive Receptors and Toxic Air Contaminants

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors are residences located to the north of the project construction site on the west side of Cherry Street north of Central Avenue (see Figure 1).

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and Federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of diesel particulate matter (DPM). Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.[2] The regulation requires affected vehicles to meet specific performance requirements between 2012 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, CARB (a part of the California Environmental Protection Agency) oversees regional air district activities and regulates air quality at the State level. The BAAQMD published CEQA Air Quality Guidelines are used in this assessment to evaluate air quality impacts of projects.[3]

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[2] Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed: July 31, 2012.
[3] BAAQMD, 2011, op. cit.

Greenhouse Gases

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO_2) and water vapor, but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2 and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.
- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger with a GWP of 23,900 (one hundred year). Methane and nitrous oxide have GWPs of 21 and 310, respectively.[4] In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of equivalent CO_2 (CO_2e).

An expanding body of scientific research supports the theory that global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California could be adversely affected by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-

[4] These are the GWP values used for methane and nitrous oxide in the California Emissions Estimator Model (CalEEMod) version 2013.2.2, a land use development air quality emissions model recommended for use by BAAQMD. The model used GWP values from the IPCC Second Assessment Report (SAR), since it was the basis used in regulations and international protocols at the time (e.g., California and Federal GHG Reporting Programs, The Climate Registry). SAR available online:
https://www.ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_report.pdf

sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011). The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). Therefore, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

Table 2. Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	10 per one million		
Chronic or Acute Hazard Index	1.0		
Incremental annual average $PM_{2.5}$	0.3 $\mu g/m^3$		
Health Risks and Hazards for Sensitive Receptors (Cumulative from all sources within 1,000 foot zone of influence) and Cumulative Thresholds for New Sources			
Excess Cancer Risk	100 per one million		
Chronic Hazard Index	10.0		
Annual Average $PM_{2.5}$	0.8 $\mu g/m^3$		
Greenhouse Gas Emissions			
GHG Annual Emissions	1,100 metric tons or 4.6 metric tons per capita per year		
Stationary Sources	10,000 metric tons per year		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (μm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5μm or less; and GHG = greenhouse gas.

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan? ***Less than significant***

The most recent clean air plan is the *Bay Area 2010 Clean Air Plan* (Clean Air Plan) that was adopted by BAAQMD in September 2010. This plan addresses air quality impacts with respect to obtaining ambient air quality standards for non-attainment pollutants (i.e., ozone and particulate matter or PM_{10} and $PM_{2.5}$), reducing exposure of sensitive receptors to TACs, and reducing greenhouse gas emissions such that the region can meet AB 32 goals of reducing emissions to 1990 levels by 2020.

Emissions of non-attainment criteria air pollutants are addressed under Impacts 2 and 3. Exposure of existing sensitive receptors is addressed under Impact 4.

Clean Air Plan Projections

The consistency of the proposed project with the Clean Air Plan is primarily a question of maintaining consistency with the population/employment assumptions utilized in the CAP. Changes that would affect the CAP's underlying assumptions (e.g., increases in employment or population), could increase emission projections. Because the proposed project does not include a change to the City's General Plan or rezoning, the assumption made under the CAP will not be changed. The proposed project would not substantially affect population or traffic forecasts, therefore, the project is consistent with the Clean Air Plan.

Consistency with Clean Air Plan Control Measures

The CAP includes emissions control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided in to five categories that include:

- Measures to reduce stationary and area sources;
- Mobile source measures;
- Transportation control measures;
- Land use and local impact measures; and
- Energy and climate measures

In developing the control measures, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to address emissions. Implementation of each control measure will rely on some combination of the following:

- Adoption and enforcement of rules to reduce emissions from stationary sources, area sources, and indirect sources;
- Revisions to BAAQMD's permitting requirements for stationary sources;
- Enforcement of CARB rules to reduce emissions from heavy-duty diesel engines;

- Allocation of grants and other funding by the Air District and/or partner agencies;
- Promotion of best policies and practices that can be implemented by local agencies through guidance documents, model ordinances, etc.;
- Partnerships with local governments, other public agencies, the business community, non-profits, etc.;
- Public outreach and education;
- Enhanced air quality monitoring;
- Development of land use guidance and CEQA guidelines, and Air District review and comment on Bay Area projects pursuant to CEQA; and
- Leadership and advocacy.

This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. The proposed project is consistent with the existing General Plan land use designations and would not require a General Plan Amendment.

Stationary and Area Source Control Measures

The CAP includes Stationary Source Control measures that BAAQMD adopts as rules or regulations through their authority to control emissions from stationary and area sources. The BAAQMD is the implementing agency, since these control measures are applicable to sources of air pollution that must obtain District permits. Any new stationary sources would be required to obtain proper permits through BAAQMD. In addition, the City uses BAAQMD's CEQA Air Quality Guidelines to evaluate air pollutant emissions from new sources.

The proposed project would establish new sources of particulate matter and gaseous emissions. Emissions would primarily result from natural gas fired boilers and dryers used by the project. The project would also generate emissions from vehicles traveling to and from the project site.

Certain emission sources would be subject to BAAQMD Regulations and Rules. The District's rules and regulations that may apply to the project include:

- Regulation 2 – Permits
  - Rule 2-1: General Requirements
  - Rule 2-2: New Source Review
  - Rule 5: New Source Review of Toxic Air Contaminants
- Regulation 6 – Particulate Matter and Visible Emissions
  - Rule 1: General Requirements
- Regulation 9 – Inorganic Gaseous Pollutants
  - Rule 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters

Permits – Regulation 2-1-301 requires that any person installing, modifying, or replacing any equipment, the use of which may reduce or control the emission of air contaminants, shall first obtain an authority to construct (ATC). Regulation 2-1-302 requires that written authorization from the BAAQMD in the form of a permit to operate (PTO) be secured before any equipment is used or operated.

Regulation 2-1-114 lists sources that are exempt from permitting. For external combustion equipment such as boilers and dryers, sources with a rated heat input of less than 1 MMBtu per hour and sources with a rated heat input of less than 10 MMBtu per hour that are fired exclusively on natural gas are exempt from the permitting requirements of 2-1-301 and 302.

At the proposed facility, a number of the dryers and the garment finishing tunnel would meet the exemption conditions and are expected to be exempt from permitting. However, the boilers would be subject to permitting requirements.

New Source Review - Regulation 2-2, New Source Review (NSR), applies to all new and modified sources or facilities that are subject to the requirements of Rule 2-1-301. The purpose of the rule is to provide for review of such sources and to provide mechanisms by which no net increase in emissions will result.

Regulation 2-2-301 requires that an applicant for an Authority to Construct or Permit to Operate apply best available control technology (BACT) to any new or modified source that results in an increase in emissions and has the potential to emit emissions (based on maximum operating conditions and equipment capacity) of precursor organic compounds (POC), non-precursor organic compounds (NPOC), NOx, or SO_2 of 10 pounds or more per highest day.

Based on the estimated emissions from the proposed project under maximum operating conditions (year 2021 operating schedule), BACT would not be required for any of the equipment since each source's emissions would be less than 10 pounds per day.

Offsets - Regulations 2-2-302 an 2-2-303 require that offsets be provided for a new or modified source that emits more than 10 tons per year of NO_x or precursor organic compounds. If the facility has potential emissions above 10 but below 35 tons per year of POC or NO_x, then the District shall provide the offsets from the Small Facility Bank, if the facility or its parent company doesn't already own emission reduction credits held in a Banking Certificate. For PM10, offsets will need to be provided if the cumulative increase in emissions is greater than 100 tons per year.

It is not expected that emissions of any pollutant would exceed the offset thresholds. Thus, it is not expected that offsets for the proposed project would be required.

New Source Review of *Toxic Air Contaminants* - Regulation 2-5 is designed to provide for the review of new and modified sources of TAC emissions in order to evaluate potential public exposure and health risk and to mitigate potentially significant health risks resulting from these exposures.

A source is exempt from the requirements of Regulation 2-5 if, for each toxic air contaminant emitted, the increase in emissions from the project is below the trigger levels listed in Table 2-5-1 of the regulation. Sources subject to this regulation are required to conduct a health risk screening analysis (HSRA) according to District guidelines. If a new or modified source of TACs has a cancer risk greater than 1.0 in one million and/or a chronic hazard index greater than 0.20 it is required to apply best available control technology for toxics (TBACT).

At maximum operating conditions and equipment capacity TAC emissions of formaldehyde would exceed the trigger levels specified in Table 2-5-1 and a HRSA would be required and TBACT would be required if the cancer risk is greater than 1.0 in one million. This would be determined by BAAQMD during the permit process.

Prohibitory Rules - Regulation 6 pertains to particulate matter and Regulation 9 addresses emissions of inorganic gaseous pollutants.

Regulation 6-1 provides general requirements for sources with emission of particulate matter. It includes limitations on opacity of the discharge from exhaust stacks, limitation on the concentration of particulate matter in exhaust gas, and allowable emission rates based on process rates for general operations.

The facility emission sources are expected to comply with the particulate matter requirements of this regulation.

Regulation 9-7 prescribes NOx and CO emission limits for boilers, steam generators, and process heaters. It also includes requirements for emission source testing, monitoring and recordkeeping of operating parameters and fuel use.

The proposed 19.95 MMBtu per hour boilers for the project would be fired exclusively on natural gas. The applicable emission limits for the rated heat input of these boilers are 15 parts per million by volume (15 ppmv), dry at 3 percent oxygen for NOx and 400 ppmv, dry at 3 percent oxygen for CO. The boiler would be designed to meet these emissions limits and would use an ultra low NOx burner to achieve NOx emissions below the required limits.

Mobile Source Measures

The CAP includes Mobile Source Measures that would reduce emissions by accelerating the replacement of older, dirtier vehicles and equipment through programs such as the BAAQMD's Vehicle Buy-Back and Smoking Vehicle Programs, and promoting advanced technology vehicles that reduce emissions. The implementation of these measures relies heavily upon incentive programs, such as the Carl Moyer Program and the Transportation Fund for Clean Air, to achieve voluntary emission reductions in advance of, or in addition to, CARB requirements. CARB has new regulations that require the replacement or retrofit of on-road trucks, construction equipment and other specific equipment that is diesel powered.

Transportation Control Measures

The CAP includes transportation control measures (TCMs) that are strategies meant to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. While most of the TCMs are implemented at the regional level (e.g., by MTC or Caltrans), there are measures that the CAP relies upon local communities to assist with implementation. In addition, the CAP includes land use measures and energy and climate measures where implementation is aided by proper land use planning decisions. The City's General Plan, with which the project is consistent, includes measures to reduce vehicle travel that are generally consistent with the CAP TCMs.

TAC Exposure

The CAP includes measures to reduce TAC exposure to sensitive receptors. The project site does not introduce any new sensitive receptors into the area, though it could expose existing receptors to TACs from construction activity and operation. The City, as Lead CEQA Agency, uses the BAAQMD CEQA Air Quality Thresholds to identify significant risks and develop appropriate mitigation measures. TAC exposure from construction and operational activities are addressed under Impact 4.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? ***Less than significant with construction- and operational-period mitigation***

The Bay Area is considered a non-attainment area for ground-level ozone and fine particulate matter ($PM_{2.5}$) under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}) under the California Clean Air Act, but not the Federal act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM_{10}, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NOx), PM_{10} and $PM_{2.5}$ and apply to both construction period and operational period impacts.

The California Emissions Estimator Model (CalEEMod) Version 2013.2.2 was used to predict emissions from construction of the site and operation of the project. The project land use types and size, and trip generation rate were input to CalEEMod. Emissions from natural gas combustion for all pollutants and sources were calculated using U.S. EPA emission factors for natural gas combustion. NO_X emissions from project boilers were calculated using emissions factors from the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Construction period emissions

CalEEMod provided annual emissions for construction. CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling and vendor traffic. The model default construction build-out scenario, including equipment list was based on the type and size of the project. The anticipated 63,191 s.f. for building demolition was entered into the model. *Attachment 1* includes the CalEEMod input and output values for construction emissions.

The proposed project land use was input into CalEEMod, which was 109,046 s.f. entered as "General Light Industry" on a 9-acre site.

Based on the type and size of the project, the modeling scenario assumes that the project would be built out over a period of approximately 15 months beginning in 2015, or an estimated 320 construction workdays. Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 3 shows average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 3, predicted project emissions would not exceed the BAAQMD significance thresholds.

Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. *Mitigation Measure 1 would implement BAAQMD-recommended best management practices.*

Table 3. Construction Period Emissions

Scenario	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction emissions (tons)	1.37 tons	5.18 tons	0.32 tons	0.30 tons
Average daily emissions (pounds)[1]	8.6 lbs.	32.4 lbs.	2.0 lbs.	1.9 lbs.
BAAQMD Thresholds (pounds per day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	**No**	**No**	**No**	**No**
Notes: [1] Assumes 320 workdays.				

Mitigation Measure AQ-1: Include measures to control dust and exhaust during construction.

During any construction ground disturbance, implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less than significant. The contractor shall implement the following Best Management Practices that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Operational Period Emissions

Operational air emissions from the project would be generated primarily from autos driven by future employees and from delivery and service trucks. Emissions would also be generated by stationary equipment, such as boilers and dryers that use natural gas. Evaporative emissions from architectural coatings and cleaning/maintenance products are other typical emissions from light industrial uses. CalEEMod was used to predict emissions from operation of the site for both the first full operational year (2017) and full build-out of the project (2021). The project land use type and size, anticipated energy use, and trip generation rate were input to CalEEMod. Stationary equipment emissions were calculated using emissions factors from the U.S. EPA and the SJVAPCD. Adjustments to the model are described below. Model output worksheets are included in *Attachment 1*.

Year of Analysis

CalEEMod uses CARB's EMFAC2011 mobile emission factors. Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates CalEEMod uses. The earliest full year the project could possibly be constructed and begin operating would be 2017. Use of the this date is considered conservative, as emissions associated with build-out later than 2017 would be lower. In addition, a full build-out 2021 model run was conducted. Project operations are expected to be five days a week (Monday through Friday or approximately 260 days per year) in 2017 and seven days a week in 2021.

Land Use Descriptions

The proposed land use and size was input to CalEEMod as 109,046 s.f. of "General Light Industrial." An existing run was also modeled to represent the current Mission Linen operations in Union City, which would close after the Newark project became operational. The existing Union City site was entered as 31,500 s.f. of "General Light Industrial."

Trip Generation Rates and Types

CalEEMod allows the user to enter specific trip generation rates. Omni Means provided the trip generation rate for the project and the existing Union City site, which were entered into the model. Model default trip types and distances were used.

Energy and Water Use

The project applicant provided anticipated electricity, natural gas, and water consumption projections. Project-specific electricity and water use were input to the model, whereas the model was used to calculate only emissions associated with Title 24 natural gas consumption. Natural gas consumption associated with proposed stationary equipment (i.e., non-Title 24 sources such as boilers, dryers, and the finishing tunnel) was calculated separate from the model, as described below. Separate significance thresholds for GHGs (*Impact 6*) exist for direct emissions from stationary equipment (i.e., natural gas combustion), which is why emissions were calculated in this manner. See *Attachment 2* for project-specific data. The 2013 Title 24 Building Standards recently became effective July 1, 2014 and are predicted to use 25 percent less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 standards that CalEEMod is based on.[5] Therefore, the CalEEMod runs were adjusted to account for the greater energy efficiency. By the nature of the model, these reductions must be included in the "mitigated" output. CalEEMod defaults for energy and water use were used for the Existing model run.

Stationary Equipment

The proposed project would include several stationary sources, such as boilers, dryers and garment finishing tunnel. All equipment would be fueled using natural gas. Emissions were calculated for two conditions during the project years 2017 and 2021. The first scenario, considered to be maximum operating conditions, assumed all the combustion sources would be operated at their maximum firing rates (i.e., at maximum equipment rated heat input) for applicant-specified hours of operation during 2017 and 2021. This is not a realistic scenario since the equipment firing cycles and rarely attains the maximum firing rate. The second scenario was for expected operating conditions in 2017 and 2021 based on applicant supplied natural gas use and hours of facility operation. These projections are based on historical records for similar equipment.

Emissions from the project boilers and garment finishing tunnel would be solely due to the combustion of natural gas. For the dryers, emissions would be due to natural gas combustion in addition to particulate matter (PM_{10} and $PM_{2.5}$) generated during the drying process. Particulate matter emissions from the dryers are from lint generated during the drying process that is not collected by dryer lint screens.

Emissions from natural gas combustion for all pollutants and sources were calculated using U.S. EPA emission factors for natural gas combustion, except for the NO_X emissions from the boilers.[6] Boiler NO_X emissions were calculated based on the use of ultra-low NO_X burners that would be included with the boilers. Particulate matter emissions from the dryers were calculated using an emission factor from the SJVAPCD based on emission source testing of similar dryers

[5] California Energy Commission, 2012. *2013 Building Energy Efficiency Standards FAQ*. May.
[6] U.S. Environmental Protection Agency, 1998. *AP-42 Section 1.4 Natural Gas Combustion*. July 1998.

and manufacturer particulate mater control efficiencies for lint screens.[7] Details of the emission calculations are provided in *Attachment 3*.

Table 4 reports the predicted average daily 2017 operational net emissions and Table 5 reports 2017 annual net emissions. Table 6 reports the predicted average daily 2021 operational net emissions and Table 7 reports 2021 annual net emissions. As shown in Tables 6 and 7, average daily and annual 2021 maximum net emissions of NO_X would exceed BAAQMD thresholds. 2021 net operational NO_X emissions from stationary equipment (natural gas combustion) alone are predicted to be 10.45 tons per year or 65 pounds per average day under the maximum firing potential of the equipment, which would exceed the BAAQMD significance threshold and would be considered potentially significant. However, as shown in Tables 4 – 7, operational emissions of ROG, NO_X, PM_{10} exhaust, or $PM_{2.5}$ exhaust associated with operation would not exceed the BAAQMD significance thresholds. Assuming the maximum firing rate of stationary equipment, emissions of NO_X would be considered significant unless mitigation measure AQ-2 is implemented.

[7] SJVAPCD, 2014. *Notice of Issuance of Authorities to Construct Project Number: N-1141499*. June 2, 2014.

Table 4. Daily Air Pollutant Emissions from Operation of the 2017 Project (pounds/day)

Scenario	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project 2017[1]	7.1	11.5	5.4	1.5
Stationary Equipment (max.)	4.8	45.2	12.1	8.0
Stationary Equipment (expected)	1.7	16.0	7.8	3.7
Existing	1.6	3.0	1.0	0.3
Net Emissions (max.)	10.3	53.7	16.5	9.2
Daily Emission Thresholds	54	54	82	54
Exceed Threshold?	No	No	No	No
Net Emissions (expected)	7.2	24.5	12.2	4.9
Daily Emission Thresholds	54	54	82	54
Exceed Threshold?	No	No	No	No

Note: [1]Includes mobile, area, applicant-estimated electricity, applicant-estimated water usage, waste, and Title 24 natural gas. Based on 260 days per year.

Table 5. Annual Air Pollutant Emissions from Operation of the 2017 Project (tons/year)

Scenario	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project 2017[1]	0.92	1.49	0.70	0.20
Stationary Equipment (max.)	0.62	5.87	1.57	1.04
Stationary Equipment (expected)	0.22	2.08	1.02	0.48
Existing	0.29	0.54	0.19	0.06
Net Emissions (max.)	1.25	6.82	2.08	1.18
Annual Emission Thresholds	10	10	15	10
Exceed Threshold?	No	No	No	No
Net Emissions (expected)	0.85	3.03	1.53	0.62
Annual Emission Thresholds	10	10	15	10
Exceed Threshold?	No	No	No	No

Note: [1]Includes mobile, area, applicant-estimated electricity, applicant-estimated water usage, waste, and Title 24 natural gas.

Table 6. Daily Air Pollutant Emissions from Operation of the 2021 Project (pounds/day)

Scenario	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project 2021[1]	5.3	7.8	5.3	1.5
Stationary Equipment (max.)	6.4	60.2	14.7	10.2
Stationary Equipment (expected)	2.3	21.5	9.0	4.6
Existing	1.6	3.0	1.0	0.3
Net Emissions (max.)	10.1	65.0	19.0	11.4
Daily Emission Thresholds	54	54	82	54
Exceed Threshold?	No	***Yes***	No	No
Net Emissions (expected)	6.0	26.3	13.3	5.8
Daily Emission Thresholds	54	54	82	54
Exceed Threshold?	No	No	No	No

Note: [1]Includes mobile, area, applicant-estimated electricity, applicant-estimated water usage, waste, and Title 24 natural gas.

Table 7. Annual Air Pollutant Emissions from Operation of the 2021 Project (tons/year)

Scenario	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project 2021[1]	0.96	1.42	0.97	0.28
Stationary Equipment (max.)	1.16	10.99	2.68	1.87
Stationary Equipment (expected)	0.42	3.92	1.64	0.84
Existing	0.29	0.54	0.19	0.06
Net Emissions (max.)	1.83	11.87	3.46	2.09
Annual Emission Thresholds	10	10	15	10
Exceed Threshold?	No	*Yes*	No	No
Net Emissions (expected)	1.09	4.80	2.42	1.06
Annual Emission Thresholds	10	10	15	10
Exceed Threshold?	No	No	No	No

Note: [1]Includes mobile, area, applicant-estimated electricity, applicant-estimated water usage, waste, and Title 24 natural gas.

Mitigation Measure AQ-2: Limit project natural gas usage.

The project applicant shall develop a plan to monitor and record natural gas usage to compare with the anticipated usage projections supplied for this assessment. It is estimated that the project could use 3.57 million therms of natural gas consumption per year to remain at or below the NO_X significance threshold, compared with the full build-out projection of about 1.54 million therms. However, as discussed under Impact 6, the project shall use no more than 1.88 million therms of natural gas consumption per year to remain at or below the GHG significance threshold for stationary sources. Therefore, 1.88 million therms of natural gas consumption shall be the limit for future facility operations to remain below all BAAQMD significance thresholds.

Impact 3: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? ***Less than significant***

As discussed under Impact 2, the project would have emissions that would be below significance thresholds adopted by BAAQMD for evaluating impacts to ozone and particulate matter. Therefore, the project would not contribute substantially to existing or projected violations of those standards. Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and Federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. There was an ambient air quality monitoring station in Fremont that measured carbon monoxide concentrations. Though the monitoring station is now closed, the highest measured level over any 8-hour averaging period during the 3 year period from 2008 to 2010 was less than 2.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. The roadways affected by the proposed project have relatively low traffic volumes compared to the busier intersections in the Bay Area. BAAQMD screening guidance indicates that projects would have a less than significant impact to carbon monoxide levels if project traffic projections indicate traffic levels would not increase at any affected intersection to more than 44,000 vehicles per hour. The intersections affected by the proposed project have much lower traffic volumes (less than 10,000 vehicles per hour). Therefore, the change in traffic caused by the proposed project would be minimal and the project would not cause or contribute to a violation of an ambient air quality standard.

Impact 4: Expose sensitive receptors to substantial pollutant concentrations? ***Less-than- significant with construction-period mitigation***

Project impacts related to increased health risk can occur either by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs or by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. The BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs. In this case, the project would be a new source of TAC emissions. Impacts would occur during both construction and operation.

<u>Construction Impacts</u>

During excavation, grading and some building construction activities, substantial amounts of dust could be generated. Most of the dust would result during grading activities. The amount of dust generated would be highly variable and would be dependent on the size of the area disturbed at any given time, amount of activity, soil conditions and meteorological conditions. To address fugitive dust emissions that lead to elevated PM_{10} and $PM_{2.5}$ levels near construction sites the BAAQMD CEQA Air Quality Guidelines identify best control measures. Implementation of Mitigation Measure AQ-1 would reduce these impacts to a level of less than significant.

In addition, construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a TAC. A health risk assessment of the project construction activities was conducted that evaluated construction emissions of DPM and associated health risks to nearby residential areas. A dispersion model was used to predict the off-site concentrations resulting from project construction so that lifetime cancer risks could be predicted.

The CalEEMod model was used to calculate annual emissions from construction, as discussed under *Impact 2*. CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker and vendor traffic.

The CalEEMod model provided total annual $PM_{2.5}$ exhaust emissions (assumed to be diesel particulate matter) for the off-road construction equipment and for exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles), with total emissions of 0.30 tons (600 pounds) for the entire construction period. The on-road emissions are a result of haul trucks, vendor deliveries, and worker travel and during the various phases of construction. A trip length of 0.3 miles was used to represent vehicle travel while at or near the construction site. In modeling the on-road emissions it was assumed that these emissions from vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.0886 tons (177 pounds) for the overall construction period. The project emission calculations are provided in *Attachment 1*.

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at existing sensitive receptors (residences) in the vicinity of the project construction area. The ISCST3 dispersion model is one of several BAAQMD-recommended models for use in modeling analysis of these types of emission activities for CEQA projects.[8] Emission sources for the construction site were grouped into two categories, exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions. The ISCST3 modeling utilized two area sources to represent the on-site construction emissions, one for DPM exhaust emissions and the other for fugitive $PM_{2.5}$ dust emissions. For the exhaust emissions from construction equipment an emission release height of six meters was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases.[9] For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of two meters was used for the area source. Emissions from vehicle travel in and around the project site were included in the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. and 4 p.m.

The modeling used a one year data set of hourly meteorological data from 1999 for the HP Newark monitoring station prepared by BAAQMD. This station was previously located about 1.2 miles southeast of the project site. Annual DPM and $PM_{2.5}$ concentrations from construction activities in 2015 and 2016 were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors at a receptor height of 1.5 meters (4.9 feet) and 4.5 meters (14.8 feet) were used to represent the breathing heights of residents of single family homes and second level residents in apartments, respectively. Figure 1 shows the construction area modeled and locations of nearby sensitive receptors.

The maximum modeled DPM and $PM_{2.5}$ concentrations from construction occurred at a residence north of the project site on Central Avenue just south of the intersection of Central Avenue and Cherry Street. The location of this receptor is identified on Figure 1. Increased cancer risks were calculated using the modeled concentrations and BAAQMD recommended risk assessment methods for both a child exposure (3rd trimester through 2 years of age) and adult exposure.[10] The cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the DPM exposures. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. BAAQMD recommended

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[8] Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0*. May.

[9] Califronia Air Resources Board (CARB), 2007. *Technical Support Document: Proposed Regulation for In-use Off-Road Diesel Vehicles, Appendix D Health Risk Assessment Methodology*. April 2007.

[10] Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards*, May.

exposure parameters were used for the cancer risk calculations.[11] Infant and child exposures were assumed to occur at all residences during the entire construction period.

Results of this assessment indicate that for project construction the incremental residential child cancer risk at the maximally exposed individual (MEI) receptor would be 8.5 in one million and the incremental residential adult cancer risk would be 0.4 in one million. These increased cancer risks would be lower than the BAAQMD significance threshold of a cancer risk of 10 in one million or greater and would be considered a *less than significant impact.*

The maximum modeled annual $PM_{2.5}$ concentration was 0.12 $\mu g/m^3$ occurring at the same location as the maximum cancer risk. This $PM_{2.5}$ concentration is lower than the BAAQMD significance threshold of 0.3 $\mu g/m^3$ used to judge the significance of health impacts from $PM_{2.5}$. This would be considered a *less than significant* impact.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. Non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). California's Office of Environmental Health and Hazards (OEHHA) has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The chronic inhalation REL for DPM is 5 $\mu g/m^3$. The maximum modeled annual residential DPM concentration was 0.087 $\mu g/m^3$, which is much lower than the REL. The maximum computed hazard index based on this DPM concentration is 0.02 which is much lower than the BAAQMD significance criterion of a hazard index greater than 1.0. This would be considered a *less than significant* impact

Attachment 4 includes the construction emission calculations used for the ISCST3 area source modeling and the construction cancer risk calculations.

Based on the above results, the project would be below significance thresholds for construction community risk. However, best management practices are necessary during construction trenching and grading activities to avoid generation of fugitive dust that may affect nearby sensitive receptors. Best management practices for controlling construction-period air pollutant emissions are identified as Mitigation Measure AQ-1.

<u>Operational Delivery Trucks</u>

Emissions for project-related trucks were calculated assuming that there would be 41,610 trucks trips annually at full project build-out. 40,880 of these trips would be from large delivery vans and 730 daily trips would be from a large truck (semi-tractor/trailer). Delivery vans were modeled as medium-duty diesel trucks (MDT) and the large trucks were modeled as heavy-duty diesel trucks (HDT). This was done to provide a worst-case scenario in terms of modeling operational TAC risk.

[11] Bay Area Air Quality Management District (BAAQMD), 2010, *Air Toxics NSR Program Health Risk Screening Analysis Guidelines*, January.

However, acknowledging that not all Mission vehicles will be diesel-powered, actual operational risk from delivery trucks would be expected to be less than predicted. Emissions of DPM and $PM_{2.5}$ from these trucks were calculated using emission factors from EMFAC2011 for 2017 operation. Emissions were calculated for trucks traveling Central Avenue and Cherry Street within about 1,000 feet of the project facility. As previously discussed, use of vehicle emissions for 2017 provides a conservative estimate of emissions from project vehicles since emission factors for trucks are anticipated to be less in future years. The distribution of truck travel on these roads was based on information provided in the traffic report for this project. Details of the delivery truck DPM emissions are provided in *Attachment 4*.

Dispersion modeling was conducted with the ISCST3 model using one year of meteorological data (1999) from the HP Newark monitoring site available from the BAAQMD. This modeling used line sources (made up of a series of volume sources along the travel route) to represent the truck emissions from nearby roads. Figure 1 shows the truck routes used in the modeling. DPM concentrations were calculated at receptors along the travel routes at a height of 1.5 meters.

The maximum annual DPM concentration was 0.0009 ug/m^3. The cancer risk was calculated using the maximum modeled DPM concentration and applying the BAAQMD's 70 year average age sensitivity factor of 1.7. The maximum cancer risk occurred at a the same residential location where the maximum cancer risk from construction occurred, a residence on Central Avenue just south of the intersection of Central Avenue and Cherry Street. Figure 1 shows the location of the receptor with the maximum impact. For operational risks from project related trucks, the increased cancer risk would be 0.49 in one million for a 70-year exposure period, which is below the BAAQMD significance threshold. This is based on project operation in 2017 and assuming that emissions at the 2017 levels would occur for the entire 70-year exposure period even though the EMFAC2011 model predicts that emission rates of DPM from trucks will decrease in the future. The maximum modeled $PM_{2.5}$ concentration was 0.002 μg/m^3 which is well below the BAAQMD significance threshold. The project would have a *less-than-significant impact* with respect to community risk caused by operational delivery activities.

<u>Operational Stationary Sources</u>

Stationary TAC sources for the project would include the natural gas-fired boilers, dryers and garment finishing tunnel. TACs are generated during the combustion of natural gas. As recommended in the BAAQMD Permitting Handbook, TAC emissions from natural gas combustion should include emissions of benzene, formaldehyde, and toluene.[12] Benzene and formaldehyde are carcinogenic TAC compounds, in addition to also causing acute and chronic non-cancer health effects. Toluene only causes non-cancer health effects.

Potential health risks to nearby residents from project natural gas combustion sources were evaluated for maximum operating conditions at full build-out (2021) conditions. Emissions of benzene, formaldehyde, and toluene were calculated for each emission source using BAAQMD-recommended

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[12] BAAQMD, 2014. *BAAQMD Permit Handbook*, Section 2.1 Boilers, Steam Generators & Process Heaters. July 9, 2014.

emission factors (BAAQMD Permit Handbook) and combustion equipment maximum heat input rates. Details of the stationary source TAC emission calculations are shown in *Attachment 4*.

Modeling of TACs from the project's combustion sources was conducted with the ISCST3 model using one year of meteorological data (1999) from the HP Newark monitoring site available from the BAAQMD. All of the boilers, dryers, and garment finishing tunnel will discharge their combustion exhaust through individual stacks terminating about two feet above the roof level of the facility building and were modeled as stack type sources. Information on building dimensions, stack heights and stack exhaust information were provided by the applicant and are included in *Attachment 4*.

Hourly and annual average benzene, formaldehyde, and toluene concentrations were calculated at the nearby residential receptor locations, as described above for the delivery truck DPM modeling. Based on the maximum annual average concentrations for benzene and formaldehyde, cancer risks were calculated using BAAQMD recommended methods which include applying a 70 year average age sensitivity factor of 1.7. The maximum increased cancer risk from benzene and formaldehyde emissions would be 0.022 in one million. When combined with the maximum cancer risk from delivery truck DPM emissions the total increased project cancer risk would be 0.51 in one million. This total increased cancer risk is well below the BAAQMD significance threshold for increased cancer risk of 10 in one million and would be considered a *less-than-significant impact*.

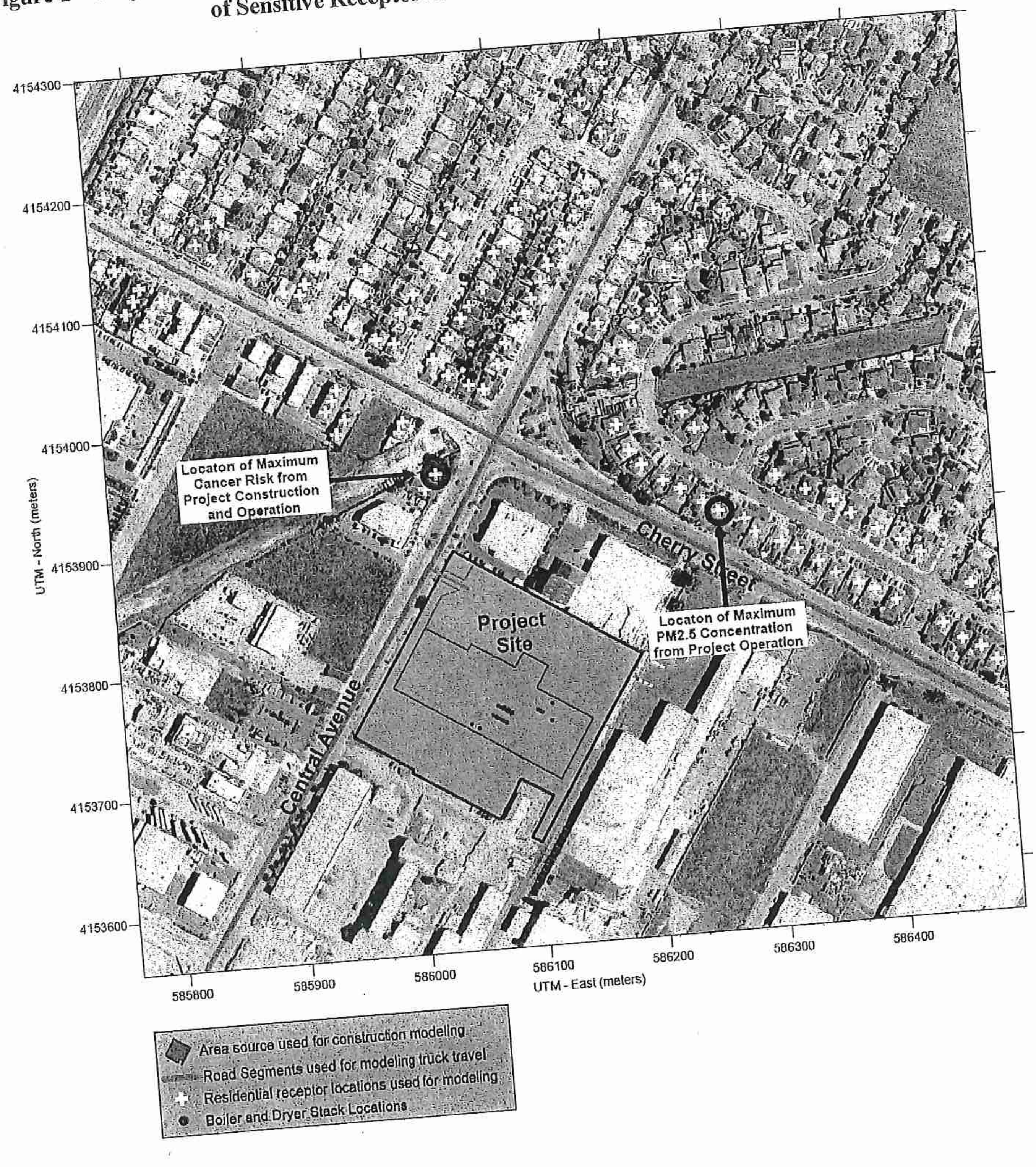
Potential acute and chronic non-cancer health effects were evaluated using the BAAQMD recommended hazard index approach. In this case the individual HI values for each TAC (DPM, benzene, formaldehyde, and toluene) were calculated based the maximum modeled TAC concentration and TAC specific REL. Acute HIs were calculated using maximum 1-hour TAC concentrations and RELs for acute effects and the chronic HIs were calculated using the maximum annual average TAC concentrations and RELs for chronic effects. The sum of the individual chronic and acute HIs were then calculated to get a total chronic HI and total acute HI.

The total chronic HI from all project operational TAC emissions would be 0.0004 and the total acute HI would be 0.002. These HIs are well below the BAAQMD significance threshold of a HI of 1.0 or greater. Thus, non-cancer health impacts from project operation would be considered a *less-than-significant impact*.

The maximum modeled annual $PM_{2.5}$ concentration from the project's stationary sources was 0.22 $\mu g/m^3$, occurring at a residence on the north side of Cherry Street, north of the project site (see Figure 1). The maximum $PM_{2.5}$ concentration is below the BAAQMD significance threshold would be considered a *less-than-significant impact*.

Details of the operational cancer and non-cancer health risk calculations are provided in *Attachment 4*.

Figure 1 – Project Site, Construction and Operation Emission Sources Modeled, and Locations of Sensitive Receptors and Maximum Cancer Risk



Impact 5: Create objectionable odors affecting a substantial number of people? ***Less than Significant***

Construction activities may cause localized odors that would be temporary and are not anticipated to result in frequent odor complaints.

Examples of odor-generating land uses include wastewater treatment plants, solid waste landfills and transfer stations, composting facilities, oil refineries, asphalt batch plants, chemical manufacturing plants, and coffee roasters, among others. Industrial linen facilities are not identified by BAAQMD as land use types that cause odor complaints. Therefore, operation of the proposed project is not expected to generate odors that would result in confirmed odor complaints.

Impact 6: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less than Significant with Mitigation***

The BAAQMD May 2011 CEQA Guidelines included GHG emissions-based significance thresholds. These thresholds include a "bright-line" emissions level of 1,100 metric tons per year for land-use type projects and 10,000 metric tons per year for stationary sources. Projects with emissions above the thresholds would be considered to have an impact, which, cumulatively, would be significant. The proposed project would include several stationary sources, such as boilers, dryers and garment finishing tunnels.

<u>CalEEMod Modeling</u>

CalEEMod was also used to predict GHG emissions from operation of the site (see description under *Impact 2*). Operational emissions from the project would be generated primarily from autos driven by future employees and from delivery and service trucks. Emissions would also be generated by stationary equipment, such as boilers and dryers. CalEEMod was used to predict emissions from operation of the site for both the first full opening year (2017) and full build out of the project (2021). Unless otherwise noted below, the CalEEMod model defaults to predict GHG emissions for Alameda County were used. CalEEMod provides emissions for transportation, areas sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. Adjustments to the model are described below. Model output worksheets are included in *Attachment 1*.

Land Use Descriptions

The proposed land use and size was input to CalEEMod as 109,046 s.f. of "General Light Industrial." The existing Union City site was entered as 31,500 s.f. of "General Light Industrial."

Trip Generation Rates and Types

CalEEMod allows the user to enter specific trip generation rates. Omni Means provided the trip generation rate for the project and the existing Union City site, which were entered into the model. Model default trip types and distances were used.

Model Year
The model uses mobile emission factors from the California Air Resources Board's EMFAC2011 model. This model is sensitive to the year selected, since vehicle emissions have and continue to be reduced due to fuel efficiency standards and low carbon fuels. The year 2017 was analyzed as the first full year that the project could conceivably be occupied. A year 2021 full build-out model run was also conducted.

Energy and Water Use

The project applicant provided anticipated electricity and water consumption values that were input to the model. CalEEMod was used to calculate only emissions associated with Title 24 natural gas consumption. Natural gas consumption associated with proposed stationary equipment (i.e., boilers, dryers, and finishing tunnels) was calculated separate from the model, as described below. Separate significance thresholds for GHGs exist for direct emissions from stationary equipment (i.e., natural gas combustion), which is why emissions were calculated in this manner. See *Attachment 2* for project-specific data. The 2013 Title 24 Building Standards recently became effective July 1, 2014 and are predicted to use 25 percent less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 standards that CalEEMod is based on.[13] Therefore, the CalEEMod runs were adjusted to account for the greater energy efficiency. By the nature of the model, these reductions must be included in the "mitigated" output. CalEEMod defaults for energy and water use were used for the Existing model run.

Emissions rates associated with electricity consumption were adjusted to account for Pacific Gas & Electric utility's (PG&E) projected 2017 and 2021 CO_2 intensity rate. The rates are based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. CalEEMod uses a default rate of 641.35 pounds of CO_2 per megawatt of electricity produced. The derived 2017 rate for PG&E was estimated at 348.86 pounds of CO_2 per megawatt of electricity delivered and is based on the California Public Utilities Commission (CPUC) GHG Calculator.[14] The derived 2021 rate for PG&E was estimated at 289.84 pounds of CO_2 per megawatt of electricity delivered and is based on the published 2020 rate since this is the latest year available in the Calculator.

Other Inputs

Default model assumptions for GHG emissions associated with area sources and solid waste

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[13] California Energy Commission, 2012. *2013 Building Energy Efficiency Standards FAQ*. May.
[14] California Public Utilities Comissions GHG Calculator version 3c, October 7, 2010. Available on-line at: http://ethree.com/public_projects/cpuc2.php. Accessed: November 10, 2014.

Mission Linnen, Newark, CA - Truck Travel PM2.5 Emissions - 2017

Truck Route	Percent Trucks on Road	Vehicle Type[1]	Daily Trucks Trips[2]	Total Annual Trips[3]	Operation Hours per Day[4]	Travel Speed (mph)	PM2.5 Emission Factor[4] (g/mi)	Travel Distance (feet)	Travel Distance (miles)	PM2.5 Emissions Total Annual[5] (lb/year)	PM2.5 Emissions Average Hourly (lb/hr)
Total Truck Trips	100%	HDT	2	730	3	-	-	-	-	-	-
		MDT	112	40,880	12	-	-	-	-	-	-
Off-Site Truck Travel											
Central Ave - North	19%	HDT	0.4	139	3	25	0.0940	1061	0.20	0.01	5.28E-06
		MDT	21.3	7,767	12	25	0.1254	1061	0.20	0.43	9.86E-05
			21.7	7,906						0.44	1.04E-04
Central Ave - South	25%	HDT	0.5	183	3	30	0.0918	1253	0.24	0.01	8.00E-06
		MDT	28.0	10,220	12	30	0.1211	1253	0.24	0.65	1.48E-04
			28.5	10,403						0.66	1.56E-04
Central & Cherry to Site Entrance	75%	HDT	1.5	548	3	20	0.0956	392	0.07	0.01	7.82E-06
		MDT	84.0	30,660	12	20	0.1329	392	0.07	0.67	1.52E-04
			85.5	31,208						0.68	1.60E-04
Cherry St - East	19%	HDT	0.4	139	3	35	0.0921	1585	0.30	0.01	7.72E-06
		MDT	21.3	7,767	12	35	0.1197	1585	0.30	0.62	1.40E-04
			21.7	7,906						0.62	1.48E-04
Cherry St - West	37%	HDT	0.7	270	3	25	0.0940	1246	0.24	0.01	1.21E-05
		MDT	41.4	15,126	12	25	0.1254	1246	0.24	0.99	2.25E-04
			42.2	15,396						1.00	2.37E-04
Total										*2.72*	*6.45E-04*

[1] HDT = heavy duty truck, MDT = medium duty truck

[2] Assumes that 56 large delivery vans are MDT and 1 semi-tractor/trailer is HDT, with 2 trips per vehicle per day.

[3] Annual trucks - Based on 365 days of operation

[4] Delivery trucks (MDT) woudl operate from around 5 am to 5 pm and semi-truck (HDT) would operate from about 9 pm to 12 am.

[5] Emission factors from EMFAC2011 for Alameda Co. for operation in 2017 and assumes all trucks are diesel. PM2.5 emission factors include tire and brake wear

Mission Linen, Newark, CA - Operational Truck Impacts
Maximum DPM Cancer Risk and Annual PM2.5 Impacts From Delivery Trucks

DPM Emission Rates

Source Type(s)	Annual DPM (lb/yr)
Off-site Delivery Trucks	1.42

Modeling Information

Model:	ISCST3
Source	Off-site Delivery Trucks
Source Type	10 Line-Volume Sources
Meteorological Data	Newark - HP 1999 Data (from BAAQMD)
Line-Volume Source Parameters	
Line Source Lengths	variable (refer to emissions table)
Volume Plume Height	6.8 meters
Volume Plume Width	24 ft
Volume Release Height	11.2 ft (3.4 m)
Hourly Emission Rate (lb/hr)	variable (refer to emissions table)
Receptors	
Number of Receptors	147
Receptor Spacing	(refer to emissions table)
Receptor Height	1.5 m (4.9 ft)

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x HD x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (μg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
HD = daily exposure (hours/day/24)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

Exposure Type	Value[1] DBR (L/kg BW-day)	A (-)	Exposure (hr/day)	Exposure (days/week)	Exposure (week/year)	EF (days/yr)	ED (Years)	AT (days)
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor (mg/kg-day)$^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per μg/m^3)

Unit Risk Factor f or DPM

Exposure Type	CPF (mg/kg-day)$^{-1}$	CRAF (-)	URF *DPM*
Residential (70-Yr Exposure)	1.10E+00	1.7	541.5

Model Results and Cancer Risks

Exposure Type	Maximum DPM Annual Ave (μg/m^3)	Maximum DPM Cancer Risk (per million)	Maximum PM2.5[a] Annual Ave (μg/m^3)
Residential (70-Yr Exposure)	0.00091	0.49	0.002

Stationary Source PM2.5 and TAC Emissions and Health Impacts

Mission Linen Supply - Newark
Summary of PM2.5 Emission Rates and Stack Parameter Information for Modeling

Maximum PM2.5 Emission Rates

Equipment	No. of Units	Maximum Heat Input (Btu/hr)	Maximum Heat Input (MMBtu/hr)	2017 PM2.5 Emissions per Unit (lb/hour)	g/s	2021 PM2.5 Emissions per Unit (lb/hour)	g/s	Stack Height Above Ground level (ft)	Stack Diameter (in)	Exhaust Gas Temp. (F)	Exhaust Gas Flow Rate (acfm)
Hurst Series 500 Boiler	2	19,950,000	19.95	0.1059	0.01334	0.1486	0.01873	38	24	150	4,180
Milnor Model 6458 Gas Dryer	16	1,800,000	1.8	0.0142	0.00179	0.0186	0.00235	38	26	170	8,844
Brim 74/78G Gas Dryer	1	2,500,000	2.5	0.0201	0.00253	0.0263	0.00332	38	30	170	8,000
Pony Gas Dryer	5	375,000	0.35	0.0020	0.00025	0.0028	0.000355	38	14	170	2,150
Colmac CTU240 Garment Finishing Tunnel	1	800,000	0.8	0.0042	0.00054	0.0060	0.00075	38	16	250	2,476

2017 Daily Operation Hours = 12 5am - 5 pm
2021 Daily Operation Hours = 16 5am - 9 pm

Expected PM2.5 Emission Rates

Equipment	No. of Units	Maximum Heat Input (Btu/hr)	Maximum Heat Input (MMBtu/hr)	2017 PM2.5 Emissions per Unit (lb/hour)	g/s	2021 PM2.5 Emissions per Unit (lb/hour)	g/s	Stack Height Above Ground level (ft)	Stack Diameter (in)	Exhaust Gas Temp. (F)	Exhaust Gas Flow Rate (acfm)
Hurst Series 500 Boiler	2	19,950,000	19.95	0.0375	0.004723	0.0530	0.00668	38	24	150	4,180
Milnor Model 6458 Gas Dryer	16	1,800,000	1.8	0.0080	0.0010	0.0100	0.00126	38	26	170	8,844
Brim 74/78G Gas Dryer	1	2,500,000	2.5	0.0115	0.0015	0.0143	0.00181	38	30	170	8,000
Pony Gas Dryer	5	375,000	0.35	0.0007	0.000091	0.0010	0.000128	38	14	170	2,150
Colmac CTU240 Garment Finishing Tunnel	1	800,000	0.8	0.0015	0.00019	0.0021	0.00027	38	16	250	2,476

2017 Daily Operation Hours = 12 5am - 5 pm
2021 Daily Operation Hours = 16 5am - 9 pm

Mission Linen Supply - Newark
Summary of Stack Parameter Information for Modeling
2021 TAC Emissions

Maximum TAC Emission Rates

Equipment	No. of Units	2021 Average Hourly TAC Emissions (per unit)						Stack Parameters			
		Benzene (lb/hour)	Formaldehyde (lb/hour)	Toluene (lb/hour)	Benzene g/s	Formaldehyde g/s	Toluene g/s	Stack Height Above Ground level (ft)	Stack Diameter (in)	Exhaust Gas Temp. (F)	Exhaust Gas Flow Rate (acfm)
Hurst Series 500 Boiler	2	4.11E-05	1.47E-03	6.65E-05	5.18E-06	1.85E-04	8.38E-06	38	24	150	4,180
Milnor Model 6458 Gas Dryer	16	3.71E-06	1.32E-04	6.00E-06	4.67E-07	1.67E-05	7.56E-07	38	26	170	8,844
Brim 74/78G Gas Dryer	1	5.15E-06	1.84E-04	8.33E-06	6.49E-07	2.32E-05	1.05E-06	38	30	170	8,000
Pony Gas Dryer	5	7.72E-07	2.76E-05	1.25E-06	9.73E-08	3.47E-06	1.58E-07	38	14	170	2,150
Colmac CTU240 Garment Finishing Tunnel	1	1.65E-06	5.88E-05	2.67E-06	2.08E-07	7.41E-06	3.36E-07	38	16	250	2,476

Emission factors from BAAQMD: Based on September 7, 2005 Memorandum from Brian Bateman (Subj: Emission Factors for Toxic Air Contamintants

2021 Daily Operation Hours = 16 5am - 9 pm

Mission Linen Supply, Newark, CA
Toxic Air Contaminant Emissions: Combustion Equipment - Maximum & Expected Equipment Operation
2021 Operation

Expected Annual Natural Gas Use and Process Rates	
Total Gas Use (therms) =	1,539,322
Total Gas Use MMBtu) =	153,932
Material Processed (clean dry lbs) =	71,375,060

Operation Schedule			
(hr/day)	(day/week)	(hr/year)	day/year
16	7	5,840	365

Equipment	No. of Equip	Maximum Heat Input per Unit (MMBtu/hr)	Fracion of Total Maximum Heat Input	Total Heat Input - Maximum Firing Rate[1] (MMBtu/hr)	Total Heat Input - Maximum Firing Rate[1] (MMBtu/year)	Total Heat Input - Maximum Firing Rate[1] (therms/year)	Total Heat Input - Expected Gas Use[2] (MMBtu/hr)	Total Heat Input - Expected Gas Use[2] (MMBtu/year)	Total Heat Input - Expected Gas Use[2] (therms/year)	Emission Factors[3] (lb/MMCF) Benzene	Emission Factors[3] (lb/MMCF) Formaldehyde	Emission Factors[3] (lb/MMCF) Toluene
Hurst Series 500 boiler with sub 9 ppm ultra low NOx burner	2	19.95	0.540	39.9	233,016	2,330,160	14.2	83,139	831,390	0.0021	0.075	0.0034
Milnor Model 6458 Gas Dryer	16	1.8	0.390	28.8	168,192	1,681,920	10.3	60,010	600,101	0.0021	0.075	0.0034
Brim 74/78G Gas Dryer	1	2.5	0.034	2.5	14,600	146,000	0.9	5,209	52,092	0.0021	0.075	0.0034
ADC/Pony Gas Dryer - 125 lb capacity	5	0.375	0.025	1.9	10,950	109,500	0.7	3,907	39,069	0.0021	0.075	0.0034
Colmax CTU240 Garment Finishing Tunnel	1	0.800	0.011	0.8	4,672	46,720	0.3	1,667	16,669	0.0021	0.075	0.0034
Total		25.425	1.00	73.9	431,430	4,314,300	26.4	153,932	1,539,322			

Equipment	Maximum Emission Rates[4] Hourly (lb/hr) Benzene	Maximum Hourly (lb/hr) Formaldehyde	Maximum Hourly (lb/hr) Toluene	Maximum Annual (lbs/year) Benzene	Maximum Annual (lbs/year) Formaldehyde	Maximum Annual (lbs/year) Toluene	Expected Emission Rates[5] Hourly (lb/hr) Benzene	Expected Hourly (lb/hr) Formaldehyde	Expected Hourly (lb/hr) Toluene	Expected Annual (lbs/year) Benzene	Expected Annual (lbs/year) Formaldehyde	Expected Annual (lbs/year) Toluene
Hurst Series 500 boiler with sub 9 ppm ultra low NOx burner	8.21E-05	2.93E-03	1.33E-04	4.80E-01	1.71E+01	7.77E-01	2.93E-05	1.05E-03	4.75E-05	1.71E-01	6.11E+00	2.77E-01
Milnor Model 6458 Gas Dryer	5.93E-05	2.12E-03	9.60E-05	3.46E-01	1.24E+01	5.61E-01	2.12E-05	7.56E-04	3.43E-05	1.24E-01	4.41E+00	2.00E-01
Brim 74/78G Gas Dryer	5.15E-06	1.84E-04	8.33E-06	3.01E-02	1.07E+00	4.87E-02	1.84E-06	6.56E-05	2.97E-06	1.07E-02	3.83E-01	1.74E-02
ADC/Pony Gas Dryer - 125 lb capacity	3.86E-06	1.38E-04	6.25E-06	2.25E-02	8.05E-01	3.65E-02	1.38E-06	4.92E-05	2.23E-06	8.04E-03	2.87E-01	1.30E-02
Colmax CTU240 Garment Finishing Tunnel	1.65E-06	5.88E-05	2.67E-06	9.62E-03	3.44E-01	1.56E-02	5.88E-07	2.10E-05	9.51E-07	3.43E-03	1.23E-01	5.56E-03
Total	1.52E-04	5.43E-03	2.46E-04	8.88E-01	3.17E+01	1.44E+00	5.43E-05	1.94E-03	8.79E-05	3.17E-01	1.13E+01	5.13E-01

[1] Calculated based on maximum equipment firing rates and fraction of total maximum heat input.
[2] Calculated based on projected actual facility total gas use and fraction of total maximum heat input.
[3] Emission factors from BAAQMD: Based on September 7, 2005 Memorandum from Brian Bateman (Subj: Emission Factors for Toxic Air Contaminants
[4] Maximum emission rates based on equipment maximum firing rates.
[5] Expected emission rates based on expected equipment gas use.

Natural Gas Values

Heating Value =	1,020	Btu/SCF
1 therm =	100,000	Btu

Mission Linen Supply, Newark, CA - Maximum Health Impacts from Operation
Cancer Risk, Hazard Index, and PM2.5 From Maximum Operation TAC Emissions

Modeling Information	
Model:	ISCST3
Sources	Traffic and Facility Combustion Sources
Source Type	Volume and point
Number of Sources	25 Point & 10 Line-Volume Sources
Receptor Height (m)	1.5 m
Meteorological Data	Newark - HP 1999 Data (from BAAQMD)

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x HD x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
HD = daily exposure (hours/day/24)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per million per $\mu g/m^3$)

Unit Risk Factor for 70-Year Residential Exposure

Exposure Type	**CPF $(mg/kg\text{-}day)^{-1}$**	**CRAF (-)**	**URF *(cancer risk/ug/m³)***
DPM	1.10E+00	1.7	541.5
Benzene	1.00E-01	1.7	49.2
Formaldehyde	2.10E-02	1.7	10.3

Model Results and Maximum Cancer Risks - Residential Receptor (70-Year Exposure)

	Maximum Concentrations				
TAC	**1-Hour (µg/m3)**	**Annual Ave (µg/m3)**	**Cancer Risk (per million)**	**Chronic Hazard Index**	**Acute Hazard Index**
DPM	-	0.00091	0.493	0.0002	-
Benzene	0.00314	0.00005	0.002	0.0000	0.0000
Formaldehyde	0.11226	0.00188	0.019	0.0002	0.0020
Toluene	0.00509	0.00009	-	0.0000	0.0000
PM2.5	-	0.22	-	-	-
Total			0.51	0.0004	0.0020

Reference Exposure Levels (REL)

	Reference Exposure Level ($\mu g/m^3$)	
Compound	**Acute (1-hour)**	**Chronic (annual average)**
DPM	-	5
Benzene	1,300	60
Formaldehyde	55	9
Toluene	37,000	300

Source: BAAQMDRegulation 2, Rule 5, Table 2-5-1 Toxic Air Contaminant Trigger levels

Attachment 2-Traffic Analysis (Omni Means)

Mission Linen Service Light-Industrial Project Traffic Impact Analysis

Prepared For:

The City of Newark

September 19, 2014
Final Report

Prepared By:

omni · means
ENGINEERS · PLANNERS

MISSION LINEN SERVICE LIGHT-INDUSTRIAL PROJECT
TRAFFIC IMPACT ANALYSIS

FINAL REPORT

PREPARED FOR:
THE CITY OF NEWARK

PREPARED BY:

OMNI-MEANS, LTD.
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SEPTEMBER 19, 2014

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Technical Appendices (Separate Document)

INTRODUCTION

This report presents the results of a traffic impact analysis performed by OMNI-MEANS for the proposed Mission Linen Facility project in the City of Newark. The proposed project would consist of a light-industrial building of 109,000 square feet to facilitate the processing of linens (primarily from health care facilities). The proposed project site is located immediately south of Central Avenue and west of Cherry Street on the southwest quadrant of the Cherry Street/Central Avenue intersection (see Figure 1-- Project Location and Vicinity Map). Based on discussions with City Engineering staff, the traffic issues for this development relate to operations at key intersections relating to freeway/truck route, project trip generation characteristics, as well as more localized operations regarding vehicle access to/from the site. Some of the key components of the analysis include the following:

- Weekday peak hour traffic operations at intersections in the project area along Cherry Street, Central Avenue, Mowry Avenue, and Thornton Avenue;
- *Highway Capacity Manual* (HCM) *2000* intersection Level-of-Service (LOS) methodologies;
- Proposed project trip generation relative to linen processing, employee shifts, and truck traffic;
- Cumulative Year 2035 traffic conditions;
- Consistency with recent transportation analyses conducted for the Newark General Plan Update Environmental Impact Report (EIR) and the adjacent Fremont projects in the study area.

Based on communication with City Planning staff, the following six scenarios have been analyzed as part of a comprehensive transportation and circulation analysis:

- Existing Traffic Conditions: Represents existing traffic flow conditions collected through new field counts. Points of congestion and vehicle delays are noted for both the AM and PM weekday commute peak hour;

- Existing Plus Project Conditions: Proposed project trips added to existing traffic volumes to determine project specific impacts;

- Near-Term Conditions: Represents existing traffic plus traffic from anticipated approved/pending projects over the next 2-3 year period. Approved/pending developments may not have begun construction, may be under construction but not occupied, or may be partially occupied;

- Near-Term Plus Project Conditions: Proposed project trips added to near-term traffic volumes to determine project-specific impacts;

- Cumulative Year 2035 (No Project) Conditions: Year 2035 conditions were derived by using recent transportation studies for the Newark General Plan Update Draft EIR;

- Cumulative Year 2035 Plus Project Conditions: Year 2035 conditions adjusted to include proposed project volumes.

STUDY CONDITIONS

Existing conditions describe the existing transportation and bicycle/pedestrian facilities serving the project site. For the purposes of this analysis, Interstate 880 is considered north-south facility in the project study area with local streets consistent with this orientation (i.e. Cherry Street extends in a north-south direction).

EXISTING ROADWAYS

A base map with existing study intersection locations, surrounding street network, and project site is shown in Figure 1. Streets that provide local and sub-regional access into and around the proposed project vicinity include Central Avenue, Cherry Street, Mowry Avenue, Thornton Avenue, and Cedar Boulevard. Regional access to the project site is provided by Interstate 880 and State Route 84. A brief description of each roadway follows:

Central Avenue extends in an east-west direction between Willow Street and I-880. Between Willow Street and Filbert Street, Central Avenue is a two-lane arterial street. Once east of Filbert Street, Central Avenue extends as a four-lane arterial street through I-880. Between Willow Street and Cherry Street, Central Avenue provides access mainly to commercial and light industrial areas. East of Cherry Street, the roadway provides access to both commercial and residential areas. Central Avenue would provide direct access to the proposed project site.

Cherry Street is another arterial street extending north-south between Stevenson Boulevard and Mirabeau Street. A four-lane roadway, Cherry Street has a two-way-left-turn lane between Mowry Avenue and Thornton Avenue and provides access to commercial, light-industrial, and residential areas. North of Thornton Avenue, Cherry Street narrows to two travel lanes and provides access to residential areas.

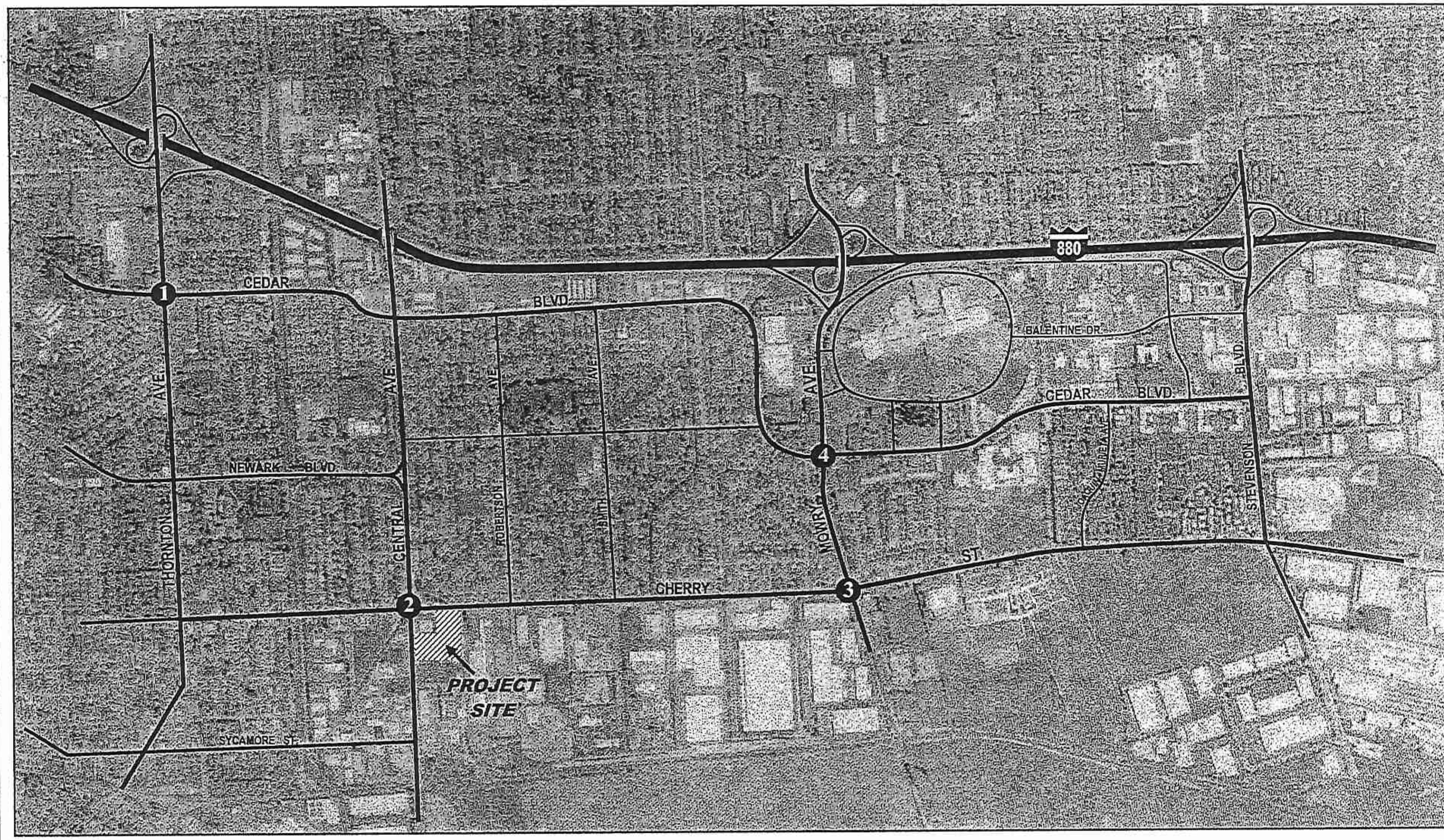
Mowry Avenue is located south of Central Avenue and extends in an east-west direction. The roadway has four travel lanes between Cherry Street and Cedar Boulevard. East of Cedar Boulevard, Mowry Avenue widens to six travel lanes as it crosses over I-880. Mowry Avenue provides access to recreational, residential, and commercial areas of the City and is a major arterial street.

Cedar Boulevard is a major north-south arterial street extending through most of Newark. Beginning at Haley Street, Cedar Boulevard extends east past Newark Boulevard before turning south past Thornton Avenue, Central Avenue, and Mowry Avenue before terminating at Stevenson Boulevard. A four-lane roadway, Cedar Boulevard serves commercial, light-industrial, and residential areas throughout Newark.

Thornton Avenue is an arterial street that aligns mostly east-west through the City of Newark between State Route 84 and Interstate 880 extending into the City of Fremont. From SR 84, Thornton Avenue extends south and east as a two or four lane arterial street to Willow Street. Between Willow Street and Sycamore Street, Thornton Avenue has two travel lanes and a two-way-left-turn-lane. East of Sycamore Street, Thornton Avenue widens to three travel lanes (1 westbound, 2 eastbound) to Cherry Street. Finally, the roadway extends east for four-travel lanes all the way through I-880 into the City of Fremont. Thornton Avenue provides access to residential, light industrial, and commercial areas in the western part of Newark. Thornton Avenue becomes Paseo Padre Parkway north of SR 84.

Regional access to the City of Newark is provided by State Route 84 and Interstate 880:

State Route 84 (SR 84) extends in an east-west direction along the northern limits of the City. A six-lane facility, SR 84 has five mixed-flow lanes and one high-occupancy vehicle (HOV) lane in the eastbound direction. Full-access interchanges are located at the Thornton Avenue/Paseo Padre Parkway and Newark



Project Vicinity Map

Reference North

omni-means

figure 1

Boulevard/Ardenwood Boulevard locations. SR 84 provides access east to Livermore (I-580) and west to San Gregorio and Highway 1. **Interstate 880** (I-880) extends north-south along the eastern border of the City and is an eight-lane facility with six mixed flow lanes and one HOV lane in each direction. Full access interchanges are located at the Thornton Avenue, Mowry Avenue, and Stevenson Boulevard locations. I-880 provides primary access north to Oakland and south to San Jose.

EXISTING INTERSECTIONS

The following list of study intersections have been reviewed by Newark Engineering staff for both existing and proposed project operating conditions. Intersection operation is usually considered a key factor in determining the traffic handling capacity of a local street circulation system. Based on discussions with City of Newark Engineering staff, four (4) key intersections (in addition to the main access driveways) were selected for evaluation of current operational characteristics on Thornton Avenue, Cedar Boulevard, Cherry Street, Central Avenue, and Mowry Boulevard as follows:[1]

1. Thornton Avenue/Cedar Boulevard — Signalized
2. Central Avenue/Cherry Street — Signalized
3. Mowry Avenue/Cherry Street — Signalized
4. Mowry Avenue/Cedar Boulevard — Signalized

Existing study intersections' AM and PM peak hour traffic volumes are shown on Figure 2.

INTERSECTION LEVEL-OF-SERVICE (LOS) CONCEPT/METHODOLOGIES

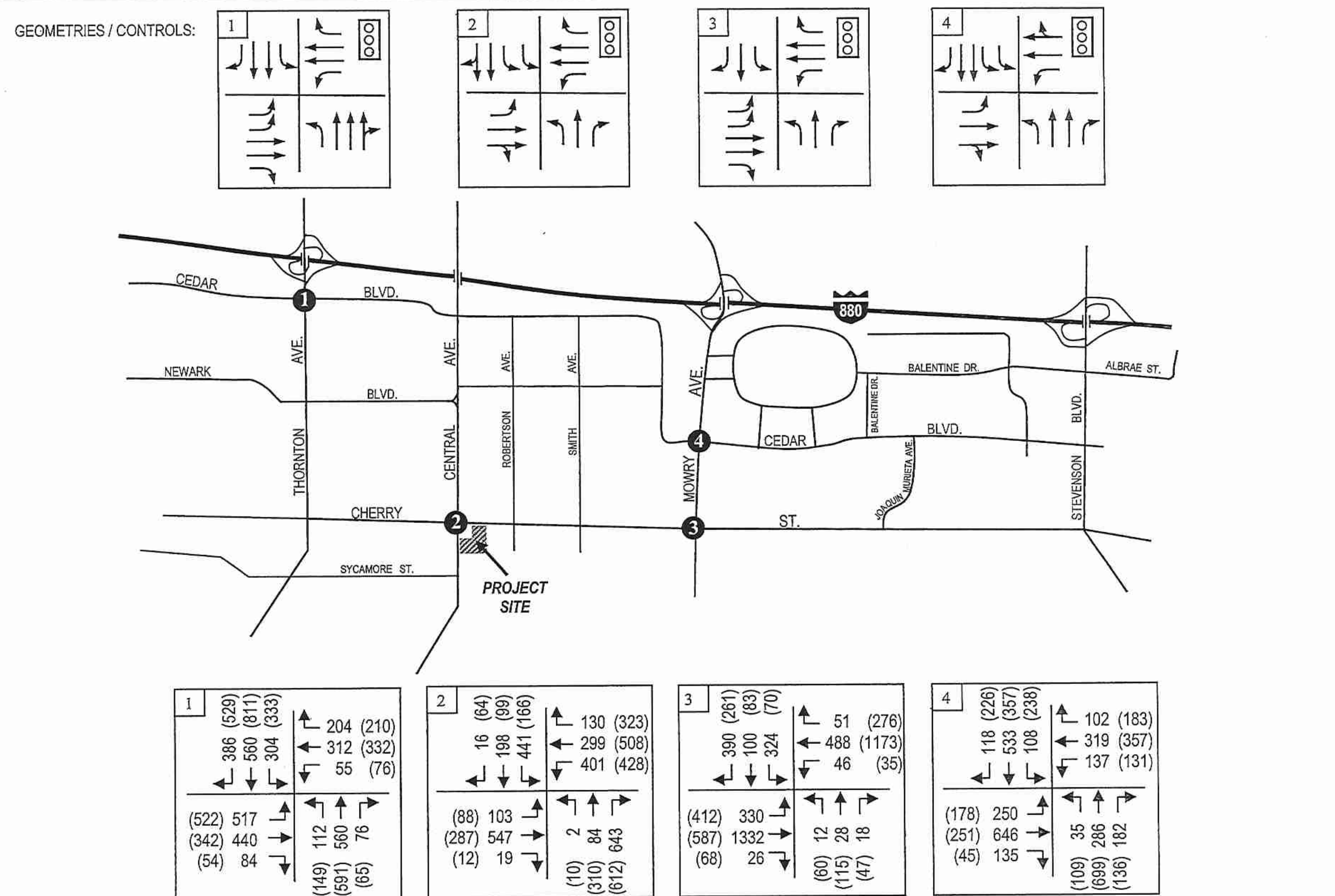
A method of measuring intersection operation is to apply a Level-of-Service (LOS) scale of operational performance. At a signalized intersection, LOS is determined by calculating the volume of conflicting turning movements at the intersection during a one-hour peak period. This total is then divided by the design capacity calculated to accommodate those turning movements. This calculation yields a volume/capacity ratio (v/c) ratio and vehicle delay in seconds. The resulting output corresponds to LOS ratings between "A" to "F" that describe increasing levels of traffic demand and increases in vehicle delay and deterioration of service (please refer to LOS Definitions, show in Table 1).

As an example, LOS A represents free-flow conditions with little or no delay. LOS E represents unstable flow conditions with volumes at or near design capacity. Motorists are likely to experience major delays (40 to 60 seconds) to clear an intersection. LOS F represents "jammed" conditions where traffic flows exceed the design capacity of the intersection.

At non-signalized intersections, LOS usually refers to the minor street movement controlled by a stop-sign. While overall intersection LOS from the major street may be C or better, a minor street turning movement may be functioning at LOS D or E. For all-way-stop-control intersections, intersection LOS refers to the average delay of all approaches. However, if one of the intersections' approach legs is substantially unbalanced (volume), that specific leg may experience proportionately longer delays.

Highway Capacity Manual 2000 (*HCM 2000*) operations methodology was used to calculate signalized and non-signalized intersection LOS and delay using Synchro/SimTraffic software. These "field level" intersection LOS calculations incorporate appropriate heavy vehicle adjustment factors, peak hour factors, and shared/non-shared lane factors. A standard peak hour factor (PHF) of 0.92 is typically applied to all non-signalized analysis scenarios in this study (PHF refers to traffic approach progression through the intersection) except where previously recommended mitigation applies.

1 Soren Fajeau, City Engineer, City of Newark, Project study intersections—personal communication, December, 2013.



Existing Weekday A.M. and (P.M.) Peak Hour Volumes

omni-means

figure 2

TABLE 1
LEVELS-OF-SERVICE (LOS) CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Control Delay (seconds/vehicle): Signalized	Unsignalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0 secs. ≤ 0.60 v/c	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0 secs. 0.61 – 0.70 v/c	>10 and ≤ 15.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20 and ≤ 35.0 secs. 0.71 – 0.80 v/c	>15 and ≤ 25.0	>15 and ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles of stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0 secs. 0.81 – 0.90 v/c	>25 and ≤ 35.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0 secs. 0.91 – 1.00 v/c	>35 and ≤ 50.0	>35 and ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0 secs. > 1.00 v/c	> 50.0	> 50.0

References: 1. Highway Capacity Manual, Fourth Edition, Transportation Research Board, 2000, Contra Costa Transportation Authority (CCTA), Technical Procedures Update, Final, July 9, 2006

Existing Intersection Operation

With the proposed project being light-industrial in nature, a portion of the project's trip generation would occur during the weekday AM and PM commute periods when office and/or truck employees arrive or leave work (production employees would work shifts outside of the peak commute periods). Therefore, traffic impact analyses have focused on the weekday AM and PM peak periods between 7:00-9:00 a.m. and 4:00-6:00 p.m. when both on-street traffic and vehicle trip generation from the project would combine to potentially affect traffic flow.

New AM and PM peak period intersection counts were conducted at the four project study intersections.[2] From these peak period counts, AM and PM peak hour volumes were derived and are shown in Figure 2.

PM peak hour signalized and non-signalized intersection LOS have been calculated using the *Transportation Research Board (TRB), Highway Capacity Manual 2000, Chapters 16 and 17, Signalized and Unsignalized Intersections.* Synchro-Simtraffic software has been used to model intersection operations based on "operations" methodology.

As shown in Table 2, the four project study intersections are operating at acceptable levels (LOS D or better) during the AM and PM peak hours. Periodic vehicle queuing was observed during peak commute periods at all four study intersections. Field observations indicate that peak directional traffic volumes on SR 84 and I-880 in the study area can experience congestion due to accidents, interchange operations, or just significant directional traffic flow. In addition, on-ramps at to I-880 at the Thornton Avenue, Mowry Avenue, and Stevenson Boulevard are all metered and vehicles can queue on these on-ramps. However, this vehicle queuing does not typically affect operation of the signalized off-ramp intersections. In addition, off-ramps have also been observed to experience vehicle queuing depending on commute direction. This occurs during the AM commute hour on the SR 84 eastbound off-ramp at Thornton Avenue. Other arterial corridors within the City of Newark also can experience congestion and these are as follows:

Thornton Avenue between I-880 and Cedar Boulevard; Significant traffic flows in the eastbound and westbound directions. Vehicle queues have been observed for the westbound left-turn movement from Thornton Avenue onto Cedar Boulevard and southbound left-turn movements from Cedar Boulevard onto Thornton Avenue. It is noted that the westbound left-turn storage lane from Thornton Avenue onto Cedar Boulevard was lengthened as part of the Home Depot development to the west some years ago to provide greater vehicle storage.

Thornton Avenue-Willow Street-Central Avenue-Cherry Boulevard-Automall Parkway; During periods of congestion on SR 84 and I-880, these arterials serve as an alternate commute route in order to bypass the freeway congestion and can experience increased congestion at the study intersections along this route. This also can occur along the Thornton Avenue corridor and it's intersections between SR 84 and I-880.

NEAR-TERM (APPROVED/PENDING) PROJECTS METHODOLOGY

Near-term (no project) conditions represent approved/pending projects approved by the City of Newark prior to proposed project development combined with increases in regional traffic growth. This would represent a 2– year period consistent with previous studies. The proposed project development would likely represent a 1–2 year horizon. However, near-term (no project) conditions are conservative in nature. Approved/pending projects likely to affect traffic flows in the general study areas were identified from the

2 Baymetrics Traffic Resources, AM and PM peak period (7:00-9:00 a.m. and 4:00-6:00 p.m.) intersection turning movement counts on Thornton Avenue, Cherry Street, and Mowry Avenue, City of Newark, June 4, 2014.

TABLE 2
EXISTING CONDITIONS: WEEKDAY AM AND PM PEAK HOUR INTERSECTION LOS

#	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Thornton Avenue/Cedar Boulevard	Signal	45.2	D	35.1	D
2	Central Avenue/Cherry Street	Signal	46.5	D	36.4	D
3	Mowry Avenue/Cherry Street	Signal	30.1	C	30.5	C
4	Mowry Avenue/Cedar Boulevard	Signal	25.8	C	30.9	C

Intersection LOS is expressed in seconds of vehicle delay based on HCM 2000 Operations methodology.

recent studies conducted for the City of Newark General Plan Tune Up EIR.[3]

Based on overall growth projections discussed in the EIR Transportation and Traffic section, buildout of the Plan would include an increase of 16,580 residents, 6,208 housing units, and 2,882 jobs over existing Year 2012 base levels. Using these growth estimates, the Alameda County Transportation Commission (ACTC) transportation model was updated to provide Year 2035 traffic volume forecasts.[4] Using the difference between existing Year 2012 baseline volumes and Year 2035 model volumes at each study intersection, existing volumes were increased by a two-year growth ratio based on the uniform 23-year increase in model volumes.

In addition to near-term background growth, the project parcel includes a vacant light-industrial building located on the northeast portion of the parcel. Vehicle access to this site would be gained to/from Cherry Street (only). Although not a portion of the proposed project description, the project applicant could lease this 44,452 square foot building out for other light-industrial type uses. For the purpose of this analysis, this building was assumed to be leased for near-term (no project) conditions. Based on the Institute of Transportation Engineers (ITE) trip research on light-industrial uses, the vacant building would generate the following daily and peak hour trips as shown in Table 3. As calculated, the vacant building would generate 310 daily trips with 41 AM peak hour trips and 43 PM peak hour trips.[5]

NEAR-TERM (NO PROJECT) TRAFFIC VOLUMES

AM and PM peak-hour near-term (no project) volumes have been added to existing intersection volumes based on trip assignments established in the General Plan Tune Up EIR and other light-industrial projects located in Newark and Fremont.

AM and PM peak-hour near-term (no project) traffic volumes have been shown in Figure 3 for the weekday peak hours.

NEAR-TERM (NO PROJECT) INTERSECTION/ROADWAY IMPROVEMENTS

Based on discussions with the City of Newark Engineering staff, selected improvements are being considered for the Mowry Avenue/Cherry Street intersection that could involve increased capacity and circulation for the westbound direction. No other immediate circulation improvements planned in the study area (that would be completed in a one–two year horizon period).[6]

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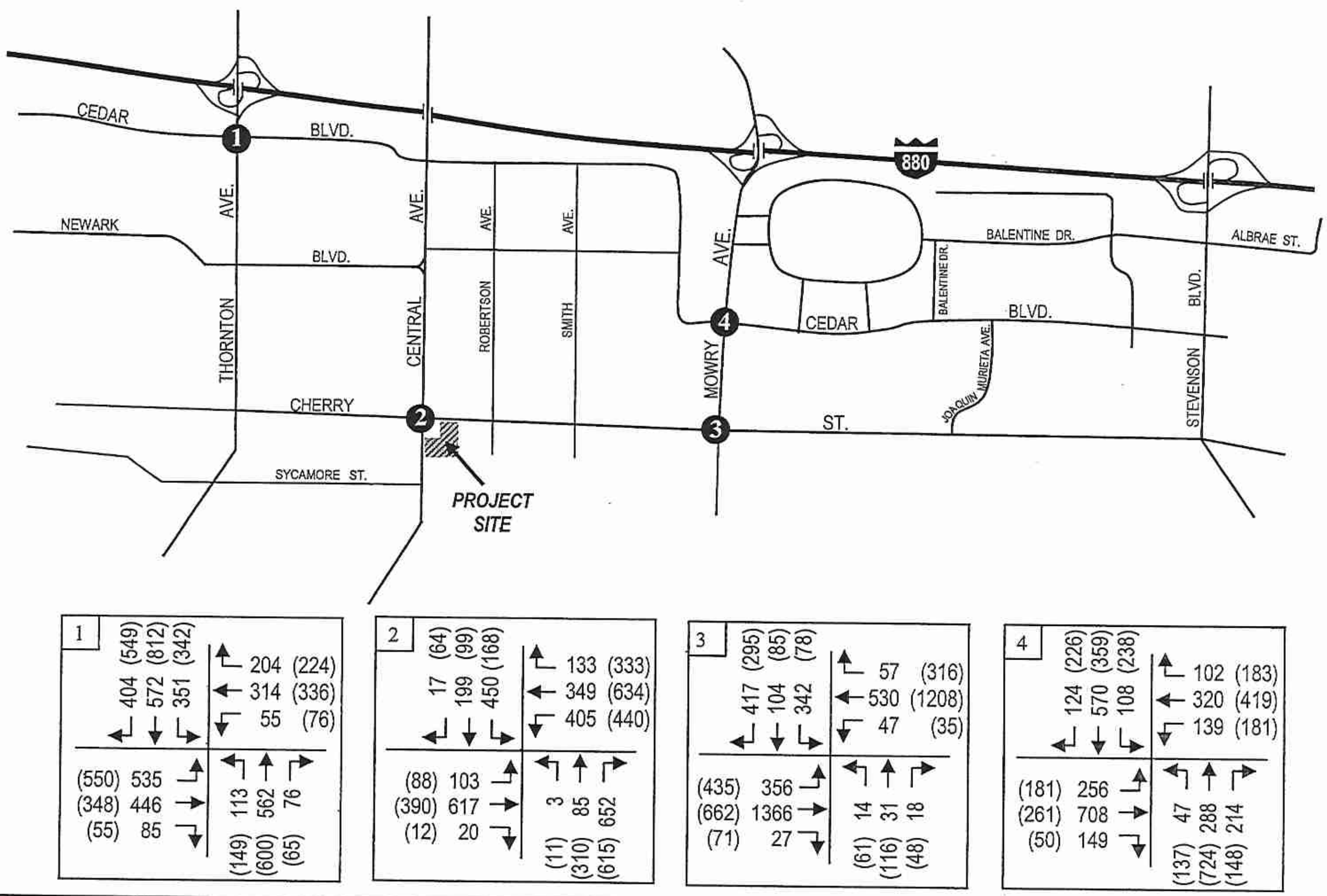
3 Planning Center / DC&E, General Plan Tune UP EIR, Chapter 4, Transportation and Traffic, City of Newark, 2013
4 The Planning Center / DC&E, General Plan Tune Up EIR, Ibid……….
5 Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition, Light-Industrial (#110), 2012.
6 Mr. Soren Fajaeu, City Engineer, City of Newark, Planned roadway improvements, Personal communication, September 11, 2014.



Near Term Weekday A.M. and (P.M.) Peak Hour Volumes

Reference North

omni-means

figure 3

TABLE 3
NEAR-TERM NO PROJECT TRIP GENERATION; DAILY, AM, AND PM PEAK HOUR

Land Use Category	Size	Daily Trip Rate	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out%
Light-Industrial (#110)	1,000 s.f.	6.97	0.92	80	12	0.97	12	88
Proposed Uses	**Size KSF**	**Daily Trips**	**AM Peak Hour Trips**			**PM Peak Hour Trips**		
			Total	**In**	**Out**	**Total**	**In**	**Out**
Light-Industrial	44.45 ksf	310	41	33	8	43	5	38
Net New Project Trips		**310**	**41**	**33**	**8**	**43**	**5**	**38**

Source: Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition, Light-Industrial (#110), Daily and peak hour generation based on average trip rates. s.f. = square feet, ksf = 1,000 square feet

NEAR-TERM (NO PROJECT) INTERSECTION OPERATION

With near-term (no project) traffic added to existing peak-hour traffic volumes, baseline intersection LOS have been calculated and are shown in Table 4. With near-term (no project) volumes, all study intersections would be operating at acceptable levels (LOS D or better) during both the AM and PM peak hours.

TABLE 4
EXISTING AND NEAR-TERM (NO PROJECT) CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY AM AND PM PEAK HOUR

#	Intersection	Control Type	Wkdy. AM LOS/Delay Existing (No Project)	Wkdy. AM LOS/Delay Near-Term (No Project)	Wkdy. PM LOS/Delay Existing (No Project)	Wkdy. PM LOS/Delay Near-Term (No Project)
1	Thornton Avenue/Cedar Boulevard	Signal	C 33.8	D 38.8	C 34.7	D 36.5
2	Central Avenue/Cherry Street	Signal	D 46.5	D 51.2	D 36.4	D 38.7
3	Mowry Avenue/Cherry Street	Signal	C 30.1	C 32.4	C 30.5	C 33.8
4	Mowry Avenue/Cedar Boulevard	Signal	C 25.8	C 26.3	C 30.9	C 32.7

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for signalized intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds.

SIGNIFICANCE CRITERIA

The following standards of significance criteria have been used in this transportation analysis:

- A reduction in intersection service levels below LOS D for signalized intersections. This is based on the City of Newark standard for Level of Service included in the Transportation Element of the General Plan;

- For those intersections operating below LOS D (pre-project), an increase of 1% or more of project-related traffic to an already congested intersection would be considered a significant impact;

- Based on Alameda County Congestion Management Agency (ACCMA) guidelines, should the proposed Mission Linen Light-Industrial Facility project generate over 100 PM peak hour trips *and* represent a General Plan Amendment and/or require a Project Specific Environmental Impact Report (PSEIR), a comprehensive traffic analysis would be conducted on all MTS routes in the study area. The Congestion Management Plan (CMP) requires conducting a supplemental traffic analysis using the latest Countywide Transportation Demand Model for projection years 2015 and 2030.

PROPOSED PROJECT IMPACTS

PROJECT DESCRIPTION

The proposed project would consist of a light-industrial (LI) linen processing facility totaling 109,046 square feet. At full production, the facility could be expected to employ 286 workers made up of administrative, production, and truck/van delivery staff. The project site would be located on the southwest quadrant of the Center Street/Cherry Street intersection (see Project Site Plan – Figure 6). Proposed vehicle access to the project site would be gained from three planned full-access driveways off Central Avenue that would serve truck/van, employee parking, and fire lane access. The processing building would be oriented in a north-south direction on the site with truck access and parking on the east side of the facility and employee parking primarily located on the west side of the building.

PROJECT TRIP GENERATION

Daily and peak hour vehicle trip generation for the proposed project has been based on accepted rates found in the Institute of Transportation Engineers (ITE) trip research manual for light-industrial uses.[7] ITE has conducted extensive research on the trip generation characteristics of both light and heavy industrial uses. Consequently, established rates for proposed project uses are an industry standard used by both consultants and public agencies for measuring the impacts of light industrial uses.

Vehicle trip generation for the proposed project is broken down by daily vehicle trips and "peak hour" vehicle trips. Daily trips are the total vehicle trips generated by the project over a 24-hour period. The peak hour trips are typically generated during the highest hour of the morning (7:00-9:00 a.m.) and evening (4:00-6:00 p.m.) commute periods when weekday traffic is significant. The peak hour rates reflect the amount of traffic that would be generated by the proposed project during the "peak hour of adjacent street traffic." However, it is possible the proposed project could generate a higher amount of trips during some other period during the day. Regardless, the combination of peak hour project trips combined with the peak hour of adjacent street traffic commonly yields a "worst case" scenario for measuring project impacts and vehicle congestion. Typically, the PM peak hour period yields the greatest combination of project trip generation and vehicle congestion.

Specific to proposed project trip generation, it is likely that calculated AM and PM peak hour light-industrial project trips calculated using ITE research are conservative in nature. The project description indicates that the bulk of the employees would be made up of production staff. Production staff work would be accommodated in two work shifts starting at 5:00 a.m. and ending at 9:00 p.m. These work/shift hours would preclude production staff from commuting during the peak hours of adjacent street traffic between 7:00-9:00 a.m. and 4:00-6:00 p.m. In addition, a majority of the route drivers (56 total) would be leaving the facility prior to 7:00 a.m. on their delivery runs. Each driver would complete one delivery route per day returning to the facility prior to 5:00 p.m. Therefore, calculated peak hour trip generation would be conservative.

Daily and peak hour proposed project trip generation is shown in Table 5. Based on 286 employees (maximum), the proposed project is expected to generate 864 daily trips with 126 AM peak hour trips and 120 PM peak hour trips. It is noted these calculations based on total employment result in a more conservative trip generation calculation as compared to trip rates based on building square footage.

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[7] *Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition, Apartments,(land use #220), 2012.*

TABLE 5
PROPOSED PROJECT TRIP GENERATION; DAILY, AM, AND PM PEAK HOUR

Land Use Category	Size	Daily Trip Rate	AM Peak Hour Trip Rate/Unit Total	In %	Out %	PM Peak Hour Trip Rate/Unit Total	In %	Out%
Light-Industrial (#110)	# employees	3.02	0.44	83	17	0.42	21	79
Proposed Uses	**Size Employees**	**Daily Trips**	**AM Peak Hour Trips Total**	**In**	**Out**	**PM Peak Hour Trips Total**	**In**	**Out**
Light-Industrial	286	864	126	106	20	120	25	95
Net New Project Trips		**864**	**126**	**106**	**20**	**120**	**25**	**95**

Source: Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition, Light-Industrial (#110), Daily and peak hour generation based on average trip rate using totals.

PROJECT TRIP ASSIGNMENT

Peak hour trip distribution has been based on existing peak hour traffic volumes at key intersections around the site, area demographics, previous/recent transportation studies for other light-industrial development in the surrounding area, and applicant data related to likely truck delivery areas.[8 9 10] Consideration was also given to project access driveways, access to Interstate 880 and SR084, and adjacent intersections. Based on these factors, the project's peak hour trip distribution is estimated as follows:

Macro Distribution:

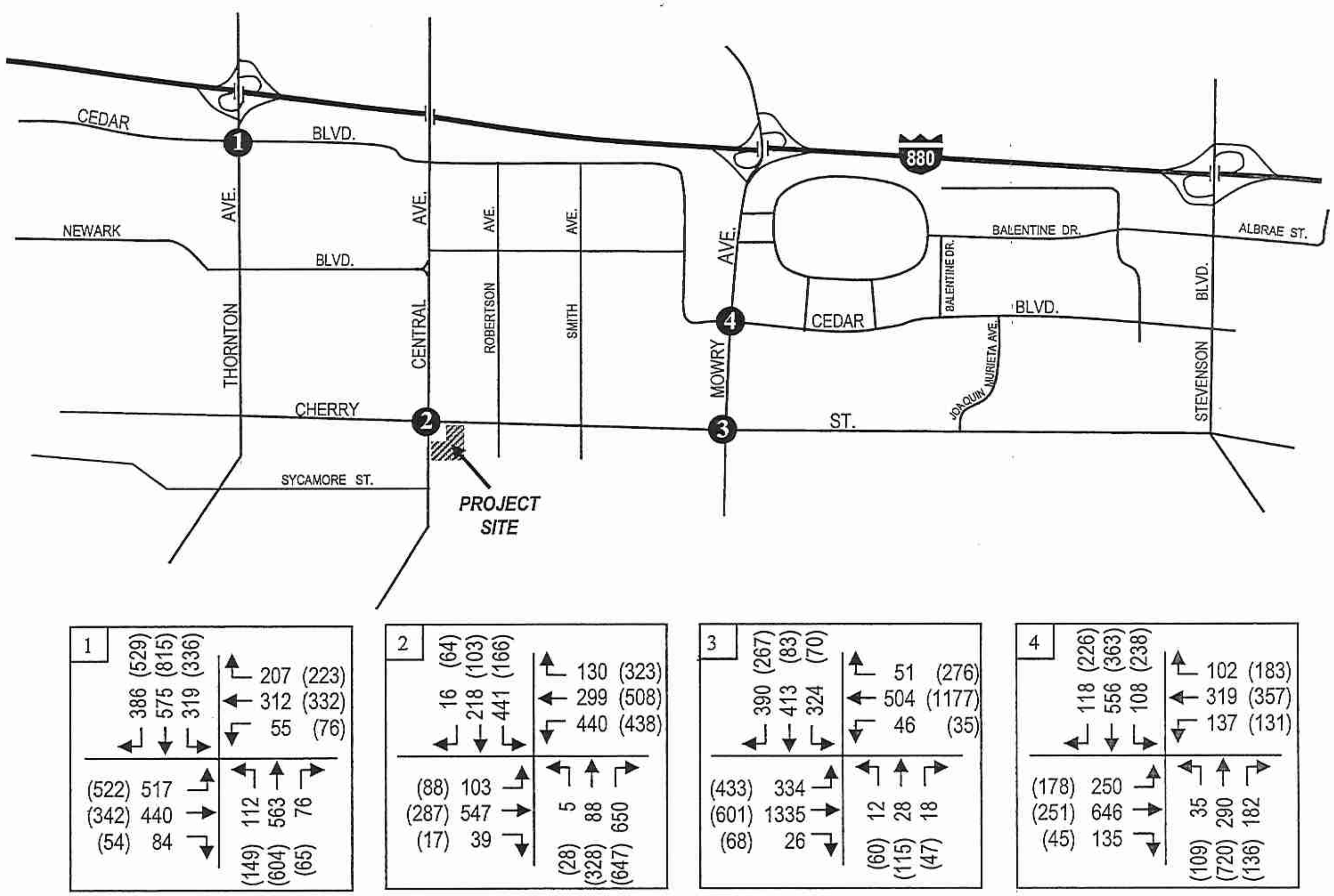
Interstate 880 to/from the north:	28%
Central Avenue to/from the east:	5%
Mowry Avenue to/from the east:	2%
Interstate 880 to/from the south:	20%
Stevenson Boulevard to/from the east:	5%
Boyce Road to/from the south:	10%
SR-84 to/from the west:	25%
Newark Boulevard to/from the north:	5%
Total:	**100%**

***Micro Distribution*:**

Cherry Street to/from the north:	19%
Cherry Street to/from the south:	37%
Central Avenue to/from the east:	19%
Central Avenue to/from the west:	25%
Total:	**100%**

AM and PM peak hour project trips have been added to existing intersection volumes and are shown in Figure 4.

8 Planning Center / DC&E, General Plan Tune UP EIR, Chapter 4, Transportation and Traffic, City of Newark, 2013
9 Fehr & Peers, Transportation Impact Analysis: Warm Springs/South Fremont Community Plan, City of Fremont, December 2013.
10 Mr. Scott Agee, Agee Engineering, Inc., Proposed Newark Mission Linen Facility, Projections for route direction based on existing routes, July, 2014.



Existing + Project Weekday A.M. and (P.M.) Peak Hour Volumes

omni-means

figure 4

EXISTING PLUS PROJECT INTERSECTION OPERATIONS

With AM and PM peak hour project trips added to existing (no project) traffic volumes, study intersection LOS have been calculated and are shown in Table 6. With existing plus project volumes, all four project study intersections would be operating at acceptable levels (LOS D or better) during the AM and PM peak hours. There would be slight increases in vehicle delays at specific intersections. The intersection of Thornton Avenue/Cedar Boulevard would change from LOS C (34.7 seconds) to LOS D (35.3 seconds) with proposed project traffic. However, all intersections would continue to operate at acceptable levels.

TABLE 6
EXISTING AND EXISTING PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY AM AND PM PEAK HOUR

			Wkdy. AM LOS/Delay		Wkdy. PM LOS/Delay	
#	Intersection	Control Type	Existing (No Project)	Existing Plus Project	Existing (No Project)	Existing Plus Project
1	Thornton Avenue/Cedar Boulevard	Signal	C 33.8	C 34.9	C 34.7	D 35.3
2	Central Avenue/Cherry Street	Signal	D 46.5	D 50.6	D 36.4	D 38.5
3	Mowry Avenue/Cherry Street	Signal	C 30.1	C 30.1	C 30.5	C 31.4
4	Mowry Avenue/Cedar Boulevard	Signal	C 25.8	C 25.9	C 30.9	C 31.2

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for signalized intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds.

NEAR-TERM PLUS PROJECT INTERSECTION OPERATIONS

Figure 5 shows AM and PM peak hour project trips added to near-term (no project) traffic volumes. Table 7 shows near-term plus project study intersection LOS. With near-term plus project volumes, the four project study intersections would be operating at acceptable levels (LOS D or better) during the AM and PM peak hours. As with existing plus project conditions, there would be slight increases in vehicle delays at selected intersections. However, the addition of proposed project trips would not be considered significant in nature.

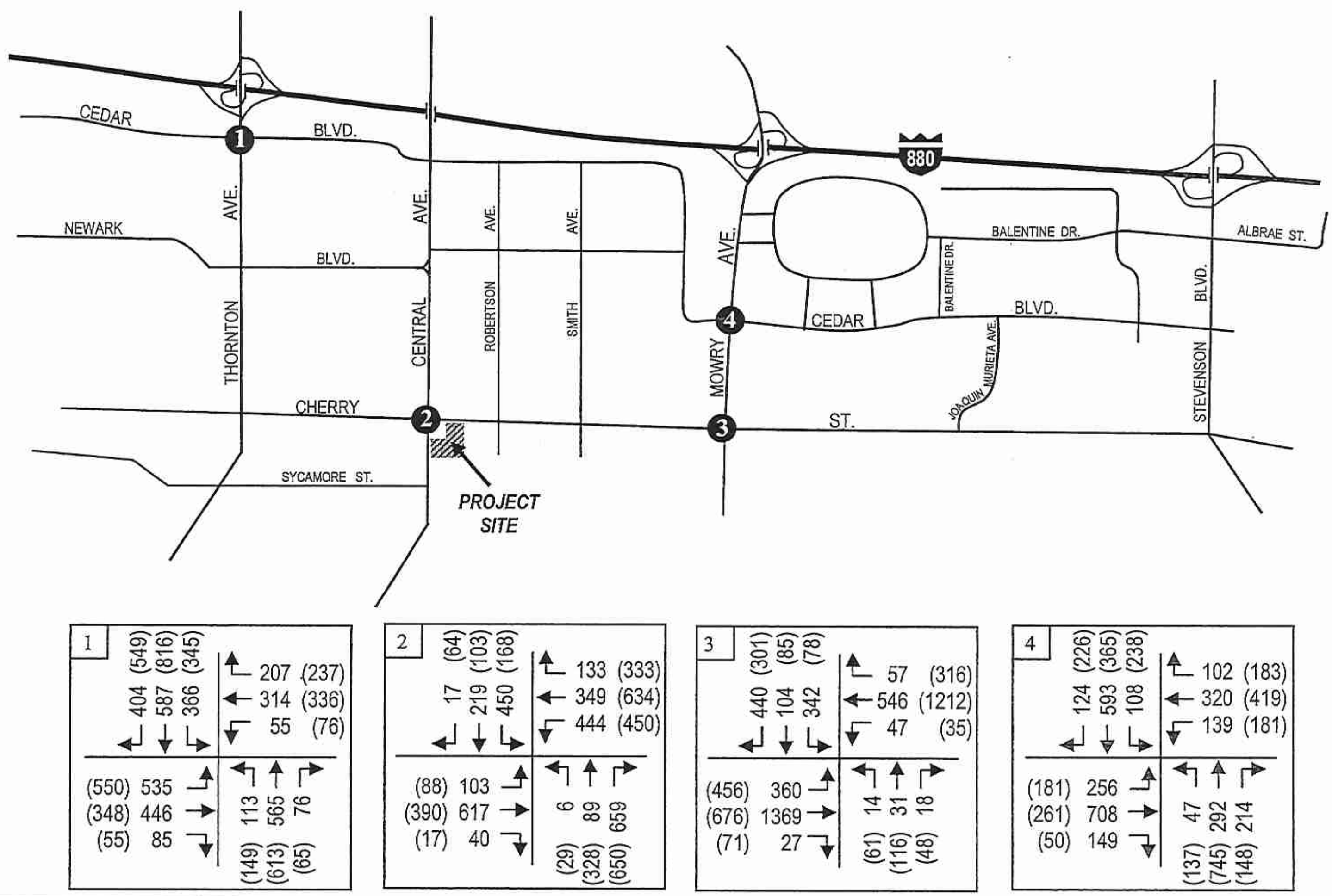
TABLE 7
NEAR-TERM AND NEAR-TERM PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY AM AND PM PEAK HOUR

			Wkdy. AM LOS/Delay		Wkdy. PM LOS/Delay	
#	Intersection	Control Type	Near-Term (No Project)	Near-Term Plus Project	Near-Term (No Project)	Near-Term Plus Project
1	Thornton Avenue/Cedar Boulevard	Signal	D 38.8	D 40.5	D 36.5	D 36.6
2	Central Avenue/Cherry Street	Signal	D 51.2	D 53.4	D 38.7	D 40.2
3	Mowry Avenue/Cherry Street	Signal	C 32.4	C 32.9	C 33.8	C 34.7
4	Mowry Avenue/Cedar Boulevard	Signal	C 26.3	C 26.6	C 32.7	C 33.5

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for signalized intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds.

PROJECT ACCESS/CIRCULATION

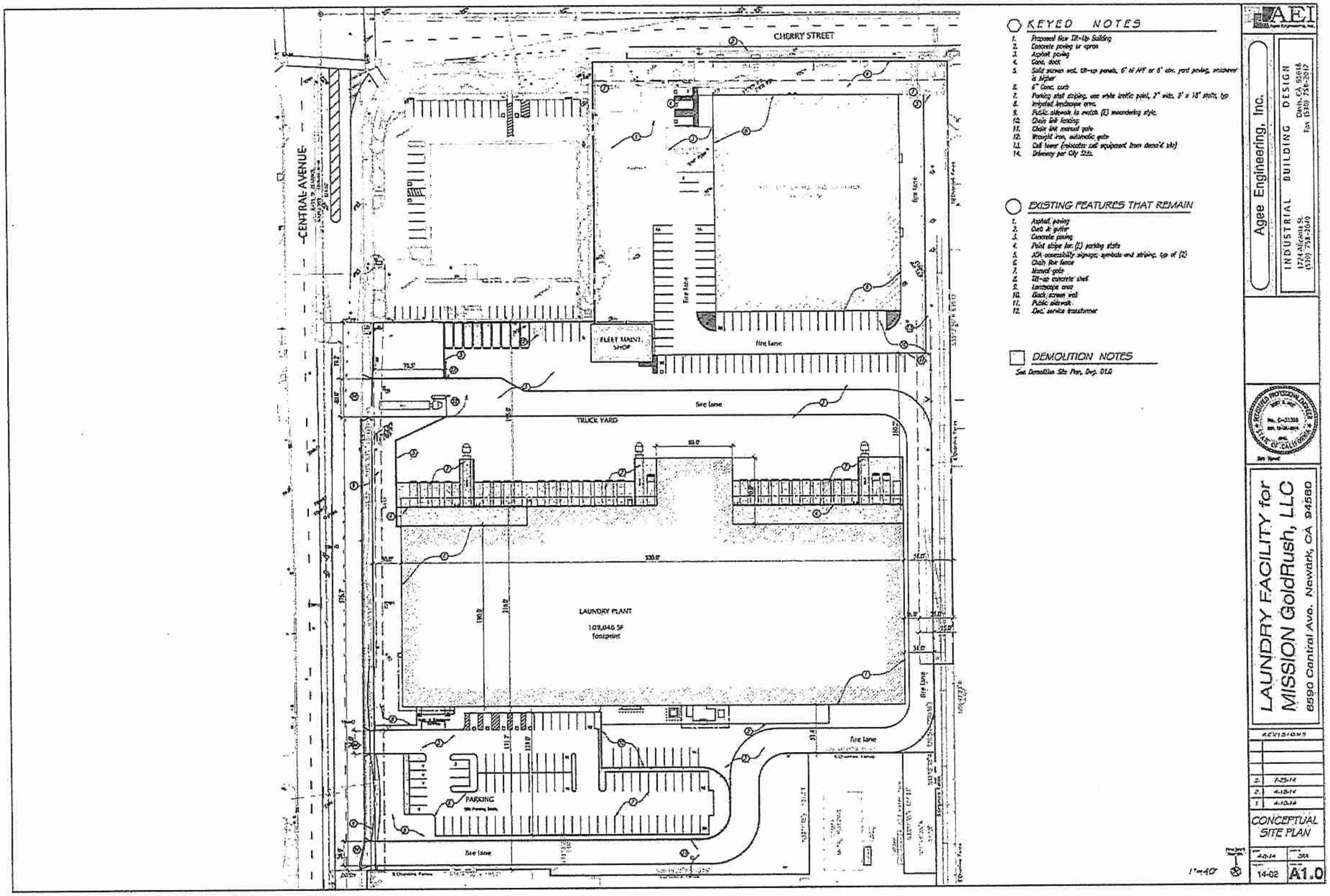
All vehicle and truck/van access to the project site would be gained from Central Avenue. As planned, the proposed project site would be served by three full-access driveways to serve both vehicular and truck/van traffic (see Project Site Plan—Figure 6). The eastern-most project driveway would be located approximately 330 feet south of Cherry Street. With a 40-foot width, this driveway would be designated for all truck/van access and could also be used by vehicle traffic. The mid-site driveway would be located



Near Term + Project Weekday A.M. and (P.M.) Peak Hour Volumes

omni-means

figure 5



Project Site Plan

Reference North

omni-means

figure 6

approximately 685 south of Cherry Street and would serve the primary employee parking areas. Delivery trucks and vans associated with the facility would not use this driveway to access the site. Finally, the western-most driveway would be located approximately 800 feet south of Cherry Street. This driveway would provide access to a wide fire lane (26-feet) that would extend around the entire building on its south side linking the western portion of the site with truck/van loading and parking areas on the east side of the site.

All three driveways would be served by an existing two-way-left-turn-lane (TWLTL) on Central Avenue. Originating 285 feet west of Cherry Street (after an existing raised landscaped median), the TWLTL extends for the entire 560-foot length of the project frontage and continues west well beyond the project boundary (+1,000 ft.).

It is noted that the eastern-most project driveway that would serve proposed delivery truck/van access would have 39 feet of storage capacity for the westbound left-turn movement from Central Avenue into the project site. This is due to the existing raised landscaped median on Central Avenue that extends west from Cherry Street. Due to the location of the eastern project driveway and raised median on Central Avenue, there is only 39 feet of storage in the existing TWLTL for westbound project traffic wishing to access the site. The existing westbound storage capacity on Central Avenue of 39 feet would not be adequate for large trucks (CA-45 or CA-65).

> **TRA-1 Impact**: The existing storage capacity on Central Avenue for westbound access into the eastern-most project driveway would not be adequate for large trucks. Projected storage capacity for the westbound left-turn movement at this project driveway would be 39 feet. However, large trucks would require 45-65+ of storage capacity and this would be considered a *significant impact.*

> **TRA-1 Mitigation**: It is recommended that all inbound large trucks be required to access the project to/from the west on Central Avenue and/or restrict inbound left-turn access for large trucks to the western-most driveway. This would allow large trucks to travel eastbound on Central Avenue into the project site and avoid potential storage capacity conflicts at the eastern-most project driveway. The other large truck access option would be to travel westbound on Central Avenue to the very western-most driveway to make inbound left-turn movements with adequate storage capacity (*less-than-significant*).

Proposed project driveway operation has been evaluated for existing plus project conditions for both the AM and PM peak hour (see LOS calculation sheets---Appendices). All project driveways on Central Avenue would operate at acceptable conditions (LOS C or better) during the peak hours with proposed project traffic. The middle (mid-block) driveway providing access to the main employee parking areas would experience the highest driveway volumes and would be operating at LOS C (15.3 seconds of delay) during the PM peak hour. The existing two-way-left-turn-lane on Central Avenue would allow employee traffic to decelerate and/or merge into through volumes on Central Avenue without disrupting north-south through-traffic on Central Avenue.

INTERNAL CIRCULATION

From the project's eastern-most access driveway off Central Avenue, delivery trucks/vans would turn south into the driveway. All truck/van loading docks and would be located against the eastern side of building facility. Additional truck/van parking areas would be located along the northeast portion of the site where the fleet maintenance shop building is located. South of the fleet maintenance shop building, additional perpendicular parking stalls would located along the project's eastern frontage and these would could accommodate vehicular parking. Truck and van turning radii would be adequate between the facility building's loading docks and eastern frontage areas (to be determined by project applicant's civil engineers).

Vehicle access to the project's mid-block driveway would be adequate with at least 300 feet of storage capacity within the existing TWLTL for westbound left-turn movements. This driveway would primarily serve the project employees main parking field. Employees and/or visitors would enter the parking field area and circulate through the parking areas in either a clockwise or counter-clockwise direction to access perpendicular (90 degree) parking spaces. An enclosed internal loop with 24-foot drive aisles, all vehicles would be required to access outbound the same mid-block driveway after leaving the parking areas. To promote vehicle circulation within the parking areas, the short east-west parking aisle adjacent to Central Avenue should be stop-sign controlled (less-than-significant).

The western-most driveway would serve vehicular and/or truck traffic and provide access to the fire lane that would extend around the entire facility in addition to providing access to a limited parking area (west side). Vehicle storage on Central Avenue for westbound left-turn movements would be adequate (120 feet) given the relatively low volume traffic to/from this driveway. No vehicle or truck parking would be allowed along this internal fire lane.

TRUCK TRAFFIC

The vast majority of truck traffic to/from the project site would be made up of large delivery vans (41 vans; 18-feet in length). At full production, the project applicant estimates there would be 56 delivery vans. The remaining delivery trucks would be made up of 40-foot bobtail box trucks. The facility would have one large truck (semi-tractor/trailer 65-feet length). With respect to delivery vans, these vans would have one route per day and generate two daily trips (1 inbound, 1 outbound). Delivery vans would leave the facility within the first two hours of the morning shift and would return from their routes over the afternoon period (typically before 5:00 p.m.). The large semi-tractor/trailer truck would generate two daily trips. However, this large truck would generally operate outside the peak commute periods arriving at the facility around 9:30 p.m. and leaving the facility at 12:00 midnight.

PARKING

The proposed project's employee parking supply would be provided by surface parking areas located on both the east and west sides of the main processing building. Excluding parking bays/stalls reserved for truck activity (trucks would be self-parked), employee parking on the east side would be made up of 29 perpendicular parking spaces located against the northeast perimeter of the site. On the west side of the facility building, 98 parking spaces would be available for employee parking. From these 98 spaces, 87 parking spaces would be accessed by the mid project driveway to the main parking field areas. The remaining 11 parking spaces would be located on the southwest side of the building and accessed by the fire lane driveway. There would be 127 total employee parking spaces (perpendicular) on the east and west sides of the facility.

Based on the City of Newark's municipal code parking requirements, warehousing, manufacturing, and industrial uses require one (1) parking space for each of the first 50 employees, plus one (1) parking space for each additional one and one-half employees up to 100 employees, plus one (1) parking space for each additional two employees in excess of 100, provided that the number of spaces shall not be less than one for each one thousand square feet of gross floor area.[11] The City's parking codes for light-industrial uses clearly assume some portion of ridesharing between employees. After companies exceed 50 employees, the parking code rate eases to allow one parking space per 1.5 employees. Once companies exceed 100 employees, the parking code allows one parking space per 2.0 employees. This code reflects the trend of large warehouse and/or industrial buildings using fewer employees as efficiency increases.

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11 City of Newark, Code of Ordinances, Supplemental History Table, Title 17, Zoning, Chapter 17.60.090—Off-Street Parking and Loading, Article II, Off-Street Parking, Specific requirements, Warehouse, manufacturing, industrial uses , 2014.

Using the total employment count of 286, overall employment categories could be summarized as follows:

•	Office Employees:	23
•	Route Employees:	40
•	Production Employees:	223 (Over two shifts—112 each)
	Total Employees:	**286**

Based on discussions with the project applicant, the production employees would be divided into two (2) working shifts. To avoid parking demand overlap, these shifts would be staggered during the mid-day. The first production shift would begin at 5:00 a.m. and end at 1:30 p.m. The second production shift would begin at 2:30 p.m. extending to close. Therefore, the maximum employees on-site at any one time would equal 175 (23 + 40 + 112). Using these City code requirements, the proposed project's parking requirements have been calculated as follows:

Parking Demand Calculations	
50 employees x 1 space/employee	**= 50 spaces**
50 employees / 1.5 employees x 1 space/employee	= 33 spaces
75 employees / 2 employees x 1 space/employee	= 38 spaces
Total Required Parking:	**= 121 spaces**

Based on an overall supply of 127 employee parking spaces, there would be a surplus of six (6) parking spaces based on City code requirements.

CUMULATIVE (YEAR 2035) TRAFFIC CONDITIONS

METHODOLOGY

Cumulative Year 2035 (no project) traffic conditions have been evaluated based on the following source:[12]

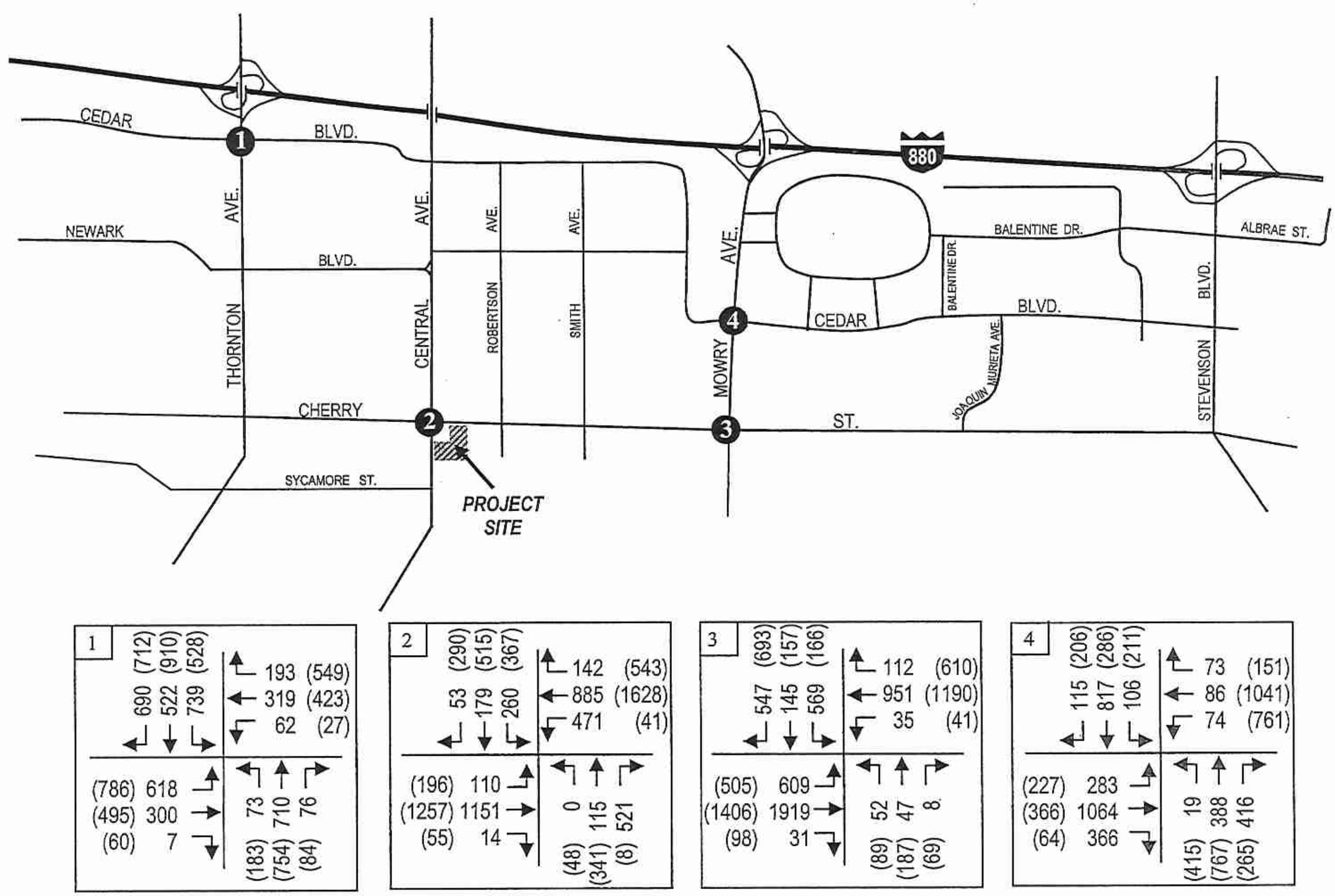
- Year 2035 AM and PM peak hour study intersection volumes supplied by recent City of Newark General Plan Tune Up EIR.

Cumulative year 2035 (no project) volumes for the study area were taken directly from the transportation and traffic section performed for the City of Newark General Plan Tune Up EIR.[13] As noted in the near-term (no project) section, future volume projections were based on City of Newark buildout projections associated with residents, housing units, and jobs. The Alameda County Transportation Commission (ACTC) transportation model was then updated to reflect these buildout projections for the City of Newark for the 2035 horizon year.

Since cumulative year 2035 (no project) volumes contain land uses on the project site consistent with current zoning (general light-industrial), proposed project trips would likely be consistent with maximum development potential of the site and assumed in the City's General Plan buildout projections. Therefore, proposed project trips were subtracted from Year 2035 volume projections to produce cumulative year 2035 (no project) volumes.

AM and PM peak hour cumulative year 2035 (no project) intersection volumes are shown in Figure 7.

12 Planning Center / DC&E, General Plan Tune UP EIR, Chapter 4, Transportation and Traffic, City of Newark, 2013
13 Planning Center / DC&E, General Plan Tune UP EIR, Chapter 4, Transportation and Traffic, City of Newark, 2013



Cumulative Weekday A.M. and (P.M.) Peak Hour Volumes

omni-means

figure 7

CUMULATIVE YEAR 2035 (NO PROJECT) CIRCULATION IMPROVEMENTS

The transportation analysis conducted for the City of Newark General Plan Tune Up EIR assumed the transportation network for Year 2035 would be same as described under Existing Conditions. Specific signal timing improvements were assumed at project study intersections related to peak hour factors and right-turn overlap phasing in the GP Tune Up EIR.

CUMULATIVE YEAR 2035 (NO PROJECT) CONDITIONS

With Year 2035 cumulative (no project) traffic volumes, the four project study intersections would be operating at LOS D during either the AM or PM peak hour as shown in Table 8. However, all intersections would be experiencing high LOS D operations with increased vehicle traffic on main arterial routes of Thornton Avenue, Cherry Street, and Mowry Avenue as a result of buildout of the City's General Plan.

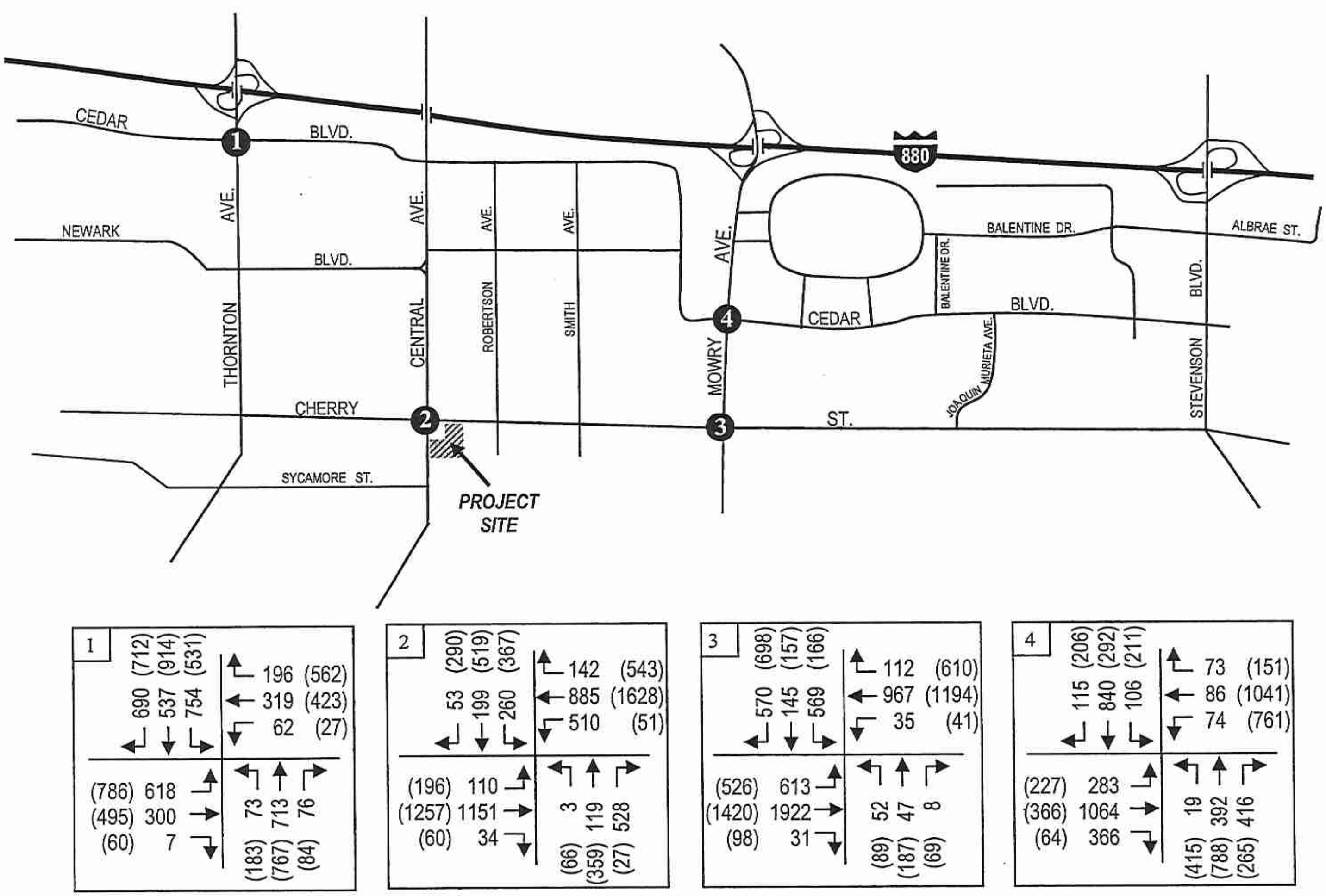
TABLE 8
CUMULATIVE AND CUMULATIVE PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY AM AND PM PEAK HOUR

#	Intersection	Control Type	Wkdy. AM LOS/Delay		Wkdy. PM LOS/Delay	
			Cumulative (No Project)	Cumulative Plus Project	Cumulative (No Project)	Cumulative Plus Project
1	Thornton Avenue/Cedar Boulevard	Signal	D 53.6	D 54.5	D 47.9	D 48.6
2	Central Avenue/Cherry Street	Signal	D 45.8	D 49.3	D 45.3	D 47.8
3	Mowry Avenue/Cherry Street	Signal	D 40.3	D 41.4	D 46.3	D 48.2
4	Mowry Avenue/Cedar Boulevard	Signal	C 34.7	C 34.7	D 54.1	D 54.3

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for signalized intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds.

CUMULATIVE YEAR 2035 PLUS PROJECT CONDITIONS

Figure 8 shows proposed project trips added to cumulative year 2035 (no project) volumes. With proposed project volumes, cumulative year 2035 intersection LOS would remain at LOS D at the adjacent project study intersections along Thornton Avenue, Cherry Street, and Mowry Avenue . As shown in Table 8, all project study intersections would continue to operate at LOS D or better during the AM and PM peak hours with slight increases in vehicle delays due to proposed project traffic.



Cumulative + Project Weekday A.M. and (P.M.) Peak Hour Volumes

Reference North

omni-means

figure 8