City of SACRAMENTO
Community Development

300 Richards Blvd., 3rd Floor
Sacramento, CA 95811

Help Line: 916-264-5011
CityofSacramento.org/dsd

MITIGATED NEGATIVE DECLARATION

The City of Sacramento, California, a municipal corporation, does hereby prepare, declare, and publish this Mitigated Negative Declaration for the following described project:

Osage Warehouse Project (DR21-163): The 9.51-acre project site is located northeast of the intersection of South Watt Avenue and Osage Avenue in the City of Sacramento, California (Assessor's Parcel Number 062-0030-012). The project site is undeveloped and surrounding existing uses include industrial uses to the north and west, single-family residences to the south, and a junkyard and single-family residences to the east. The City of Sacramento General Plan designates the site as Industrial and the site is zoned Heavy Industrial (M-2(S)-R).

The Osage Warehouse Project (proposed project) would include development of a 115,468-square foot (sf) warehouse building with a floor area ratio of 0.28. The proposed project would include a surface parking lot with 116 vehicle parking stalls and 14 loading docks. Primary vehicle access would be provided by Osage Avenue to the south.

The Lead Agency is the City of Sacramento. The City of Sacramento, Community Development Department, has reviewed the proposed project and, on the basis of the whole record before it, has determined that there is no substantial evidence that the project, with mitigation measures as identified in the attached Initial Study, would have a significant effect on the environment. This Mitigated Negative Declaration reflects the lead agency's independent judgment and analysis. An Environmental Impact Report is not required. This Mitigated Negative Declaration has been prepared pursuant to the California Environmental Quality Act (Public Resources Code [PRC] Sections 21000 et seq.), CEQA Guidelines (Title 14, Sections 15000 et seq. of the California Code of Regulations [CCR]), the Sacramento Local Environmental Regulations (Resolution 91-892), and the Sacramento City Code.

A copy of this document and all supportive documentation may be reviewed through the City's website at https://www.cityofsacramento.org/Community-Development/Planning/Environmental/ Impact-Reports.

Environmental Services Manager, City of Sacramento, California, a municipal corporation

By: Scott Johnson

Date: June 27, 2022

OSAGE WAREHOUSE PROJECT
(DR21-163)

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION FOR ANTICIPATED SUBSEQUENT PROJECTS UNDER THE 2035 GENERAL PLAN MASTER EIR

This Initial Study has been prepared by the City of Sacramento, Community Development Department, 300 Richards Boulevard, Third Floor, Sacramento, CA 95811, pursuant to the California Environmental Quality Act (PRC Sections 21000 *et seq.*), CEQA Guidelines (Title 14, Section 15000 *et seq.* of the CCR) and the Sacramento Local Environmental Regulations (Resolution 91-892) adopted by the City of Sacramento.

ORGANIZATION OF THE INITIAL STUDY

This Initial Study is organized into the following sections:

SECTION I - BACKGROUND: Provides summary background information about the project name, location, sponsor, and the date this Initial Study was completed.

SECTION II - PROJECT DESCRIPTION: Includes a detailed description of the proposed project.

SECTION III - ENVIRONMENTAL CHECKLIST AND DISCUSSION: Reviews proposed project and states whether the project would have additional significant environmental effects (project-specific effects) that were not evaluated in the Master EIR for the 2035 General Plan.

SECTION IV - ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: Identifies which environmental factors were determined to have additional significant environmental effects.

SECTION V - DETERMINATION: States whether environmental effects associated with development of the proposed project are significant, and what, if any, added environmental documentation may be required.

REFERENCES CITED: Identifies source materials that have been consulted in the preparation of the Initial Study.

APPENDICES: Appends technical information that was referenced as attached in the preparation of the Initial Study.

SECTION I - BACKGROUND

Project Name and File Number:	Osage Warehouse Project (DR21-163)
Project Location:	8981 Osage Avenue Sacramento, CA 95829 Assessor's Parcel Number (APN) 062-0030-012
Project Applicant:	Panattoni Development 8775 Folsom Blvd., Suite 200 Sacramento, CA 95826
Project Planner:	Kevin Valente, Contract Planner (916) 372-6100 kvalente@raneymanagement.com
Environmental Planner:	Scott Johnson, Senior Environmental Planner (916) 808-5842 srjohnson@cityofsacramento.org
Date Initial Study Completed:	June 2022

This Initial Study was prepared in accordance with the California Environmental Quality Act (CEQA) (PRC Sections 1500 *et seq*.). The Lead Agency is the City of Sacramento.

The City of Sacramento, Community Development Department, has reviewed the proposed project and, on the basis of the whole record before it, has determined that the proposed project is an anticipated subsequent project identified and described in the 2035 General Plan Master EIR and is consistent with the land use designation and the permissible densities and intensities of use for the project site as set forth in the 2035 General Plan. See CEQA Guidelines Section 15176 (b) and (d).

The City has prepared the attached Initial Study to review the discussions of cumulative impacts, growth inducing impacts, and irreversible significant effects in the 2035 General Plan Master EIR to determine their adequacy for the project (see CEQA Guidelines Section 15178(b),(c)) and identify any potential new or additional project-specific significant environmental effects that were not analyzed in the Master EIR and any mitigation measures or alternatives that may avoid or mitigate the identified effects to a level of insignificance, if any.

As part of the Master EIR process, the City is required to incorporate all feasible mitigation measures or feasible alternatives appropriate to the project as set forth in the Master EIR (CEQA Guidelines Section 15177(d)). Policies included in the 2035 General Plan that reduce significant impacts identified in the Master EIR are identified and discussed. See also the Master EIR for the 2035 General Plan. The mitigation monitoring plan for the 2035 General Plan, which provides references to applicable general plan policies that reduce the environmental effects of development that may occur consistent with the general plan, is included in the adopting resolution for the Master EIR. See City Council Resolution No. 2015-0060, beginning on page 60. The resolution is available at the City's EIR webpage listed below.

This analysis incorporates by reference the general discussion portions of the 2035 General Plan Master EIR. (CEQA Guidelines Section 15150(a)). The Master EIR is available for public review at the City of Sacramento's website listed below.

A copy of this document and all supportive documentation may be reviewed in person by appointment at the City of Sacramento, Community Development Department's Public Counter, at 300 Richards Boulevard, 3rd Floor, Sacramento, CA 95811 and at the Sacramento Public Library's Central branch, located at

828 I St., Sacramento, CA 95814. This document and all supportive documentation may also be downloaded through the City's website at:

https://www.cityofsacramento.org/Community-Development/Planning/Environmental/Impact-Reports

The City is soliciting views of interested persons and agencies on the content of the environmental information presented in this document. Written comments should be sent at the earliest possible date, but no later than the 30-day review period ending July 29, 2022.

Please send written responses to:

Scott Johnson, Senior Environmental Planner
Community Development Department
City of Sacramento
300 Richards Boulevard, 3rd Floor
Sacramento, CA 95811
Direct Line: (916) 808-5842
srjohnson@cityofsacramento.org

SECTION II - PROJECT DESCRIPTION

INTRODUCTION

Section II of the Initial Study provides a description of the proposed project and includes discussions on the project location, existing conditions, surrounding land uses, and project description.

PROJECT LOCATION, EXISTING CONDITIONS, AND SURROUNDING LAND USES

The 9.51-acre project site is located northeast of the intersection of Osage Avenue and South Watt Avenue, at 8981 Osage Avenue, in the City of Sacramento, California (APN 062-0030-012) (see Figure 1). The site is approximately 2.5 miles south of State Highway 50 (El Dorado Freeway) and approximately three miles south of the American River.

The project site is located within the Fruitridge Broadway Community Plan. The City of Sacramento General Plan designates the site as Industrial and the site is zoned Heavy Industrial (M-2(S)-R). The site is currently undeveloped, with the exception of two transmission line towers located on the eastern edge of the site. The associated transmission lines transect the project site diagonally, intersecting the project site's northern and eastern boundaries and travelling above the project site's northeastern corner.

Surrounding land uses include single-family residences to the east and south, industrial uses to the north and west, and a junkyard to the east. It is noted that the eastern boundary of the project site is the City limits. Morrison Creek crosses underneath South Watt Avenue approximately 450 feet south of the project site and flows roughly parallel to Osage Avenue, south of the single-family residences (see Figure 2).

PROJECT DESCRIPTION

The proposed project would include development of a single warehouse building and two bioretention areas. A discussion of the project's components, construction phasing, site access and circulation, landscaping, utility infrastructure, and project entitlements, is included below.

Proposed Warehouse

The proposed project would develop a 115,468-square-foot (sf) warehouse building with a floor area ratio of 0.28 (see Figure 3). The proposed warehouse would have a maximum building height of 43 feet (see Figure 4). An outdoor break area would be located near the northeast corner of the proposed building, and an eight-foot-tall concrete masonry unit (CMU) sound wall would be installed along a portion of the eastern site boundary. In addition, a trash enclosure would be located in the northwestern corner of the building.

The building would be Type VB construction, with site cast, tilted concrete panels with a variety of architectural enhancements, including accent paint and metal panel siding. Metal siding and painted metal canopy would enhance the areas around the building entries. The proposed project would incorporate a variety of sustainable materials, including heat reflecting roof membranes, light pollution reduction, low volatile organic compound (VOC)-emitting sealant, adhesives, coatings, floorings, and wood materials. The roof structures would be designed to accommodate additional weight for roof-top photovoltaic electricity generation panel arrays.

Construction Phasing

Construction of the proposed project is anticipated to continue over a span of approximately eight months. Construction would not require any buildings to be demolished; only the removal of a concrete pad currently at the site would be required, which is expected to take approximately one week. Site preparation is expected to take approximately two weeks. Grading the project site is expected to take three to four weeks.

Figure 1
Regional Project Location

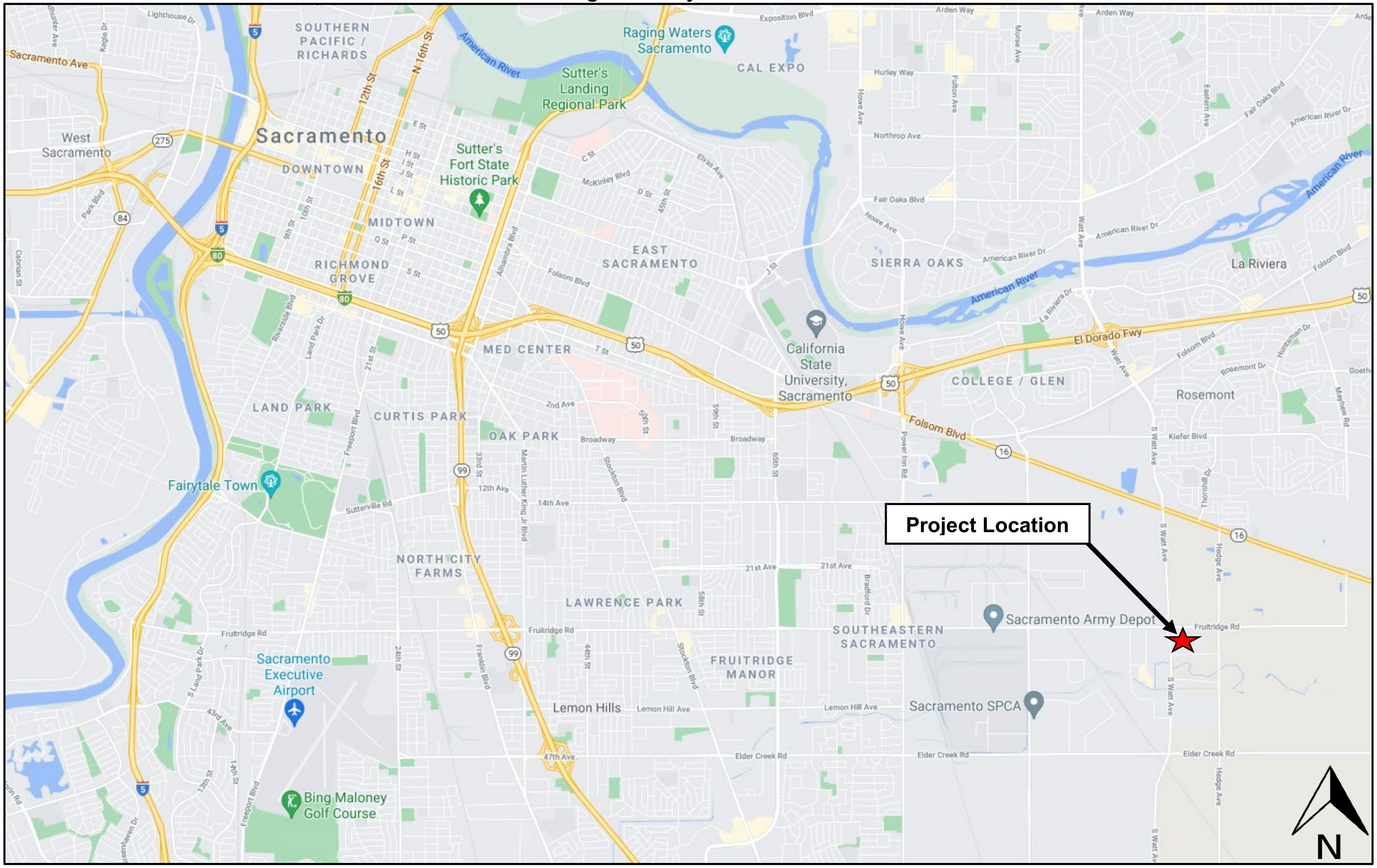
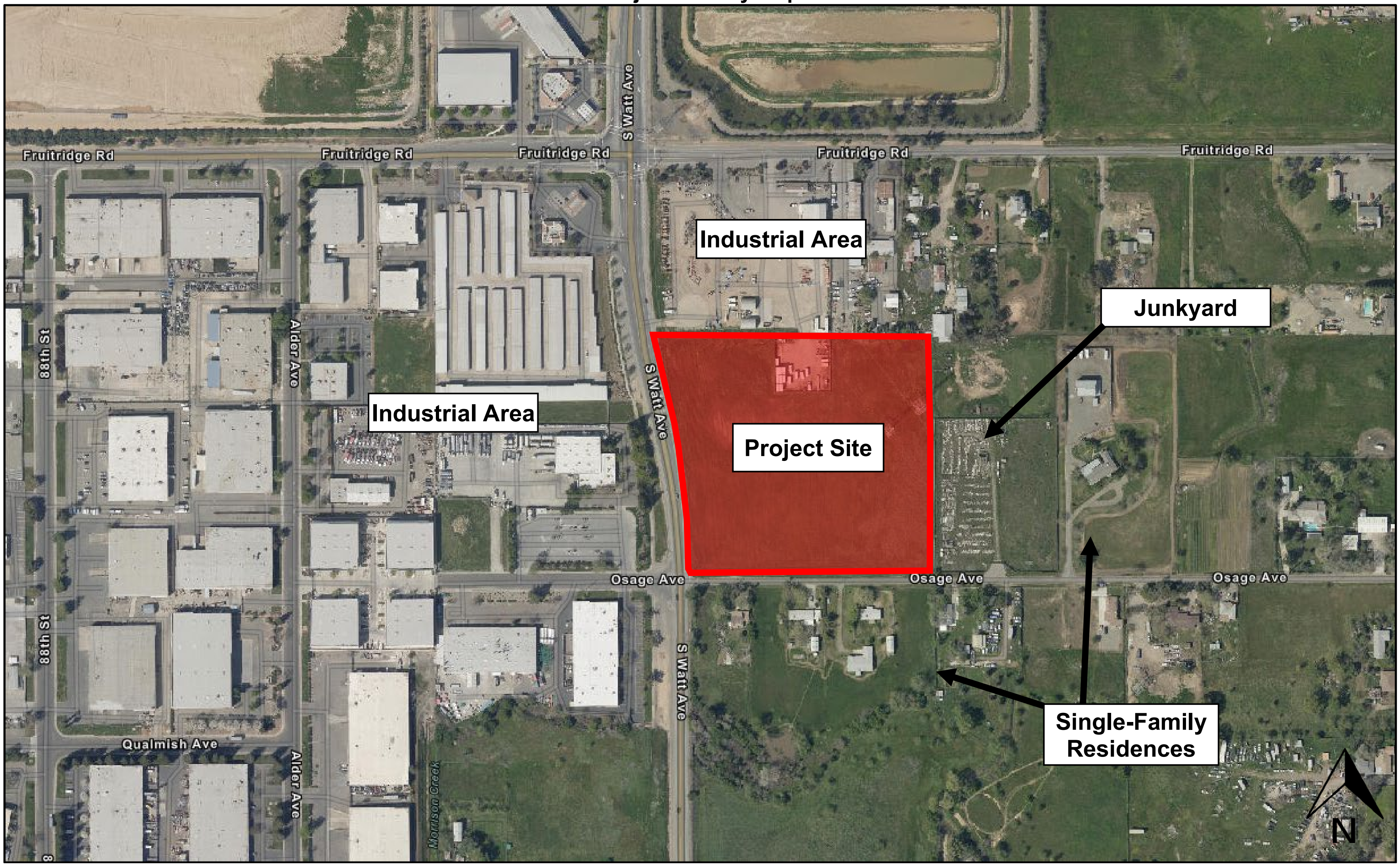


Figure 2
Project Vicinity Map



Note: Project Site Boundaries are approximate.

Figure 3
Site Plan

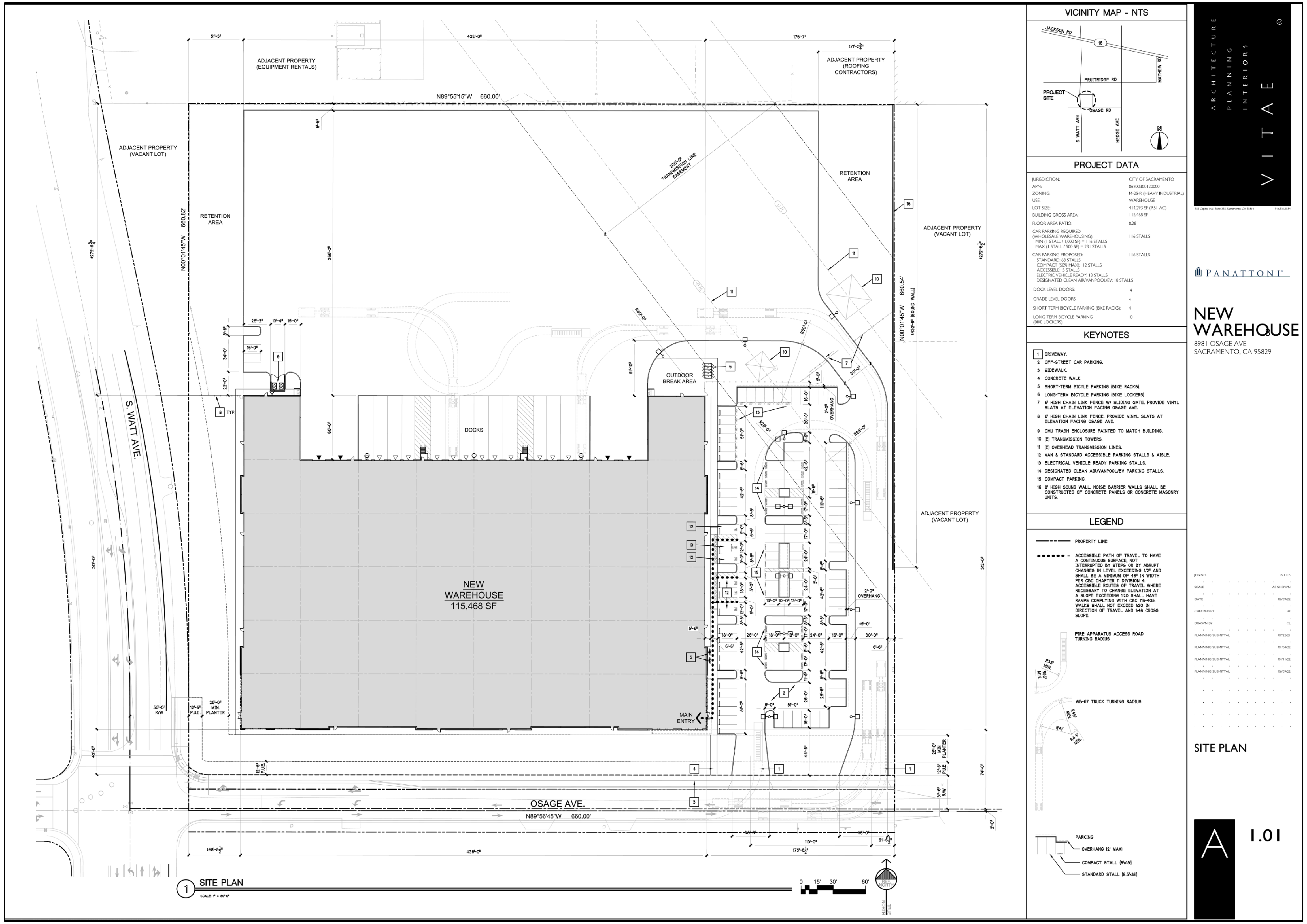


Figure 4
Building Elevations

Site Access, Parking, and Circulation

Access to the project site would be provided by two new driveways from Osage Avenue, located east of the proposed warehouse (refer to Figure 3). The western driveway would provide access to the surface parking lot, while the eastern driveway would provide access to the loading docks in the rear of the building. A six-foot-tall chain link fence with a sliding gate would be installed at the eastern driveway in order to limit access to the loading dock area. In addition, a concrete sidewalk would be installed along Osage Avenue, and would provide pedestrian access from Osage Avenue to the primary entrance to the warehouse.

The proposed project would include a primary surface parking lot to the east of the proposed warehouse, and a small four-space parking lot northwest of the proposed warehouse. The parking areas would include a total of 116 stalls, including 68 standard stalls, 12 compact stalls, five accessible stalls, 13 electric vehicle stalls, and 18 designated clean air vehicle stalls. Fourteen loading docks would be provided on the northern side of the building. In addition, four bicycle racks and ten bike lockers would be provided on-site.

Landscaping

The landscaping plan for the proposed project is included as Figure 5. As presented therein, trees, shrubs, and groundcover would be provided throughout the project site, including the Osage Avenue frontage, the northwestern perimeter of the site, and throughout the parking areas. The proposed plant species would include, but are not limited to, crape myrtle, forest green oak, frontier elm, cork oak, heavenly bamboo, society garlic, blue fescue, and more. Primarily low water-use species would be used, and the landscaping plan would achieve 50 percent shade in the parking area in 15 years.

Additionally, the development would include two bioretention areas, which would be landscaped with coffeeberry and blue rush. The proposed bioretention areas are discussed in further detail under Stormwater Drainage, below.

Utility Infrastructure

The following discussion relates to the water, wastewater, and stormwater drainage infrastructure components of the proposed project (see Figure 6).

Water

The project site is currently undeveloped and would therefore require connection to the municipal water supply provided by the City of Sacramento Department of Utilities. The City uses surface water from the American and Sacramento rivers as well as groundwater north of the American River to meet the City's demands.

Domestic water would be provided through new connections to the existing 12-inch water main in South Watt Avenue and/or the 12-inch water main in Osage Avenue. In addition, a new water line for fire protection would extend around the proposed warehouse, and seven fire hydrants would be installed around the building perimeter.

Wastewater

Development the project site would require connection to sewage and wastewater treatment infrastructure, which would be provided by the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD). Wastewater generated in the project area is collected in the SASD system through a series of sewer pipes and pump stations. Once collected in the SASD system, wastewater flows into the SRCSD interceptor system, where the wastewater is conveyed to the Sacramento Regional Wastewater Treatment Plant (SRWWTP). The SRWWTP is owned and operated by the SRCSD and provides sewage treatment for the entire City. SASD requires each building with a wastewater source on each lot to have a separate connection to SASD's sewer system. As part of the proposed project, a new six-inch sanitary sewer line would direct wastewater from the proposed warehouse to the existing 10-inch sewer main in Osage Avenue.

Figure 5
Landscape Plan

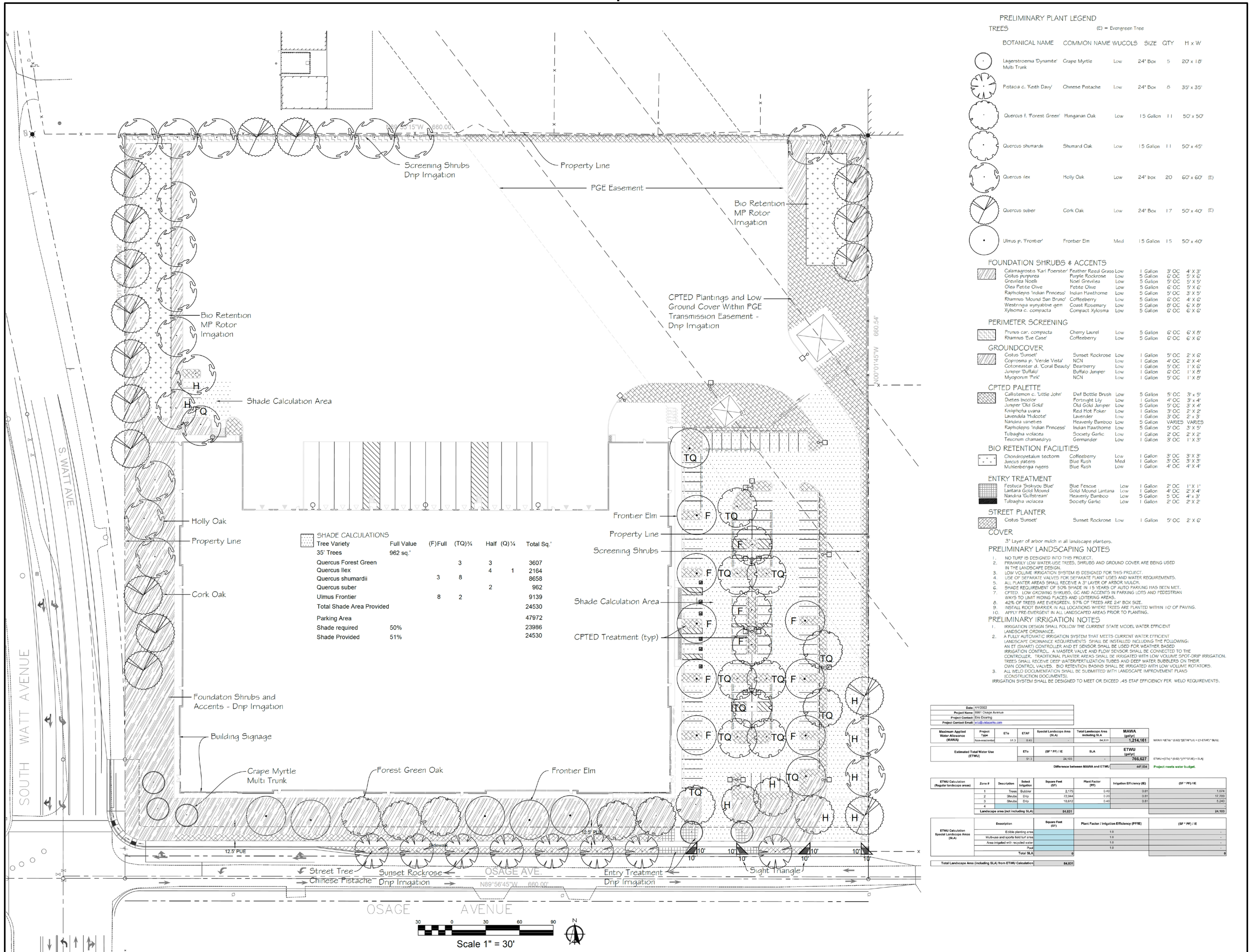
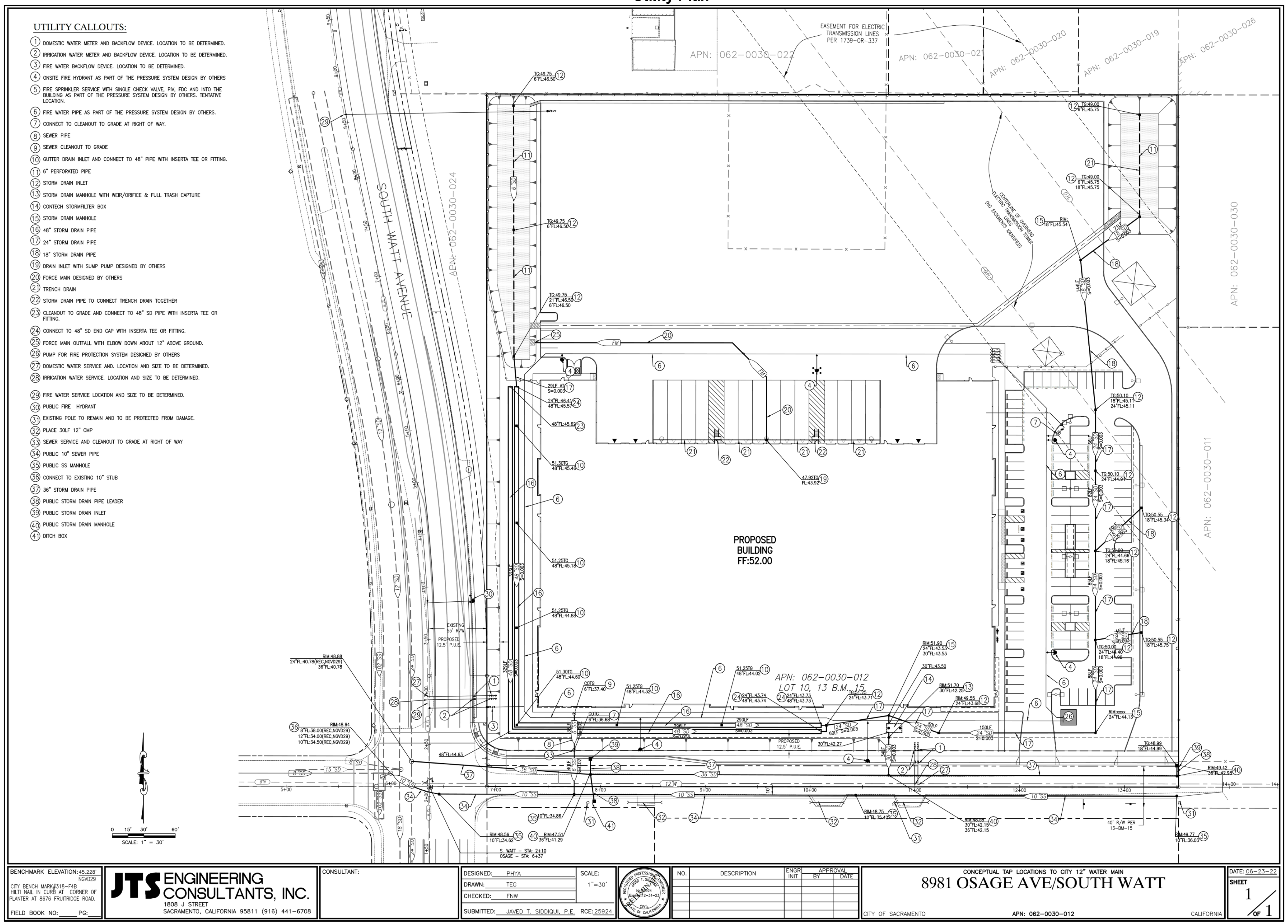


Figure 6
Utility Plan



Stormwater Drainage

The City's Department of Utilities provides storm drainage service throughout the City by using drain inlets, pumps, and canals. Stormwater is transported to the SRCSD's SRWWTP, where runoff is then treated prior to discharge into the Sacramento River.

All stormwater runoff from impervious surfaces, such as roofs and pavement, would be directed by curbs and gutters into new stormwater lines on the project site. Runoff from the northern portion of the project site would be directed towards a force main located on the north side of the proposed building, where stormwater would be pumped into one of two bioretention areas. Treated stormwater from the bioretention areas and untreated runoff from the surface parking lot would be routed into a Contech Stormfilter box located south of the proposed building, and would ultimately discharge into a proposed 36-inch stormwater main in Osage Avenue.

Project Entitlements

The proposed project would require approval of the following entitlements:

- Approval of the Initial Study and Mitigation and Monitoring Plan; and
- Site Plan and Design Review.

SECTION III – ENVIRONMENTAL CHECKLIST AND DISCUSSION

LAND USE, POPULATION AND HOUSING, AGRICULTURAL RESOURCES

Introduction

The California Environmental Quality Act (CEQA) requires the Lead Agency to examine the effects of a project on the physical conditions that exist within the area that would be affected by the project. CEQA also requires a discussion of any inconsistency between the proposed project and applicable general plans and regional plans.

An inconsistency between the proposed project and an adopted plan for land use development in a community would not constitute a physical change in the environment. When a project diverges from an adopted plan, however, it may affect planning in the community regarding infrastructure and services, and the new demands generated by the project may result in later physical changes in response to the project.

In the same manner, the fact that a project brings new people or demand for housing to a community does not, by itself, change the physical conditions. An increase in population may, however, generate changes in retail demand or demand for governmental services, and the demand for housing may generate new activity in residential development. Physical environmental impacts that could result from implementing the proposed project are discussed in the appropriate technical sections.

This section of the Initial Study identifies the applicable land use designations, plans and policies, and permissible densities and intensities of use, and discusses any inconsistencies between these plans and the proposed project. This section also discusses agricultural resources and wildfire, and the effect of the project on these resources.

Discussion

Land Use

The project site is designated Industrial in the 2035 City of Sacramento General Plan, and the project site is zoned Heavy Industrial (M-2(S)-R). The Industrial land use designation allows for industrial or manufacturing uses that may occur within or outside the building. The Heavy Industrial zoning district allows for multi-family residential, commercial, institutional, industrial, and agricultural uses. Warehouses and distribution centers are permitted if the use is located greater than one half mile from the center of an existing or proposed light rail station platform. The proposed project would involve development of a warehouse, and the project site is located over one-half mile from an existing or proposed light rail platform. As a result, the proposed project would be considered consistent with the General Plan land use and zoning designations. Therefore, development of the project site has been previously considered by the City and evaluated in the Master EIR.

The project site is located in a portion of the community that is developed with residential and industrial uses. Surrounding land uses include industrial uses to the north and west, single-family residences to the south, and a junkyard and single-family residences to the east. The site does not contain any existing residential development, and implementation of the project would not physically divide an established community. Development of the site would alter the existing on-site landscape from an empty grass/dirt lot to a warehouse surrounded by parking lots and two bioretention area. However, the development would be consistent with surrounding land uses and with the site's planned use.

Based on the above, the proposed project would not result in impacts related to land use.

Population and Housing

Implementation of the proposed project would not displace any existing housing units or people and, as a result, the construction or replacement of housing elsewhere would not be required for the project. In addition, the proposed project would not include the development of any residential units. Consequently, development would not add to the population of the City. As previously mentioned, the proposed project is consistent with the General Plan land use and zoning designations. As such, impacts related to population and housing associated with buildout of the project site would have been addressed as part of the Master EIR analysis. As a result, the project would not be considered to induce population beyond what was previously analyzed in the Master EIR.

Agricultural Resources

The project site itself is not developed, but the project site is located in a developed area that would not be practical to convert to farmland. According to the California Department of Conservation Important Farmland Map, the project site is classified as Farmland of Local Importance.[1] As such, the project site does not contain soils designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

The Master EIR discussed the potential impact of development under the 2035 General Plan on agricultural resources (see Master EIR, Chapter 4.1). In addition to evaluating the effect of the General Plan on sites within the City, the Master EIR noted that to the extent the Sacramento General Plan accommodates future growth within the City limits, the conversion of farmland outside the City limits is minimized (Master EIR, page 4.1-3). The Master EIR concluded that the impact of the General Plan on agricultural resources within the City was less than significant. Thus, the proposed project would not result in significant environmental effects related to agricultural resources.

Wildfire

Pursuant to the CAL FIRE Fire and Resources Assessment Program (FRAP), the City of Sacramento is located within a Local Responsibility Area (LRA). The project site is not located within or adjacent to a designated Very High Fire Hazard Severity Zone (VHFHSZ).[2] Furthermore, the project site is located within a developed area where a substantial wildland-urban interface does not exist. Thus, the risk of wildfire at the project site is minimal. The Master EIR does not identify any significant impacts related to wildfire risk. Based on the above, the proposed project would not create a substantial fire risk for existing development in the project vicinity. Therefore, the project would not have a significant impact related to Wildfire.

1 California Department of Conservation. *California Important Farmland Finder*. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed August 2021.

2 California Department of Forestry and Fire Protection. *Fire and Resource Assessment Program (FRAP).* Available at: https://frap.fire.ca.gov/. Accessed August 2021.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
1. AESTHETICS Would the proposal: A) Create a new source of glare that would cause a public hazard or annoyance?			X
B) Create a new source of light that would be cast onto oncoming traffic or residential uses?			X
C) Substantially degrade the existing visual character of the site or its surroundings?			X

ENVIRONMENTAL SETTING

The 9.51-acre project site is currently undeveloped, with the exception of a concrete pad on the northern edge of the site and two transmission line towers located on the eastern edge of the site. The associated transmission lines transect the project site diagonally, intersecting the project site's northern and eastern boundaries and travelling above the project site's northeastern corner. Surrounding existing land uses include industrial uses to the north and west, single-family residences to the south, and a junkyard and single-family residences to the east. The project site is generally located within an area of the City featuring large industrial facilities to the west and north and single-family residences on large parcels to the south and east. The site is bound by South Watt Avenue to the west and Osage Avenue to the south.

Public views of the project site include views from motorists, bicyclists, and pedestrians travelling on South Watt Avenue and Osage Avenue. Public views of the project site are not obstructed due to the lack of trees on the project site.

Existing scenic resources in the City include major natural open space features such as the American River and Sacramento River, including associated parkways. In addition, the State Capitol is a scenic resource within the City defined by the Capitol View Protection Ordinance. The project site does not contain any identified scenic resources and is not located within an area designated as a scenic resource or vista. The California Department of Transportation (Caltrans) manages the State Scenic Highway System which provides guidance and assists local government agencies with the process to officially designate scenic highways. According to Caltrans, designated scenic highways are not located in proximity to the project site and the project site is not visible from any State-designated scenic highways.[3]

STANDARDS OF SIGNIFICANCE

The significance criteria used to evaluate the proposed project's potential impacts to aesthetics are based on Appendix G of the CEQA Guidelines, thresholds of significance adopted by the City in applicable general plans and previous environmental documents, and professional judgment. A significant impact related to aesthetics would occur if the project would:

- Substantially interfere with an important scenic resource or substantially degrade the view of an existing scenic resource; or
- Create a new source of substantial light or glare that is substantially greater than typical urban sources and could cause sustained annoyance or hazard for nearby sensitive receptors.

[3] California Department of Transportation. *California Scenic Highway Mapping System, Sacramento County.* Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed August 2021.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR described the existing visual conditions in the City of Sacramento, and the potential changes to those conditions that could result from development consistent with the 2035 General Plan. See Master EIR, Chapter 4.13, Visual Resources.

The Master EIR identified potential impacts for light and glare (Impact 4.13-1) and concluded that impacts would be less than significant.

ANSWERS TO CHECKLIST QUESTIONS

Questions A and B

New development under the Sacramento General Plan could add sources of light that are similar to the existing urban light sources from one of the following: exterior building lighting, new street lighting, parking lot lights, and headlights of vehicular traffic. Potential new sources of light associated with development and operation of the proposed project would be similar to the nearby warehouses and industrial buildings to the north and west of the project site. Sensitive land uses would generally be residential uses, especially single- and multi-family residences. The nearest light-sensitive receptors to the project site are the residences directly east and south of the project site.

Because the City of Sacramento is mostly built-out with a level of ambient light that is typical of and consistent with the urban character of a large city, and new development allowed under the 2035 General Plan would be subject to the General Plan policies, building codes, and (for larger projects) Design Review, the introduction of substantially greater intensity or dispersal of light would not occur. For example, Policy ER 7.1.3, Lighting, requires that misdirected, excessive, or unnecessary outdoor lighting be minimized. In addition, Policy ER 7.1.4, Reflective Glass, prohibits new development from resulting in any of the following:

(1) using reflective glass that exceeds 50 percent of any building surface and on the bottom three floors;
(2) using mirrored glass;
(3) using black glass that exceeds 25 percent of any surface of a building;
(4) using metal building materials that exceed 50 percent of any street-facing surface of a primarily residential building; and
(5) using exposed concrete that exceeds 50 percent of any building.

To avoid the creation of a new source of substantial light or glare that is substantially greater than typical urban sources and could cause sustained annoyance or hazard for nearby sensitive receptors, the General Plan Master EIR also recommends General Plan Policy LU 6.1.12, which requires the following features:

(1) Buildings setback from rear or side yard property lines adjoining single-family residential uses;
(2) Building heights stepped back from sensitive adjoining uses to maintain appropriate transitions in scale and to protect privacy and solar access;
(3) Landscaped off-street parking areas, loading areas, and service areas screened from adjacent residential areas, to the degree feasible; and
(4) Lighting shielded and directed downward to minimize impacts on adjacent residential uses (RDR).

Because the project site is currently undeveloped, development of the site with the proposed project would result in the introduction of new light/reflective sources as compared to the existing conditions. However, the new light sources from the building would be of the same character as surrounding development. Additionally, the proposed development would not cast light onto oncoming traffic. Furthermore, the proposed project would be required to comply with the aforementioned General Plan policies, which would be ensured through the Site Plan and Design Review process. Implementation of all applicable General Plan polices would ensure that the new sources of light/glare do not substantially affect the nearby light-sensitive receptors.

Based on the above, while the proposed project would introduce new sources of light and glare to the project site compared to existing conditions, the type and intensity of light and glare would be similar to that of the surrounding industrial developments. Furthermore, the proposed project would comply with all applicable General Plan policies related to minimizing light and glare, and compliance with such policies would be ensured during the Design Review for the project. Therefore, the proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

Question C

New development associated with the 2035 General Plan could result in changes to important scenic resources as seen from visually sensitive locations. As described above under "Environmental Setting," important existing scenic resources include major natural open space features such as the American River and Sacramento River, including associated parkways. Another important scenic resource is the State Capitol (as defined by the Capitol View Protection Ordinance). Other potential important scenic resources include important historic structures listed on the Sacramento Register of Historic and Cultural Resources, California and/or National Registers.

Visually-sensitive public locations include viewpoints where a change to the visibility of an important scenic resource, or a visual change to the resource itself, would affect the general public. Visually-sensitive public locations include public plazas, trails, parks, parkways, or designated, publicly available and important scenic corridors (e.g., Capitol View Protection Corridor).

The project site is not located near significant visual resources such as the Sacramento River, American River, or the State Capitol.

The 2035 General Plan designates the site Industrial, which permits residential, commercial and institutional, and industrial and agricultural uses. The construction of the proposed project would be consistent with the permitted land use designation for the site and compatible with the existing industrial uses near the site. Because the proposed project is consistent with the General Plan, impacts related to aesthetics have been analyzed and anticipated within the Master EIR. According to the Master EIR, with adherence to policies related to aesthetics, buildout of the General Plan would not substantially alter the existing visual character.

Furthermore, City staff would conduct Site Plan and Design Review prior to implementation of the proposed project. As noted in Chapter 17.808 of the Sacramento City Code, the purpose of Site Plan and Design Review is to ensure that the physical aspects of development projects are consistent with the General Plan and any other applicable specific plans or design guidelines, that projects are high quality and compatible with surrounding development, among other considerations. Accordingly, Site Plan and Design Review for the proposed project would ensure that the proposed development would not result in a substantial degradation in the existing visual character of the project site. Finally, the proposed project would be visually consistent with the surrounding developments, including the adjacent industrial areas to the north and west.

Therefore, potential impacts to the visual character of the project site and its surroundings associated with development of the site with light industrial uses have been previously analyzed in the Master EIR, and the proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Aesthetics.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
2. AIR QUALITY Would the project: A) Result in construction emissions of NO_x above 85 pounds per day?			X
B) Result in operational emissions of NO_x or ROG above 65 pounds per day?			X
C) Violate any air quality standard or have a cumulatively considerable contribution to an existing or projected air quality violation?			X
D) Result in PM_{10} and $PM_{2.5}$ concentrations that exceed SAMQMD requirements?			X
E) Result in CO concentrations that exceed the 1-hour state ambient air quality standard (i.e., 20.0 ppm) or the 8-hour state ambient standard (i.e., 9.0 ppm)?			X
F) Result in exposure of sensitive receptors to substantial pollutant concentrations?			X
G) Result in TAC exposures create a risk of 10 in 1 million for stationary sources, or substantially increase the risk of exposure to TACs from mobile sources?			X
H) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X

ENVIRONMENTAL SETTING

The City of Sacramento is located within the Sacramento Valley Air Basin (SVAB), which is a valley bounded by the North Coast Mountain Ranges to the west and the Northern Sierra Nevada Mountains to the east. The terrain in the valley is flat and approximately 25 feet above sea level. The City, including the project site, is located within the jurisdiction of the Sacramento Air Quality Management District (SMAQMD).

Hot, dry summers and mild, rainy winters characterize the Mediterranean climate of the Sacramento Valley. Throughout the year, daily temperatures may range by 20 degrees Fahrenheit with summer highs often exceeding 100 degrees and winter lows occasionally below freezing. Average annual rainfall is about 20 inches and snowfall is very rare. Summertime temperatures are normally moderated by the presence of the "Delta breeze" that arrives through the Carquinez Strait in the evening hours.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants in the valley. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap cooler air and pollutants near the ground.

The warmer months in the SVAB (May through October) are characterized by stagnant morning air or light winds, and the Delta breeze that arrives in the evening out of the southwest. Usually, the evening breeze transports a portion of airborne pollutants to the north and out of the Sacramento Valley. During about half of the day from July to September, however, a phenomenon called the “Schultz Eddy” prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern to circle back south. This phenomenon exacerbates the pollution levels in the area and increases the likelihood of violating Federal or State standards. The Schultz Eddy normally dissipates around noon when the Delta breeze begins.

Criteria Air Pollutants

Concentrations of emissions from criteria air pollutants (the most prevalent air pollutants known to be harmful to human health) are used to indicate the quality of the ambient air. Criteria air pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead. The sources of criteria air pollutants and their respective acute and chronic health impacts are described in Table 1.

Existing Air Quality

The U.S. Environmental Protection Agency (EPA) has been charged with implementing national air quality programs. EPA’s air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970 and most recently amended by Congress in 1990. The CAA required EPA to establish the National Ambient Air Quality Standards (NAAQS) for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. CAA also requires each state to prepare a State Implementation Plan (SIP) for attaining and maintaining the NAAQS. The federal Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. Individual SIPs are modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies.

The California Air Resources Board (CARB) is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish its own California Ambient Air Quality Standards (CAAQS). CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS.

The SVAB is currently designated as nonattainment for the NAAQS 8-hour ozone standard and the CAAQS for both 1-hour and 8-hour O_3 standard. The SVAB is also currently designated as nonattainment for both NAAQS and CAAQS 24-hour PM_{10} standards. In addition, the SVAB is currently designated as nonattainment for the NAAQS 24-hour $PM_{2.5}$ standard. The air basin is designated as unclassified or in attainment for the remaining criteria air pollutants (SMAQMD 2019).

Toxic Air Contaminants

According to the California Almanac of Emissions and Air Quality (CARB 2013), the majority of the estimated health risks from toxic air contaminants (TACs) can be attributed to relatively few compounds, the most important being diesel particulate matter (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Table 1
Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from reaction of ROG and NO_X in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	Headache, dizziness, fatigue, nausea, vomiting, death	Permanent heart and brain damage
Nitrogen dioxide (NO_2)	Combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	Coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	Chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	Coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the Atmosphere by condensation and/or transformation of SO_2 and ROG	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	Alterations to the immune system, carcinogenesis
Lead	Metal processing	Reproductive/developmental effects (fetuses and children)	Numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.
1. "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.
2. "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.

Source: EPA 2018.

Sensitive Receptors

Sensitive receptors are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, such as children or the elderly. Residential dwellings, schools, hospitals, playgrounds, and similar facilities are of primary concern because of the presence of individuals particularly sensitive to pollutants and/or the potential for increased and prolonged exposure of individuals to pollutants. Sensitive receptors in the vicinity of the project site include scattered single-family residences to the east and south of the site, with the nearest sensitive receptor located approximately 80 feet south of the project site, across Osage Avenue.

Greenhouse Gases

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. GHGs are responsible for "trapping" solar radiation in the earth's atmosphere, a phenomenon known as the greenhouse effect. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. Emissions of GHGs contributing to global climate change are attributable, in large part, to human activities associated with on-road and off-road transportation, industrial/manufacturing, electricity generation by utilities and consumption by end users, residential and commercial on-site fuel usage, and agriculture and forestry. Emissions of CO_2 are, largely, byproducts of fossil fuel combustion.

The quantity of GHGs in the atmosphere responsible for climate change is not precisely known, but it is enormous. No single project alone would measurably contribute to an incremental change in the global average temperature or to global or local climates or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

Several regulations currently exist related to GHG emissions, predominantly Assembly Bill (AB) 32, Executive Order S-3-05, and Senate Bill (SB) 32. AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. Executive Order S-3-05 established the GHG emission reduction target for the State to reduce to the 2000 level by 2010, the 1990 level by 2020 (AB 32), 40 percent below the 1990 level by 2030, and to 80 percent below the 1990 level by 2050 (SB 32).

To meet the statewide GHG emission targets, the City adopted the City of Sacramento Climate Action Plan (CAP) on February 14, 2012 to comply with AB 32. The CAP identified how the City and the broader community could reduce Sacramento's GHG emissions and included reduction targets, strategies, and specific actions. In 2015, the City of Sacramento adopted the 2035 General Plan Update. The update incorporated measures and actions from the CAP into Appendix B, General Plan CAP Policies and Programs, which includes citywide policies and programs that are supportive of reducing GHG emissions, consistent with the goals of AB 32 and SB 32. It is noted that the City is in the process of adopting a Climate Action and Adaptation Plan (CAAP) that will meet the criteria for a qualified GHG reduction plan. The CAAP has not yet been adopted.

STANDARDS OF SIGNIFICANCE

For purposes of this Initial Study, air quality impacts may be considered significant if construction and/or implementation of the proposed project would result in the following impacts that remain significant after implementation of 2035 General Plan policies:

- Construction emissions of NO_X above 85 pounds per day;
- Operational emissions of NO_X or ROG above 65 pounds per day;
- Violation of any air quality standard or contribute substantially to an existing or projected air quality violation;
- Any increase in PM_{10} concentrations, unless all feasible Best Available Control Technology (BACT) and Best Management Practices (BMPs) have been applied, then increases above 80 pounds per day or 14.6 tons per year;
- CO concentrations that exceed the 1-hour State ambient air quality standard (i.e., 20.0 parts per million [ppm]) or the 8-hour State ambient standard (i.e., 9.0 ppm); or
- Exposure of sensitive receptors to substantial pollutant concentrations.

Ambient air quality standards have not been established for TACs. TAC exposure is deemed to be significant if:

- TAC exposures create a risk of 10 in 1 million for stationary sources, or substantially increase the risk of exposure to TACs from mobile sources.

A project is considered to have a significant effect relating to GHG emissions if the project fails to satisfy the requirements of the City's CAP.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR addressed the potential effects of the 2035 General Plan on ambient air quality and the potential for exposure of people, especially sensitive receptors such as children or the elderly, to unhealthful pollutant concentrations. See Master EIR, Chapter 4.2.

Policies in the 2035 General Plan Environmental Resources Element were identified as mitigating potential effects of development that could occur under the 2035 General Plan. For example, Policy ER 6.1.1 calls for the City to work with the CARB and the SMAQMD to meet State and federal air quality standards; Policy ER 6.1.2 requires the City to review proposed development projects to ensure that the projects incorporate feasible measures that reduce construction and operational emissions; Policy ER 6.1.4 and ER 6.1.11 calls for coordination of City efforts with SMAQMD; and Policy ER 6.1.15 requires the City to give preference to contractors using reduced-emission equipment.

The Master EIR identified exposure to sources of TACs as a potential effect. Policies in the 2035 General Plan would reduce the effect to a less-than-significant level. The policies include ER 6.1.4, requiring coordination with SMAQMD in evaluating exposure of sensitive receptors to TACs, and impose appropriate conditions on projects to protect public health and safety, as well as Policy LU 2.7.5 requiring extensive landscaping and trees along freeways and design elements that provide proper filtering, ventilation, and exhaust of vehicle air emissions from buildings.

The Master EIR found that GHG emissions that would be generated by development consistent with the 2035 General Plan would contribute to climate change on a cumulative basis. Policies of the 2035 General Plan identified in the Master EIR that would reduce construction related GHG emissions include: ER 6.1.2, ER 6.1.11 requiring coordination with SMAQMD to ensure feasible mitigation measures are incorporated to reduce GHG emissions, and ER 6.1.15. The 2035 General Plan incorporates the GHG reduction strategy of the 2012 CAP, which demonstrates compliance mechanism for achieving the City's adopted GHG reduction target of 15 percent below 2005 emissions by 2020. Policy ER 6.1.8 commits the City to assess and monitor performance of GHG emission reduction efforts beyond 2020, and progress toward meeting long-term GHG emission reduction goals, ER 6.1.9 also commits the City to evaluate the feasibility and effectiveness of new GHG emissions reduction measures in view of the City's longer-term GHG emission reductions goal. The discussion of greenhouse gas emissions and climate change in the 2035 General Plan Master EIR are incorporated by reference in this Initial Study (CEQA Guidelines Section 15150).

The Master EIR identified numerous policies included in the 2035 General Plan that addressed greenhouse gas emissions and climate change. See Draft Master EIR, Chapter 4.14, and pages 4.14-1 et seq.

ANSWERS TO CHECKLIST QUESTIONS

Questions A through D

Implementation of the proposed project would contribute local emissions in the area during both construction and operations of the proposed project. In order to evaluate ozone and other criteria air pollutant emissions and support attainment goals for those pollutants that the area is designated nonattainment, the SMAQMD has established recommended thresholds of significance, including mass emission thresholds for construction-related and operational ozone precursors, as the area is under nonattainment for ozone. The SMAQMD's recommended thresholds of significance for the ozone precursors reactive organic gases (ROG) and nitrous oxides (NO_X), PM_{10}, and $PM_{2.5}$, which are expressed in pounds per day (lbs/day), are presented in Table 2.

Table 2
SMAQMD Thresholds of Significance (lbs/day)

Pollutant	Construction Thresholds	Operational Thresholds
NO_X	85	65
ROG	-	65
PM_{10}	Zero (0). If all feasible BACT/BMPs are applied, then: 80 lbs/day and 14.6 tons/yr	Zero (0). If all feasible BACT/BMPs are applied, then: 80 lbs/day and 14.6 tons/yr
$PM_{2.5}$	Zero (0). If all feasible BACT/BMPs are applied, then: 82 lbs/day and 15 tons/yr	Zero (0). If all feasible BACT/BMPs are applied, then: 82 lbs/day and 15 tons/yr

Notes: BACT = Best Available Control Technologies; BMP = Best Management Practices.

Source: Sacramento Metropolitan Air Quality Management District. SMAQMD Thresholds of Significance Table. Available at: http://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable4-2020.pdf. Accessed April 2022.

Because construction equipment emits relatively low levels of ROG, and ROG emissions from other construction processes (e.g., asphalt paving, architectural coatings) are typically regulated by SMAQMD, SMAQMD has not adopted a construction emissions threshold for ROG. SMAQMD has, however, adopted a construction emissions threshold for NO_X, as shown in Table 2, above.

In order to determine whether the proposed project would result in criteria pollutant emissions in excess of the applicable thresholds of significance presented above, the proposed project's emissions have been estimated using the California Emissions Estimator Model (CalEEMod) version 2020.4.0 software – a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the Institute of Transportation Engineers (ITE) Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data is available, such data should be input into the model. Accordingly, based on information provided by the project applicant, the proposed project's modeling assumed the following:

- Construction would begin in May 2022;
- Construction would occur over an approximately 8-month period;
- A 21,846-sf concrete pad would be demolished as part of project construction;
- During project operations, three 89 horsepower diesel forklifts would operate for eight hours per day, 260 days per year;
- The proposed project would generate 5.24 trips per 1,000 sf of warehouse; and
- The proposed project would comply with all relevant provisions of the Model Water Efficient Landscape Ordinance (MWELO).

The results of the proposed project's emissions estimates were compared to the thresholds of significance above in order to determine the associated level of impact. All CalEEMod modeling results are included as Appendix A to this Initial Study.

Construction Emissions

During construction of the proposed project, which includes demolition of the existing on-site concrete pad, various types of equipment and vehicles would operate on the project site. Construction exhaust emissions would be generated from construction equipment, any earth-moving activities, construction workers' commute, and material hauling for the entire construction period. These activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants.

According to the CalEEMod results, the proposed project is estimated to result in maximum daily construction emissions as shown in Table 3.

Table 3 Maximum Unmitigated Project Construction Emissions		
Pollutant	**Project Emissions (lbs/day)**	**SMAQMD Threshold of Significance (lbs/day)**
NO_X	33.12	85
PM_{10}	21.41	80
$PM_{2.5}$	11.62	82
Source: CalEEMod, January 2022 (see Appendix A).		

As shown in the table, the proposed project's maximum unmitigated construction-related emissions would be below the applicable thresholds of significance. As noted previously, to apply the PM_{10} and $PM_{2.5}$ thresholds of significance, projects must implement all feasible SMAQMD BACTs and BMPs related to dust control. In the case of construction activities, projects are required to implement the SMAQMD's identified Basic Construction Emissions Control Practices (BCECPs), which are considered by the SMAQMD to be the applicable construction BMPs. The control of fugitive dust during construction is required by SMAQMD Rule 403, and enforced by SMAQMD staff. Therefore, the non-zero thresholds of significance for PM are applicable.

In addition, all projects under the jurisdiction of SMAQMD are required to comply with all applicable SMAQMD rules and regulations (a complete list of current rules is available at www.airquality.org/rules). Rules and regulations related to construction include, but not limited to, Rule 201 (General Permit Requirements), Rule 402 (Nuisance), Rule 403 (Fugitive Dust), Rule 404 (Particulate Matter), Rule 414 (Water Heaters, Boilers and Process Heaters Rated Less Than 1,000,000 British Thermal Units per Hour), Rule 417 (Wood Burning Appliances), Rule 442 (Architectural Coatings), Rule 453 (Cutback and Emulsified Asphalt Paving Materials), Rule 460 (Adhesives and Sealants), Rule 902 (Asbestos) and CCR requirements related to the registration of portable equipment and anti-idling. Furthermore, all projects are required to implement the SMAQMD's BCECP. Compliance with SMAQMD rules, regulations, and BCECP would ensure that construction emissions are minimized to the extent practicable, and would reduce emissions below the level presented in Table 3. Therefore, impacts related to the proposed project's construction emissions of criteria pollutants would be less than significant.

Operational Emissions

Operation of the proposed project would result in various sources of emissions including emissions related to natural gas combustion for heating mechanisms, landscape maintenance equipment exhaust, consumer products (e.g., cleaning products, spray paint), and mobile sources. Emissions from mobile sources, such as future employee vehicle trips to and from the project site, would make up the majority of the emissions related to project operations. The proposed project's estimated operational emissions are presented in Table 4.

Table 4 Maximum Unmitigated Project Operational Emissions		
Pollutant	**Project Emissions (lbs/day)**	**SMAQMD Threshold of Significance (lbs/day)**
NO_X	6.00	65
ROG	6.17	65
PM_{10}	4.52	80
$PM_{2.5}$	1.34	82
Source: CalEEMod, January 2022 (see Appendix A).		

As shown in the table, the proposed project's maximum unmitigated operational emissions or criteria pollutants would be below the applicable thresholds of significance. It should be noted that the project would not involve installation or operation of any pieces of equipment that would require implementation of SMAQMD's BACTs; therefore, the project would be subject to SMAQMD's mass emissions thresholds for PM_{10} and $PM_{2.5}$. As a result, impacts related to operational emissions of criteria pollutants would be considered less than significant.

Cumulative Emissions

Due to the dispersive nature and regional sourcing of air pollutants, air pollution is already largely a cumulative impact. The non-attainment status of regional pollutants, including ozone and PM, is a result of past and present development, and, thus, cumulative impacts related to these pollutants could be considered cumulatively significant. SMAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. As future attainment of AAQS is a function of successful implementation of SMAQMD's planning efforts, according to the SMAQMD Guide, by exceeding the SMAQMD's project-level thresholds for construction or operational emissions, a project could contribute to the region's nonattainment status for ozone and PM emissions and could be considered to conflict with or obstruct implementation of the SMAQMD's air quality planning efforts. Consequently, the SMAQMD Guide states that SMAQMD's approach to thresholds of significance is key to determining whether a project's individual emissions would result in a cumulatively considerable adverse contribution to the SVAB's existing air quality conditions. If a project's emissions are estimated to be less than the thresholds, the project would not be expected to result in a cumulatively considerable contribution to the significant cumulative impact.

As discussed above, the proposed project would result in construction and operational emissions below all applicable SMAQMD thresholds of significance. Therefore, the proposed project would not be considered to contribute to the region's nonattainment status for ozone or PM emissions and would not conflict with or obstruct implementation of the SMAQMD's air quality planning efforts. Accordingly, the proposed project would not be considered to result in a new cumulatively considerable net increase of a criteria pollutant for which the project region is non-attainment beyond what has been previously anticipated for the project site by the County.

Conclusion

As discussed above, the proposed project would not result in construction or operational emissions in excess of the applicable thresholds of significance. Thus, the proposed project would not violate any AAQS, contribute substantially to an existing or projected air quality violation, or result in PM concentrations greater than the applicable thresholds. Therefore, the proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

<u>Question E</u>

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Per the SMAQMD Guide, emissions of CO are generally of less concern than other criteria pollutants, as operational activities are not likely to generate substantial quantities of CO, and the SVAB has been in attainment for CO for multiple years.[4] The use of construction equipment at the project site would result in limited generation of CO; however, the total amount of CO emitted by construction equipment would be minimal and would not have the potential to result in health risks to any nearby receptors. Similarly, while the proposed project would result in an increase in vehicle trips and truck trips travelling to and from the project site, the amount of CO emitted by such vehicles and trucks would be limited, and, thus, would not be anticipated to result in health risks to any nearby receptors. Consequently, the proposed project would have ***no additional significant environmental effects*** related to localized CO emissions beyond what was previously evaluated in the Master EIR.

<u>Question F and G</u>

The area surrounding the project site is currently developed with industrial uses to the north and west, a junkyard to the east, and single-family residences to the south and east. The existing single-family

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4 Sacramento Metropolitan Air Quality Management District. *Guide to Air Quality Assessment, Chapter 4: Operational Criteria Air Pollutant and Precursor Emissions*. June 2020.

residences would be considered sensitive receptors, with the closest located approximately 80 feet south of the project site boundary.

TAC Emissions

Another category of environmental concern is TACs. The CARB *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, gasoline dispensing facilities, chrome plating operations, distribution centers, and rail yards. The CARB has identified diesel PM from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from diesel PM. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk.

The project site is not located in an area identified as likely to contain natural-occurring asbestos, which has been identified as a TAC. In addition, stationary sources of TACs (i.e., diesel generators) are not proposed to be included as part of the project. Thus, sensitive receptors would not be exposed to TACs associated with naturally-occurring asbestos or stationary sources as a result of the proposed project.

The proposed project would involve components that would result in emissions of TACs. In particular, implementation of the proposed project would result in emissions related to project construction, and the use of heavy-duty diesel trucks to transport goods to and from the site. Each source of TACs is discussed in further depth below.

Construction Equipment

Short-term, construction-related activities would result in the generation of TACs, specifically diesel PM, from on-road haul trucks and off-road equipment exhaust emissions. However, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Specifically, per project-specific information provided by the project applicant, construction would occur over an approximately 8-month period. The exposure period typically analyzed in health risk assessments is 30 years or greater, which is substantially longer than the 8-month construction period associated with the proposed project. In addition, only portions of the site would be disturbed at a time, with operation of construction equipment regulated by federal, State, and local regulations, including SMAQMD rules and regulations, and occurring intermittently throughout the course of a day. Considering the short-term nature of construction activities, the regulated and intermittent nature of the operation of construction equipment, and the highly dispersive nature of diesel PM, the likelihood that any one sensitive receptor would be exposed to high concentrations of diesel PM for any extended period of time would be low. For the aforementioned reasons, project construction would not be expected to expose sensitive receptors to substantial pollutant concentrations.

Heavy-Duty Trucks

The proposed project would consist of the development of a 115,468-sf warehouse building, which would involve the use of heavy-duty diesel trucks during project operations. The CARB Handbook includes distribution centers involving heavy-duty diesel truck traffic of more than 100 trucks per day as a source of substantial TAC emissions. According to the Focused Transportation Analysis prepared for the proposed project, the project would generate 62 heavy-duty diesel truck trips daily. Because the proposed project would not involve more than 100 heavy-duty diesel truck trips per day, pursuant to the CARB Handbook, operation of the project would not generate substantial TAC emissions requiring further study. In addition, it should be noted that Sections 2449 and 2485 of Title 13 of the CCR limits idling of heavy-duty trucks to five minutes. Unless specifically exempted in Sections 2449 and 2485, all diesel-powered equipment and heavy-duty trucks associated with the proposed project would be subject to such idling limitations. Furthermore, the prevailing wind direction in the project area is towards the north;[5] therefore, any emissions of TACs produced by the proposed project would typically be blown away from the nearest sensitive receptors, which are located to the south and east. As such, the proposed project would not expose sensitive receptors to substantial pollutant concentrations during operations.

Conclusion

As discussed above, the proposed project would not result in the exposure of sensitive receptors to substantial pollutant concentrations, or substantially increase the risk of exposure to TACs from mobile sources. Therefore, the proposed project would have ***no additional significant environmental effects*** beyond what was previously evaluated in the Master EIR.

<u>Question H</u>

Emissions from operations of the proposed project were quantified and would equal approximately 960.47 metric tons of CO_2 equivalent units per year, which is below the SMAQMD threshold of 1,100 metric tons of CO2 equivalent units per year. However, the City of Sacramento does not assess potential impacts related to GHG emissions on the basis of total emissions of GHGs. Rather, the City of Sacramento has integrated a CAP into the City's General Plan, and, thus, potential impacts related to climate change from development within the City are assessed based on the project's compliance with the City's adopted General Plan CAP Policies and Programs set forth in Appendix B of the General Plan Update. The majority of the policies and programs set forth in Appendix B are citywide efforts in support of reducing overall citywide emissions of GHG and are not applicable to individual development projects. However, various policies related to new development within the City would directly apply to the proposed project. The project's general consistency with City policies that would reduce GHG emissions from buildout of the City's General Plan is discussed below.

Goal LU 1.1 and Policy LU 1.1.5 encourage infill development within existing urbanized areas. Given that the proposed project would be consistent with the site's current land use and zoning designations and the areas to the west and north of the project site are currently built-out with industrial uses, the project would be consistent with Goal LU 1.1 and Policy LU 1.1.5. The proposed project would be constructed in compliance with the California Building Standards Code (CBSC), which includes the California Building Energy Efficiency Standards and the California Green Building Code. The CBSC, and the foregoing standards and codes, increase the sustainability of new development through requiring energy efficiency and sustainable design practices (Policy ER 6.1.7). Such sustainable design would support the City's Policy U 6.1.5, which states that energy consumption per capita should be reduced as compared to the year 2005.

Goal LU 2.5, Policy LU 2.5.1, and Policy LU 2.7.6 require that new urban developments should be well-connected, minimize barriers between uses, and create pedestrian-scaled, walkable areas. Considering the industrial nature of the proposed project, such policies do not specifically apply to the project as industrial warehouses are not pedestrian-generating uses. Nonetheless, the proposed project would include on- and off-site pedestrian connections to the existing sidewalks along South Watt Avenue. Therefore, the proposed project would comply with the aforementioned goals and policies.

The Master EIR concluded that buildout of the City's General Plan, including the project site, would not result in a conflict with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. The proposed project would be consistent with the City's General Plan land use and zoning designations for the site as well as the policies discussed above that are intended to reduce GHG emissions from buildout of the City's General Plan. Thus, GHG emissions from operation of the proposed project were previously analyzed in the Master EIR, and would be consistent with the CAP. Considering the project's consistency with the City's General Plan, including the CAP, and the general consistency with the City's General Plan policies intended to reduce GHG emissions, the foregoing annual emissions related to operations of the proposed

[5] WeatherSpark. *Climate and Average Weather Year Round in Sacramento*. Available at: https://weatherspark.com/y/1157/Average-Weather-in-Sacramento-California-United-States-Year-Round. Accessed January 2022.

project have been previously analyzed. Consequently, the proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None Required.

FINDINGS

The proposed project would not result in any new project-specific significant environmental effects related to Air Quality.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environment al effect
3. BIOLOGICAL RESOURCES Would the project: A) Create a potential health hazard, or use, production or disposal of materials that would pose a hazard to plant or animal populations in the area affected?			X
B) Result in substantial degradation of the quality of the environment, reduction of the habitat, reduction of population below self-sustaining levels of threatened or endangered species of plant or animal species?		X	
C) Affect other species of special concern to agencies or natural resource organizations (such as regulatory waters and wetlands)?			X

ENVIRONMENTAL SETTING

Prior to human development, the natural habitats within the region included perennial grasslands, riparian woodlands, oak woodlands, and a variety of wetlands including vernal pools, seasonal wetlands, freshwater marshes, ponds, streams, and rivers. Over the last 150 years, agriculture, irrigation, flood control, and urbanization have resulted in the loss or alteration of much of the natural habitat within the City limits. Non-native annual grasses have replaced the native perennial grasslands, many of the natural streams have been channelized, much of the riparian and oak woodlands have been cleared, and most of the marshes have been drained and converted to agricultural or urban uses.

Though the majority of the City is developed with residential, commercial, and other urban development, valuable plant and wildlife habitat still exists. The natural habitats are located primarily outside the City boundaries in the northern, southern and eastern portions of the City, but also occur along river and stream corridors and on a number of undeveloped parcels. Habitats that are present in the City include annual grasslands, riparian woodlands, oak woodlands, riverine, ponds, freshwater marshes, seasonal wetlands, and vernal pools.

The project site is flat and includes ruderal grasses. Morrison Creek, a highly-channelized waterway which eventually flows into the Sacramento River, runs approximately 500 feet south of the project site, roughly parallel to Osage Avenue.

Special-Status Species

Special-status species are plants and animals in the following categories:

- Listed or proposed for listing as threatened or endangered under federal Endangered Species Act (ESA) or candidates for possible future listing;
- Listed or candidates for listing by the state of California as threatened or endangered under the California Endangered Species Act (CESA);
- Listed as Fully Protected under the California Fish and Game Code;
- Animals identified by the California Department of Fish and Wildlife (CDFW) as species of special concern;

- Taxa considered by CDFW to be “rare, threatened, or endangered in California” and assigned a California Rare Plant Rank (CRPR). The CDFW system includes five rarity and endangerment ranks for categorizing plant species of concern, which are summarized as follows:
    - CRPR 1A Plants presumed to be extinct in California;
    - CRPR 1B Plants that are rare, threatened, or endangered in California and elsewhere;
    - CRPR 2 Plants that are rare, threatened, or endangered in California but more common elsewhere;
    - CRPR 3 Plants about which more information is needed (a review list); and
    - CRPR 4 Plants of limited distribution (a watch list).

A locally significant species is a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA Section 15125[c]) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G); or otherwise meets the definition of rare or endangered under CEQA Sections 15380(b) and (d).

Vegetation

The project site is currently covered with ruderal grasses, with the exception of a small concrete pad and two transmission line towers. Vegetation at the site is limited to grasses and small shrubs. Trees are not located on the project site.

Wildlife

Due to the limited diversity of habitat types existing on the property site, the potential for a diversified amount of wildlife is anticipated to be low; however, several trees in the immediate vicinity of the project site and the riparian corridor of Morrison Creek could potentially provide nesting habitat for bird species and other raptors.

Trees

Chapter 12.56, Tree Planting, Maintenance, and Conservation, of the Sacramento City Code establishes guidelines for the conversation, protection, removal, and replacement of both City trees and private protected trees. Per Section 12.56.020, a private protected tree meets at least one of the following criteria:

A. A tree that is designated by City Council resolution to have special historical value, special environmental value, or significant community benefit, and is located on private property;
B. Any native Valley Oak (*Quercus lobata*), Blue Oak (*Quercus douglasii*), Interior Live Oak (*Quercus wislizenii)*, Coast Live Oak (*Quercus agrifolia*), California Buckeye (*Aesculus californica*), or California Sycamore (*Platanus racemosa*), that has a diameter at standard height (DSH) of 12 inches or more, and is located on private property;
C. A tree that has a DSH of 24 inches or more located on private property that:
    a. Is an undeveloped lot; or
    b. Does not include any single unit or duplex dwellings; or
D. A tree that has a DSH of 32 inches or more located on private property that includes any single unit or duplex dwellings.

As previously stated, trees are not located on the project site.

Jurisdictional Waters

The U.S. Army Corps of Engineers (USACE) has regulatory authority of “waters of the U.S.,” which include wetlands, pursuant to Section 404 of the Clean Water Act (CWA). Waters of the U.S. includes navigable waters, interstate waters, and all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Aquatic resources do not exist on the project site.

STANDARDS OF SIGNIFICANCE

For purposes of this environmental document, an impact would be significant if any of the following conditions or potential thereof, would result with implementation of the proposed project:

- Creation of a potential health hazard, or use, production or disposal of materials that would pose a hazard to plant or animal populations in the area affected;
- Substantial degradation of the quality of the environment, reduction of the habitat, reduction of population below self-sustaining levels of threatened or endangered species of plant or animal; or
- Affect other species of special concern to agencies or natural resource organizations (such as regulatory waters and wetlands).

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Chapter 4.3 of the Master EIR evaluated the effects of the 2035 General Plan on biological resources within the City. The Master EIR identified potential impacts in terms of degradation of the quality of the environment or reduction of habitat or population below self-sustaining levels of special-status birds, through the loss of both nesting and foraging habitat.

Policies in the 2035 General Plan were identified as mitigating the effects of development that could occur under the provisions of the 2035 General Plan. Policy ER 2.1.5 calls for the City to preserve the ecological integrity of creek corridors and other riparian resources; Policy ER 2.1.10 requires the City to consider the potential impact on sensitive plants for each project and to require pre-construction surveys when appropriate; and Policy ER 2.1.11 requires the City to coordinate its actions with those of the CDFW, U.S. Fish and Wildlife Service (USFWS), and other agencies in the protection of resources.

The Master EIR discussed biological resources in Chapter 4.3. The Master EIR concluded that policies in the General Plan, combined with compliance with the CESA, CEQA would minimize the impacts on special-status species to a less-than-significant level (see Impact 4.3-1), and that the General Plan policies, along with similar compliance with local, state and federal regulation would reduce impacts to a less-than-significant level for habitat for special-status invertebrates, birds, amphibians and reptiles, mammals and fish (Impacts 4.3-3 through 4.3-6).

Given the prevalence of rivers and streams in the incorporated area, impacts to riparian habitat is a common concern. Riparian habitats are known to exist throughout the City, especially along the Sacramento and American rivers and their tributaries. The Master EIR discussed impacts of development adjacent to riparian habitat that could disturb wildlife species that rely on these areas for shelter and food, and could also result in the degradation of these areas through the introduction of feral animals and contaminants that are typical of urban uses. The CDFW regulates potential impacts on lakes, streams, and associated riparian (streamside or lakeside) vegetation through the issuance of Lake or Streambed Alteration Agreements (SAA) (per Fish and Game Code Section 1602), and provides guidance to the City as a resource agency. While there are no federal regulations that specifically mandate the protection of riparian vegetation, federal regulations set forth in Section 404 of the Clean Water Act address areas that potentially contain riparian-type vegetation, such as wetlands.

The General Plan calls for the City to preserve the ecological integrity of creek corridors, canals and drainage ditches that support riparian resources (Policy ER 2.1.5) and wetlands (Policy ER 2.1.6) and requires habitat assessments and impact compensation for projects (Policy ER 2.1.10). has adopted a standard that requires coordination with State and federal agencies if a project has the potential to affect other species of special concern or habitats (including regulatory waters and wetlands) protected by agencies or natural resource organizations (Policy 2.1.11).

Implementation of 2035 General Plan Policy ER 2.1.5 would reduce the magnitude of potential impacts by requiring a 1:1 replacement of riparian habitat lost to development. While this would help mitigate impacts on riparian habitat, large open areas of riparian habitat used by wildlife could be lost and/or degraded directly and indirectly through development under the 2035 General Plan. Given the extent of urban development designated in the General Plan, the preservation and/or restoration of riparian habitat would likely occur outside of the City limits. The Master EIR concluded that the permanent loss of riparian habitat would be a less-than-significant impact. (Impact 4.3-7)

ANSWERS TO CHECKLIST QUESTIONS

Question A

The use, handling, and storage of hazardous materials is regulated by both the Federal Occupational Safety and Health Administration (Fed/OSHA) and the California Occupational Safety and Health Administration (Cal/OSHA). Cal/OSHA is responsible for developing and enforcing workplace safety regulations. At the local level, the Sacramento County Environmental Management Department regulates hazardous materials within Sacramento County, including chemical storage containers, businesses that use hazardous materials, and hazardous waste management.

Operations associated with the proposed project would be typical of other warehouses in the City, and would be governed by the uses permitted for the site per the City's Municipal Code and General Plan. The project site is designated Industrial by the 2035 General Plan and zoned M-2(S)-R. The M-2(S)-R zoning designation allows for residential uses, commercial and institutional uses, industrial and agricultural uses. Warehouses are permitted if the use is located greater than one half mile from the center of an existing or proposed light rail station platform. The nearest light rail station platform to the project site is the Sacramento Regional Transit District's Watt/Manlove Station, approximately two miles north of the project site. As a result, the proposed project would be allowed under the current zoning and land use designation. Given that development of industrial/warehouse uses has been approved for the project site, impacts associated with such development, including risks to plans or animals, has been previously evaluated in the Master EIR.

The future tenant of the proposed warehouse is unknown at this time; however, it is noted that warehouses are not typically associated with the use, production, or disposal of hazardous materials. The use and storage of hazardous materials is regulated by Chapter 8.64 of the Municipal Code. Section 8.64.040 establishes regulation related to the designation of hazardous materials and requires that a hazardous material disclosure form be submitted within 15 days by any person using or handling a hazardous material. In addition, the routine transport, use, and disposal of hazardous materials are regulated by existing federal, State, and local regulations. For instance, the Sacramento County Environmental Management Department requires businesses handling sufficient quantities of hazardous materials to submit a Hazardous Materials Business Plan and obtain permitting. As the proposed project would be required to comply with all applicable federal, State, and local regulations, the proposed project would not pose a hazard to plant or animal populations in the area.

Based on the above, given that the proposed project is consistent with the land use and zoning designations for the site and would be required to comply with Chapter 8.64 of the City's Municipal Code, the proposed project would have ***no additional significant environmental effect*** related to potential health hazards to plants or animals beyond what was previously evaluated in the Master EIR.

Question B

The proposed project would include development of the 9.51-acre project site with a 115,468-sf warehouse building, one bioretention area, and landscaping features.

A search of the California Natural Diversity Database (CNDDB) was performed for the project site quadrangle (Carmichael) as well as the eight surrounding quadrangles (i.e., Rio Linda, Citrus Heights, Folsom, Buffalo Creek, Sloughhouse, Elk Grove, Florin, Sacramento East) to determine which special-status plant and wildlife species are known to occur within the region. The results of the CNDDB query are discussed below.

Special Status Plant Species

Of the 13 special-status plant species identified as having the potential to exist within the area, all were eliminated from further consideration due to habitat requirements (i.e. aquatic, marsh, swamp, wetland, vernal pool) which are not present at the project site. The grasses on the project site appear to be regularly disced. This regular disturbance likely prevents any special-status plant species from becoming established in the field. Due to the lack of sufficient on-site habitat and the disturbed nature of the site, special-status plants are not likely to occur on-site.

Special-Status Wildlife Species

Of the 23 special-status wildlife species identified as having the potential to exist with the area, all were eliminated from consideration due to habitat requirements (i.e. aquatic, marsh, swamp, wetland, vernal, pool, chaparral, coastal scrub, coastal prairie, estuary, riparian, forest, flowing waters). As previously noted, the project site appears to be regularly disturbed. While trees are not located on the project site, the site could provide ground nesting habitat for burrowing owls.

The project site could also provide foraging habitat for special-status bird species, including migratory birds and raptors protected under the California Fish and Game Code Section 3503 and the federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 16 of U.S. Code [U.S.C.] Sections 703-711). Special-status birds have the potential to nest or perch in trees in the vicinity of the project site, could be disturbed by construction activities should construction occur during the bird nesting season. As such, construction of the project could affect suitable foraging habitat, and a potentially significant impact to migratory birds and raptors protected by the MBTA, including the Swainson's hawk, could occur.

Conclusion

Based on the above, development of the proposed project could result in a potentially significant impact to the burrowing owl and other nesting or migratory birds protected by the MBTA, including Swainson's hawk. However, with the implementation of Mitigation Measure 3-1, the ***effect can be mitigated to less than significant***.

<u>Question C</u>

Currently, the project site is an undeveloped grass/dirt field, and land uses surrounding the site include industrial areas and single-family residences. According to the National Wetlands Inventory (NWI), wetlands do not exist on the project site.[6] The nearest wetlands exist along the Morrison Creek riparian corridor, approximately 500 feet south of the project site. However, implementation of the project would not impinge upon the riparian habitat associated with Morrison Creek.

Because the project site does not contain existing water body features such as rivers, creeks, or natural ditches, the proposed project would not have a substantially adverse effect on any sensitive protected wetlands. Therefore, the proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

Implementation of Mitigation Measure 3-1 below would reduce the impact identified above related to the burrowing owl and other migratory birds and raptors protected under the MBTA, including Swainson's hawk, a *less-than-significant* level.

[6] U.S. Fish and Wildlife Service. *National Wetlands Inventory.* Available at: https://www.fws.gov/wetlands/data/Mapper.html. Accessed August 2021.

3-1 **Swainson's Hawk, Burrowing Owl, and Other Migratory Birds and Raptors Protected Under the MBTA**

If construction activities on the project site are to begin during the nesting season for raptors or other protected bird species in the region (generally February 15-September 15), a qualified biologist shall be retained by the project applicant to conduct pre-construction surveys in areas of suitable nesting habitat for common raptors (including Swainson's hawk) and other bird species protected by the MBTA or California Fish and Game Code located within 500 feet of project activity. Surveys shall be conducted no more than 10 days before ground disturbance is expected to occur. The pre-construction surveys shall be submitted to the City's Community Development Department. If active nests are not found, further mitigation is not required. If active nests are found, the construction contractor shall avoid impacts on such nests by establishing a no-disturbance buffer around the nest. The appropriate buffer size for all nesting birds shall be determined by a qualified biologist, but shall extend at least 50 feet from the nest. Buffer size would vary depending on site-specific conditions, the species of nesting bird, nature of the project activity, the extent of existing disturbance in the area, visibility of the disturbance from the nest site, and other relevant circumstances.

Construction activity shall not occur within the buffer area of an active nest until a qualified biologist confirms that the chicks have fledged and are no longer dependent on the nest, or the nesting cycle has otherwise completed. Monitoring of the nest by a qualified biologist during construction activities shall be required if the activity has the potential to adversely affect the nest. The qualified biologist shall determine the status of the nest at least weekly during the nesting season. If construction activities cause the nesting bird to vocalize, make defensive flights at intruders, get up from a brooding position, or fly off the nest, then the no-disturbance shall be increased until the agitated behavior ceases.

FINDINGS

All additional significant environmental effects of the project relating to Biological Resources can be mitigated to a less-than-significant level.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
4. CULTURAL RESOURCES Would the project: A) Cause a substantial adverse change in the significance of a historical or archaeological resource as defined in § 15064.5?		X	
B) Directly or indirectly destroy a unique paleontological resource?		X	
C) Disturb any human remains?		X	

ENVIRONMENTAL SETTING

The City of Sacramento and the surrounding area are known to have been occupied by Native American groups for thousands of years prior to settlement by non-Native peoples. Archaeological materials, including human burials, have been found throughout the city, some in deeply buried contexts. . One of the tools used to identify the potential for cultural resources to be present in the project area is the 2035 General Plan Background Report. Generalized areas of high sensitivity for cultural resources are located within close proximity to the Sacramento and American Rivers and moderate sensitivity was identified near other watercourses. The proposed project site is not adjacent to these high or moderate sensitivity units shown in the 2035 General Plan Background Report. The 2035 General Plan land use diagram designates a wide swath of land along the American River as Parks, which limits development and impacts on sensitive cultural resources. High sensitivity areas may be found in other areas related to the ancient flows of the rivers, with differing meanders than found today. Recent discoveries during infill construction in downtown Sacramento have shown that the downtown area is highly sensitive for both historic-period archaeological and pre-contact indigenous resources. Native American burials and artifacts were found in 2005 during construction of the New City Hall and historic period archaeological resources are abundant downtown due to the evolving development of the area and, in part, to the raising of the surface street level in the 1860s and 1870s, which created basements out of the first floors of many buildings.

Currently, the project site is undeveloped, with the exception of a concrete pad and two transmission line towers. It appears that discing regularly disturbs the grasses and potentially the topsoil, and localized ground disturbance would have been required to construct the foundations for the two transmission line towers near the project site's northeastern corner.

STANDARDS OF SIGNIFICANCE

For purposes of this Initial Study, cultural resource impacts may be considered significant if the proposed project would result in one or more of the following:

- Cause a substantial change in the significance of a historical or archaeological resource as defined in CEQA Guidelines Section 15064.5; or
- Directly or indirectly destroy a unique paleontological resource; or
- A substantial adverse change in the significance of such resources.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the potential effects of development under the 2035 General Plan on prehistoric and historic resources. See Chapter 4.4.

General Plan policies identified as reducing such effects call for identification of resources on project sites (Policy HCR 2.1.1), implementation of applicable laws and regulations (Policy HCR 2.1.2), early consultation with owners and land developers to minimize effects (Policy HCR 2.1.10) and encouragement of adaptive reuse of historic resources (Policy HCR 2.1.14). Demolition of historic resources is deemed a last resort. (Policy HCR 2.1.15)

The Master EIR concluded that implementation of the 2035 General Plan would have a significant and unavoidable effect on historic resources and archeological resources. (Impacts 4.4-1,2)

ANSWERS TO CHECKLIST QUESTIONS

Questions A through C

The approximately 9.51-acre project site is undeveloped, with the exception of two transmission line towers and a concrete pad that would be removed. The proposed project would include the construction and operation of a 115,468-sf warehouse building, associated parking areas, and two bioretention areas.

To identify any known cultural resources on-site, a records search of the California Historic Resources System (CHRIS) was performed by the North Central Information Center (NCIC) for cultural resource site records and survey reports within the project area. According to the CHRIS search, the site has a low potential for the discovery of prehistoric-period cultural resources.[7] Additionally, a search of the Sacred Lands File maintained by the Native American Heritage Commission (NAHC) was conducted, and returned positive results for the presence of known Native American sacred sites in the project vicinity.[8] Thus, tribal cultural resources are known to occur in the project area.

Due to the predominant historic theme of the region as a whole, which includes thousands of years of occupation by Native American groups prior to non-Native peoples settling in the region, and because cultural resources are known to occur in the project area, the possibility exists that previously unknown resources could be encountered during ground-disturbing activities associated with development of the project. Therefore, the proposed project would have a potentially significant impact related to causing a substantial adverse change in the significance of a historical or archaeological resource, directly or indirectly destroying a unique paleontological resource, and disturbing human remains. However, with implementation of Mitigation Measure 4-1, the ***effect can be mitigated to less than significant***.

MITIGATION MEASURES

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4-1 ***In the Event that Cultural Resources are Discovered During Construction, Implement Procedures to Evaluate Cultural Resources and Implement Avoidance and Minimization Measures to Avoid Significant Impact.***

If archaeological resources, or paleontological resources, are encountered in the project area during construction, the following performance standards shall be met prior to continuance of construction and associated activities that may result in damage to or destruction of cultural resources:

- *Each resource would be evaluated for California Register of Historical Resources (CRHR) eligibility through application of established eligibility criteria (California Code of Regulations 15064.636), in consultation with consulting Native American Tribes.*

7 North Central Information Center. *California Historical Resources Information System Record Search Results for Osage Warehouse Project (APN: 062-0030-012).* July 30, 2021.

8 Native American Heritage Commission. *Re: Osage Warehouse Project Sacramento County.* August 30, 2021.

If a cultural resource is determined to be eligible for listing on the CRHR, the City will avoid damaging effects to the resource in accordance with California PRC Section 21084.3, if feasible. If the City determines that the project may cause a significant impact to a cultural resource, and measures are not otherwise identified in the consultation process, the following are examples of mitigation capable of avoiding or substantially lessening potential significant impacts to a cultural resource or alternatives that would avoid significant impacts to the resource. These measures may be considered to avoid or minimize significant adverse impacts and constitute the standard by which an impact conclusion of less-than significant may be reached:

- *Avoid and preserve resources in place, including, but not limited to, planning construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.*
- *Treat the resource with culturally appropriate dignity taking into account the cultural values and meaning of the resource, including, but not limited to, the following:*
  - *Protect the cultural character and integrity of the resource.*
  - *Protect the traditional use of the resource.*
  - *Protect the confidentiality of the resource.*
  - *Establish permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places.*
  - *Rebury the resource in place.*
  - *Protect the resource.*

Avoidance and preservation in place is the preferred manner of mitigating impacts to archaeological resources and paleontological resources will be accomplished, if feasible, by several alternative means, including:

- *Planning construction to avoid cultural resources, archaeological sites and/ or other resources; incorporating sites within parks, green-space or other open space; covering archaeological sites; deeding a site to a permanent conservation easement; or other preservation and protection methods agreeable to consulting parties and regulatory authorities with jurisdiction over the activity.*
- *The construction contractor(s) will install and maintain protective fencing throughout construction to avoid the site during all remaining phases of construction. The area will be demarcated as an "Environmentally Sensitive Area".*

To implement these avoidance and minimization standards, the following procedures shall be followed in the event of the discovery of an archaeological or paleontological resource:

- *At the developer's expense, the City shall coordinate the investigation of the find with a qualified (meeting the Secretary of the Interior's Qualification Standards for Archaeology) archaeologist approved by the City. As part of the site investigation and resource assessment, the City and the archaeologist shall assess the significance of the find, make recommendations for further evaluation and treatment as necessary and provide proper management recommendations should potential impacts to the resources be determined by the City to be significant. A written report detailing the site assessment, coordination activities, and management recommendations shall be provided to the City representative by the qualified archaeologist. These recommendations will be documented in the project record.*
- *The City shall consider management recommendations for tribal cultural resources, including Native American archaeological resources, that are deemed appropriate, including resource avoidance or, where avoidance is infeasible in light of project design or layout or is unnecessary to avoid significant effects,*

preservation in place or other measures. The contractor shall implement any measures deemed by the City to be necessary and feasible to avoid or minimize significant impacts to the cultural resources.

FINDINGS

All additional significant environmental effects of the project relating to Cultural Resources can be mitigated to a less-than-significant level.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
5. ENERGY Would the project:			
A) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation?			X
B) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X

ENVIRONMENTAL SETTING

Sacramento Municipal Utility District (SMUD) is a community-owned and not-for-profit utility that provides electric services to 900 square miles, including most of Sacramento County (SMUD 2020). Pacific Gas and Electric (PG&E) is an inventory-owned utility that provides electric and natural gas services to approximately 16 million people within a 70,000-square-mile service area in both northern and central California (PG&E 2020). SMUD is the primary electricity supplier, and PG&E is the primary natural gas supplier for the City of Sacramento and the project area.

Energy demand related to the proposed project would include energy directly consumed for space heating and cooling and proposed electric facilities and lighting. Transportation-related energy consumption includes the use of fuels and electricity to power cars, trucks, and public transportation. Energy would also be consumed by equipment and vehicles used during project construction and routine maintenance activities.

Energy Policy and Conservation Act, and CAFE Standards

The Energy Policy and Conservation Act of 1975 established nationwide fuel economy standards to conserve oil. Under this act, the National Highway Traffic and Safety Administration, is responsible for revising existing fuel economy standards and establishing new vehicle economy standards. The Corporate Average Fuel Economy program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Three Energy Policy Acts have been passed, in 1992, 2005, and 2007, to reduce dependence on foreign petroleum, provide tax incentives for alternative fuels, and support energy conservation.

Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 (EPAct) was passed to reduce the Country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAct. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs. The EPAct of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

State of California Energy Efficiency Action Plan

The 2019 California Energy Efficiency Action Plan has three primary goals for the State: double energy efficiency savings by 2030 relative to a 2015 base year (per SB 350), expand energy efficiency in low-income and disadvantaged communities, and reduce GHG emissions from buildings. This plan provides guiding principles and recommendations on how the State would achieve those goals. These recommendations include:

- identifying funding sources that support energy efficiency programs;
- identifying opportunities to improve energy efficiency through data analysis;
- using program designs as a way to encourage increased energy efficiency on the consumer end;
- improving energy efficiency through workforce education and training; and
- supporting rulemaking and programs that incorporate energy demand flexibility and building decarbonization (CEC 2019).

California Green Building Standards

The energy consumption of new residential and non-residential buildings in California is regulated by the State's Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). The California Energy Code was established by the California Energy Commission (CEC) in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and non-residential buildings. CEC updates the California Energy Code every three years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions.

The 2019 California Energy Code was adopted by CEC on May 9, 2018 and applies to projects constructed after January 1, 2020. Non-residential buildings are anticipated to reduce energy consumption by 30 percent as compared to the 2016 California Energy Code primarily through prescriptive requirements for high-efficiency lighting (CEC 2018). The Energy Code is enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary due to local climatologic, geologic, or topographic conditions, provided that these standards exceed those provided in the California Energy Code.

Transportation-Related Regulations

Various regulatory and planning efforts are aimed at reducing dependency on fossil fuels, increasing the use of alternative fuels, and improving California's vehicle fleet. SB 375 aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. CARB, in consultation with the metropolitan planning organizations, provides each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

Pursuant to AB 2076 (Chapter 936, Statutes of 2000), CEC and the CARB prepared and adopted a joint agency report in 2003, Reducing California's Petroleum Dependence. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicle miles traveled (VMT) (CEC and CARB 2003).

AB 1007 (Chapter 371, Statues of 2005) required CEC to prepare the State Alternative Fuels Plan to increase the use of alternative fuels in California.

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025.

On August 2, 2018, the National Highway Traffic Safety Administration (NHTSA) and EPA proposed the Safer Affordable Fuel-Efficient Vehicles Rule (SAFE Rule). Part One of the SAFE Rule revokes a waiver granted by EPA to the State of California under Section 209 of the CAA to enforce more stringent emission standards for motor vehicles than those required by EPA for the explicit purpose of GHG emission reduction, and indirectly, criteria air pollutant and ozone precursor emission reduction. On March 31, 2020, Part Two of the SAFE Rule was published and would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe CO_2 emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026.

GHG Reduction Regulations

Several regulatory measures such as AB 32 and the Climate Change Scoping Plan, Executive Order (EO) B-30-15, SB 32, and AB 197 were enacted to reduce GHGs and have the co-benefit of reducing California's dependency on fossil fuels and making land use development and transportation systems more energy efficient.

Renewable Energy Regulations

SB X1-2 of 2011 required all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.

SB 100, signed in September 2018, requires that all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, supply 44 percent of retail sales from renewable resources by December 31, 2024, 50 percent of all electricity sold by December 31, 2026, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. The law also requires that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change. The Energy Independence and Security Act of 2007 increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020—an increase in fuel economy standards of 40 percent. By addressing renewable fuels and the CAFE standards, the Energy Independence and Security Act of 2007 builds upon progress made by the Energy Policy Act of 2005 in setting out a comprehensive national energy strategy for the 21st century.

Sacramento Climate Action Plan

The Sacramento CAP was adopted on February 14, 2012 by the Sacramento City Council and was incorporated into the 2035 General Plan. The Sacramento CAP includes GHG emission reduction targets, strategies, and implementation measures developed to help the City reach these targets. Reduction strategies address GHG emissions associated with transportation and land use, energy, water, waste management and recycling, agriculture, and open space.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Structures built would be subject to Titles 20 and 24 of the CCR, which reduce demand for electrical energy by implementing energy-efficient standards for residential and non-residential buildings. The 2035 General Plan includes policies (see 2035 General Plan Energy Resources Goal U 6.1.1) and related policies to encourage energy-efficient technology by offering rebates and other incentives to commercial and residential developers, coordination with local utility providers and recruitment of businesses that research and promote energy conservation and efficiency.

The Master EIR discussed energy conservation and relevant General Plan policies in section 6.3 (page 6-3). The discussion concluded that with implementation of the General Plan policies and energy regulation (e.g., Title 24) development allowed in the General Plan would not result in the inefficient, wasteful or unnecessary consumption of energy.

The Master EIR concluded that implementation of state regulation, coordination with energy providers and implementation of General Plan policies would reduce the potential impacts from construction of new energy production or transmission facilities to a less-than-significant level.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, an impact is considered significant if the proposed project would:

- Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation; and/or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

ANSWERS TO CHECKLIST QUESTIONS

Questions A and B

Neither federal or State law nor the State CEQA Guidelines establish thresholds that define when energy consumption is considered wasteful, inefficient and unnecessary. Compliance with CCR Title 24 Energy Efficiency Standards would result in energy-efficient buildings. However, compliance with building codes does not adequately address all potential energy impacts during construction and operation. For example, energy would be required to transport people and goods to and from the project site. Energy use is discussed by anticipated use type below.

Construction

Construction of the proposed project would involve on-site energy demand and consumption related to use of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the sites where energy supply cannot be met via a hookup to the existing electricity grid.

Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only portions of the project site and off-site improvement areas would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site, rather than a single location. In addition, all construction equipment and operation thereof would be regulated per the CARB In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. The In-Use Off-Road Diesel Vehicle

Regulation would subsequently help to improve fuel efficiency and reduce GHG emissions. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to reduce demand on oil and emissions associated with construction.

The CARB has prepared the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan), which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes, zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather than operating temporary gasoline/diesel-powered generators, and increasing use of electric and renewable fuel-powered construction equipment. The CARB's In-Use Off-Road Diesel Vehicle Regulation described above, with which the proposed project must comply, would be consistent with the intention of the 2017 Scoping Plan and the recommended actions included in Appendix B of the 2017 Scoping Plan.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, construction activities would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Operations

The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code, the Building Energy Efficiency Standards, and all applicable regulations included within the City's Climate Action Plan would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. Required compliance with the CBSC would ensure that the building energy use associated with the project would not be wasteful, inefficient, or unnecessary. In addition, electricity supplied to the project by SMUD would comply with the State's Renewables Portfolio Standard, which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 and to 60 percent by 2030. As a result, a portion of the electricity consumed during project operations would be generated from renewable sources. Pursuant to the 2019 CBSC, Title 24, Part 6, Section 110.10, the proposed project would be required to be solar-ready, given that the proposed project is a non-residential building with three stories or fewer.

Structures built as part of the proposed project would be subject to Titles 20 and 24 of the CCR, which reduce demand for electrical energy by implementing energy-efficient standards for residential and non-residential buildings. The 2035 General Plan includes goals (Energy Resources Goal U 6.1.1) and related policies to encourage energy-efficient technology by offering rebates and other incentives to commercial and residential developers, coordination with local utility providers, and recruitment of businesses that research and promote energy conservation and efficiency.

With regard to transportation energy use, the proposed project would comply with all applicable regulations associated with vehicle efficiency and fuel economy. In addition, as discussed in Section 12, Transportation, of this Initial Study, the VMT associated with development of the proposed project is anticipated to be less than the average employee VMT for the region.

The Master EIR discussed energy conservation and relevant General Plan policies in Section 6.3 (page 6-3). The discussion concluded that with implementation of the 2035 General Plan policies and energy regulation (e.g., Title 24, Part 6 CCR), development facilitated by the 2035 General Plan would not result in the inefficient, wasteful, or unnecessary consumption of energy. Furthermore, the proposed project would be consistent with the General Plan land use designation for the site and, therefore, development of the site with similar uses has already been evaluated in the Master EIR and accounted for in City planning efforts.

Given that the proposed project would be required to comply with all applicable regulations related to energy efficiency, including Titles 20 and 24 of the CCR, and the applicable policies of the 2035 General Plan, consistent with the Master EIR, and would result in a less-than-significant impact regarding VMT, the proposed project would not result in impacts related to energy.

Conclusion

Based on the above, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Thus, implementation of the proposed project would have ***no additional significant environmental effect*** related to energy beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Energy.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
6. GEOLOGY AND SOILS Would the project: A) Would the project allow a project to be built that will either introduce geologic or seismic hazards by allowing the construction of the project on such a site without protection against those hazards?		X	

ENVIRONMENTAL SETTING

Seismicity

The City of Sacramento is not located within an Alquist-Priolo Earthquake Fault Zone, and known faults do not exist within the Policy Area. Therefore, fault rupture within the Policy Area is highly unlikely and, consequently, implementation of buildout of the General Plan, would not expose people or structures to the possibility of fault rupture.

Nonetheless, the City may be subject to seismic hazards caused by major seismic events outside the City. Per the Master EIR, the greatest earthquake threat to the City comes from earthquakes along Northern California's major faults, including the San Andreas, Calaveras, and Hayward faults. Ground shaking on any of the aforementioned faults could cause shaking within the City to an intensity of 5 to 6 moment magnitude (Mw). As such, the City's seismic ground-shaking hazard is low, ranking among the lowest in the State. Additionally, the City is in Seismic Zone 3. Accordingly, any future development, rehabilitation, reuse, or possible change of use of a structure would be required to comply with all design standards applicable to Seismic Zone 3.

Topography

Terrain in the City of Sacramento features very little relief and the potential for slope instability within the City is minor due to the relatively flat topography of the area. Consistent with the majority of the City, the topography of the project site is relatively level.

Regional Geology

The City of Sacramento is located in the Great Valley Geomorphic Province. The Great Valley Geomorphic Province consists of a deep, northwest-trending sedimentary basin that borders the east of the Coast Ranges. The Great Valley Geomorphic Province is a flat alluvial plain approximately 50 miles wide and 400 miles long in the central portion of California. The northern portion of the Great Valley Geomorphic Province is the Sacramento Valley drained by the Sacramento River, and the southern part is the San Joaquin Valley drained by the San Joaquin River. The valley is surrounded by the Sierra Nevada to the east, the Tehachapi Mountains to the south, Coastal Range to the west, and Cascade Range to the north.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, an impact is considered significant if it allows a project to be built that would either introduce geologic or seismic hazards by allowing the construction of the project on such a site without protection against those hazards.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Chapter 4.5 of the Master EIR evaluated the potential effects related to seismic hazards, underlying soil characteristics, slope stability, erosion, existing mineral resources and paleontological resources in the City. Implementation of identified policies in the 2035 General Plan reduced all effects to a less-than-significant level. Policy EC 1.1.1 requires regular review of the City's seismic and geologic safety standards, and Policy EC 1.1.2 requires geotechnical investigations for project sites to identify and respond to geologic hazards, when present.

ANSWERS TO CHECKLIST QUESTIONS

Question A

The project site's topography is relatively flat, the site is not located within an Alquist-Priolo Earthquake Fault Zone, and the site is not located in the immediate vicinity of an active fault. However, Sacramento is located in a moderate seismically-active region. The 2035 General Plan indicates that ground shaking would occur periodically in Sacramento as a result of distant earthquakes. The 2035 General Plan further states that the earthquake resistance of any building is dependent on an interaction of seismic frequency, intensity, and duration with the structure's height, condition, and construction materials. Although the project site is not located near any active or potentially active faults, strong ground shaking could occur at the project site during a major earthquake on any of the major regional faults.

The proposed project would include the development of a 115,468-sf warehouse building. Due to the seismic activity in the State, construction is required to comply with Title 24 of the Uniform Building Code (UBC). Chapter 15.20 of the Sacramento City Code adopts the UBC and mandates compliance; therefore, all new construction and modifications to existing structures within the City are subject to the requirements of the UBC. The UBC contains standards to ensure that all structures and infrastructure are constructed to minimize the impacts from seismic activity, to the extent feasible, including exposure of people or structures to substantial, adverse effects as a result of strong groundshaking, seismic-related ground failure, liquefaction, lateral spreading, landslides, or lurch cracking. As a result, seismic activity in the area of the proposed development would not expose people or structures to substantial, adverse effects as a result of strong groundshaking and seismic-related ground failure.

In addition, issues related to fault rupture, seismic groundshaking, and seismically induced ground failure are addressed in the City's adopted Standard Specifications for Public Works Construction (2020), which requires construction contractors to build to City standards related to structural integrity, thus, ensuring that erosion and unstable soil conditions do not occur as a result of construction.[9] The construction specification document contains provisions that require contractors to be responsible for damage caused during construction and to be responsible for the repair of such damages (e.g., settling of adjacent land and structures). The proposed project would require heavy construction, and individual components used in the construction of the project would be constructed to industry-provided design specifications and requirements, including the American Society for Testing and Materials (ASTM) standards.

Soils typically found most susceptible to liquefaction are saturated and loose, fine to medium grained sand. Liquefaction occurs where surface soils become saturated with water and become mobile during groundshaking caused by a seismic event. When soils subject to liquefaction move, the foundations of structures move as well which can cause structural damage. Liquefaction generally occurs below the water table, but could move upward through soils after development. The Master EIR identified soils subject to liquefaction to be found within areas primarily within the Central City, Pocket, and North and South Natomas Community. The project site is not located in any of the aforementioned areas, but the Master EIR recommends using site-specific geotechnical studies to conclusively determine if a specific location may be subject to liquefaction hazard.

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[9] City of Sacramento. *Standard Specifications for Public Construction*. Available at: https://www.cityofsacramento.org/-/media/Corporate/Files/DOU/Specs-Drawings/Standard_Specifications.pdf?la=en. Accessed August 2021.

A search of the United States Department of Agriculture (USDA) Natural Resource Conservation Service Web Soil Survey was conducted to determine characteristics of the soil at the project site that could potentially cause significant impacts if the development of the site were to occur. The search determined the project site consists of San Joaquin silt loam. According to the Web Soil Survey, San Joaquin silt loam has a shrink-swell potential of 0.01, meaning that expansive soil would likely not be a limitation on the proposed project. However, San Joaquin silt loam has a medium susceptibility to compaction, meaning that the compaction potential could be significant.[10]

As such, without further investigation and preparation of site-specific soil testing, the proposed project could potentially introduce geologic or seismic hazards by allowing the construction of the project site without protection against settlement and liquefaction hazards, and a potentially significant impact could occur. However, with implementation of Mitigation Measure 6-1, the ***effect can be mitigated to less than significant***.

MITIGATION MEASURES

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

6-1 *Prior to issuance of a grading permit, the applicant shall retain the services of a qualified geologist to prepare a design-level Geotechnical Report for the project site. The grading plans shall incorporate all geotechnical recommendations specified in the Geotechnical Report prepared for the proposed project. All grading and foundation plans for the development must be reviewed and approved by the City Engineer and Chief Building Official prior to issuance of grading and building permits in order to ensure that recommendations in the Geotechnical Report are properly incorporated and utilized in the project design.*

FINDINGS

All additional significant environmental effects of the project relating to Geology and Soils can be mitigated to a less-than-significant level.

[10] USDA Natural Resource Conservation Service. *Web Soil Survey.* Available at: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed August 2021.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
7. HAZARDS Would the project: A) Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated soil during construction activities?			X
B) Expose people (e.g., residents, pedestrians, construction workers) to asbestos-containing materials or other hazardous materials?			X
C) Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated groundwater during dewatering activities?			X

ENVIRONMENTAL AND REGULATORY SETTING

Federal regulations and regulations adopted by the SMAQMD apply to the identification and treatment of hazardous materials, including asbestos, during demolition and construction activities. Failure to comply with these regulations respecting asbestos may result in a Notice of Violation being issued by the SMAQMD and civil penalties under State and/or federal law, in addition to possible action by U.S. EPA under federal law.

Federal law covers a number of different activities involving asbestos, including demolition and renovation of structures (40 CFR § 61.145).

SMAQMD Rule 902 and Commercial Structures

The work practices and administrative requirements of Rule 902 apply to all commercial renovations and demolitions where the amount of Regulated Asbestos-Containing Material (RACM) is greater than:

- 260 lineal feet of RACM on pipes, or
- 160 square feet of RACM on other facility components, or
- 35 cubic feet of RACM that could not be measured otherwise.

The administrative requirements of Rule 902 apply to any demolition of commercial structures, regardless of the amount of RACM. To determine the amount of RACM in a structure, Rule 902 requires that a survey be conducted prior to demolition or renovation unless:

- The structure is otherwise exempt from the rule, or
- Any material that has a propensity to contain asbestos (so-called "suspect material") is treated as if it is RACM.

Surveys must be done by a licensed asbestos consultant and require laboratory analysis. Asbestos consultants are listed in the phone book under "Asbestos Consultants." Large industrial facilities may use non-licensed employees if those employees are trained by the U.S. EPA. Questions regarding the use of non-licensed employees should be directed to the SMAQMD.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, an impact is considered significant if the proposed project would:

- Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated soil during construction activities;
- Expose people (e.g., residents, pedestrians, construction workers) to asbestos-containing materials or other hazardous materials; or
- Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated groundwater during dewatering activities.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated effects of development on hazardous materials, emergency response and aircraft crash hazards in Chapter 4.6. Implementation of the General Plan may result in the exposure of people to hazards and hazardous materials during construction activities, and exposure of people to hazards and hazardous materials during the life of the General Plan. Impacts identified related to construction activities and operations were found to be less than significant. Policies included in the 2035 General Plan, including PHS 3.1.1 (investigation of sites for contamination) and PHS 3.1.2 (preparation of hazardous materials actions plans when appropriate) were effective in reducing the identified impacts.

ANSWERS TO CHECKLIST QUESTIONS

Question A

Per the Master EIR, grading, excavation, and dewatering of sites for new development may expose construction workers and the public to known or previously unreported hazardous substances present in the soil or groundwater. If new development is proposed at or near a documented or suspected hazardous materials site, investigation, remediation, and cleanup of the site would be required before construction could begin. The project site is not located on a hazardous waste facility or site with known contamination within the EnviroStor Database.[11] The closest listed hazardous sites are 5200 Watt Avenue and 6000 88th Street, both of which are located within one mile of the project site, approximately 0.15 mile south and 0.50 mile southwest of the project site, respectively.[12] The closest site is associated with McClellan Air Force Base, and is a tiered permit labeled directly on South Watt Avenue. The other site is located within the industrial area to the west of the project site, and was listed because of the use and storage of corrosive industrial cleaning chemicals.[13]

Based on historical imagery, the project site remained entirely undeveloped until approximately 2002, when the two transmission towers were installed. The concrete pad was installed by 2007. The project site does not appear to have been used for agricultural uses and, thus, evidence to suggest the on-site use of pesticides or other agricultural chemicals does not exist.

Because the project site is not expected to contain contaminated soils, impacts related to exposing people to existing contaminated soils or groundwater during construction activities would be less-than-significant. Thus, implementation of the proposed project would have ***no additional significant environmental effect*** related to exposing people to existing contaminated soil during construction activities beyond what was previously evaluated in the Master EIR.

Question B

Asbestos is the name for a group of naturally occurring silicate minerals that are considered to be “fibrous” and, through processing, can be separated into smaller and smaller fibers. The fibers are strong, durable, chemical resistant, and resistant to heat and fire. They are also long, thin and flexible, so they can even be woven into cloth. Because of these qualities, asbestos was considered an ideal product and has been used

[11] Department of Toxic Substances Control. *EnviroStor*. Available at: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=8981+osage+avenue+sacramento+ca. Accessed August 2021.
[12] *Ibid*.
[13] *Ibid*.

in thousands of consumer, industrial, maritime, automotive, scientific and building products. However, later discoveries found that, when inhaled, the material caused serious illness.

For buildings constructed prior to 1980, the Code of Federal Regulations (29 CFR 1926.1101) states that all thermal system insulation (boiler insulation, pipe lagging, and related materials) and surface materials must be designated as "presumed asbestos-containing material" unless proven otherwise through sampling in accordance with the standards of the Asbestos Hazard Emergency Response Act. Asbestos-containing materials could include, but are not limited to, plaster, ceiling tiles, thermal systems insulation, floor tiles, vinyl sheet flooring, adhesives, and roofing materials.

Lead-based paint (LBP) is defined as any paint, varnish, stain, or other applied coating that has one milligram per cubic centimeter or greater (5,000 micrograms per gram or 5,000 ppm) of lead by federal guidelines. Lead is a highly toxic material that may cause a range of serious illnesses and, in some cases, death. In buildings constructed after 1978, LBP is unlikely to be present. Structures built prior to 1978 and especially prior to the 1960s should be expected to contain LBP.

The proposed project would not require the demolition of any existing structures and, therefore, implementation of the proposed project would not involve potential exposure to asbestos or LBP.

Therefore, implementation of the proposed project would have ***no additional significant environmental effect*** related to exposing people to asbestos-containing materials or other hazardous materials beyond what was previously evaluated in the Master EIR.

Question C

Dewatering refers to the removal of water from the surface or ground, and can be required during construction work if the project site includes ponded areas or a high groundwater level. The proposed project is not anticipated to involve dewatering activities. While not expected, should construction of the project encounter groundwater and require dewatering, the project would be required to comply with all applicable regulations established by the Regional Water Quality Control Board. Therefore, impacts related to exposing people to existing contaminated groundwater during dewatering activities would be less than significant, and construction of the proposed project would have ***no additional significant environmental effect*** related to groundwater contamination beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Hazards.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
8. HYDROLOGY AND WATER QUALITY Would the project: A) Substantially degrade water quality and violate any water quality objectives set by the State Water Resources Control Board, due to increases in sediments and other contaminants generated by construction and/or development of the project?			X
B) Substantially increase the exposure of people and/or property to the risk of injury and damage in the event of a 100-year flood?			X

ENVIRONMENTAL SETTING

Currently, the project site is an undeveloped grass/dirt field, with the exception of the concrete pad and the two transmission line towers. The site is located in an area with industrial and residential land uses, including a mix of permeable surfaces, such as other grassy fields, and impervious surfaces, such as roads, sidewalks, and parking areas. The project site currently does not contain any drainage infrastructure.

The City of Sacramento's Grading Ordinance requires that development projects comply with the requirements of the City's Stormwater Quality Improvement Plan (SQIP). The SQIP outlines the priorities, key elements, strategies, and evaluation methods of the City's Stormwater Management Program. The City's Stormwater Management Program is based on the National Pollutant Discharge Elimination System (NPDES) municipal stormwater discharge permit. The comprehensive Stormwater Management Program includes pollution reduction activities for construction sites, industrial sites, illegal discharges and illicit connections, new development, and municipal operations. In addition, before the onset of any construction activities, where the disturbed area is one acre or more in size, projects are required to obtain coverage under the NPDES General Construction Permit and include erosion and sediment control plans. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater and other non-point source runoff. Measures that reduce or eliminate post-construction-related water quality problems range from source controls, such as reduced surface disturbance, to treatment of polluted runoff, such as detention or retention basins. The City's SQIP and the *Stormwater Quality Design Manual for the Sacramento Region* (Sacramento Stormwater Quality Partnership 2014) include BMPs to be implemented to mitigate impacts from new development and redevelopment projects, as well as requirements for low impact development (LID) standards.

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRM) that delineate flood hazard zones for communities. The majority of the project site is designated by FIRM *Community Panel Number 06067C0215H* as being in an area of minimal flood hazard. A small and irregularly shaped portion along the southern boundary of the project site, closest to Morrison Creek, is designated as having a 0.2 percent annual chance of flood, meaning it is within the 500-year flood plain.[14] However, the project site is not located within a 100-year flood plain or otherwise located within a Special Flood Hazard Zone.

Section 13.08.145 of the Sacramento City Municipal Code (Mitigation of drainage impacts; design and procedures manual for water, sanitary sewer, storm drainage, and water quality facilities) requires that

[14] Federal Emergency Management Agency. *Flood Insurance Rate Map Community Panel Number 06067C0215H*. Available at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-121.37894748773853,38.51884549926846,-121.35817646112666,38.52723928717955. Accessed August 2021.

when a property contributes drainage to the storm drain system or combined sewer system, all stormwater and surface runoff drainage impacts resulting from the improvement or development must be fully mitigated to ensure that the improvement or development does not affect the function of the storm drain system or combined sewer system, and that an increase in flooding or in water surface elevation that adversely affects individuals, streets, structures, infrastructure, or property does not occur. The project is within the service area of the SASD. Fees, which are used to recover a share of SASD's cost for any new system facilities, are required to service new connections.[15] In addition to sewer service provided by SASD, the project would also be within the SRCSD. In order to connect with the SRCSD wastewater conveyance and treatment system, developers must pay impact fees.[16]

STANDARDS OF SIGNIFICANCE

For purposes of this Initial Study, impacts to hydrology and water quality may be considered significant if construction and/or implementation of the proposed project would result in the following impacts that remain significant after implementation of general plan policies or mitigation from the 2035 General Plan Master EIR:

- Substantially degrade water quality and violate any water quality objectives set by the State Water Resources Control Board (SWRCB), due to increases in sediments and other contaminants generated by construction and/or development of the proposed project; or
- Substantially increase the exposure of people and/or property to the risk of injury and damage in the event of a 100-year flood.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Chapter 4.7 of the Master EIR evaluates the potential effects of the 2035 General Plan as they relate to surface water, groundwater, flooding, stormwater and water quality. Potential effects include water quality degradation due to construction activities (Impacts 4.7-1, 4.7-2), and exposure of people to flood risks (Impacts 4.7-3). Policies included in the 2035 General Plan, including a directive for regional cooperation (Policies ER 1.1.2, EC 2.1.1), comprehensive flood management (Policy EC 2.1.23), and construction of adequate drainage facilities with new development (Policy ER 1.1.1 to ER 1.1.10) were identified that the Master EIR concluded would reduce all impacts to a less-than-significant level.

ANSWERS TO CHECKLIST QUESTIONS

<u>Question A</u>

The proposed project has the potential to effect water quality during both construction and operation. Further details regarding the potential effects are provided below.

Construction

Construction activities associated with the proposed project would create the potential to degrade water quality from increased sedimentation and increased discharge (increased flow and volume of runoff) associated with stormwater runoff. The SWRCB adopted a statewide general NPDES permit for stormwater discharges associated with construction activity. Dischargers whose projects disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2012-0006-DWQ. Construction activity subject to the General Permit includes clearing, grading and disturbances to the ground such as stockpiling,

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15 Sacramento Area Sewer District. *Sewer Ordinance SDI-0072*. Effective May 27, 2016.
16 Regional San. *Impact Fees.* Available at: https://www.regionalsan.com/impact-fees-businesses. Accessed March 2021.

or excavation. The proposed project would include disturbance of approximately 9.51 acres; thus, the project would be subject to the aforementioned regulations.

The City's SQIP contains a Construction Element that guides implementation of the NPDES Permit for Storm Water Discharges Associated with Construction Activity. This Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list BMPs the discharger would use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Section A of the Construction General Permit describes the elements that must be contained in a SWPPP. Compliance with City requirements to protect storm water inlets would require the developer to implement BMPs such as the use of straw wattles, sandbags, gravel traps, and filters; erosion control measures such as vegetation and physical stabilization; and sediment control measure such as fences, dams, barriers, berms, traps, and basins. City staff inspects and enforces the erosion, sediment and pollution control requirements in accordance with City codes (Grading, Erosion and Sediment Control Ordinance).

Conformance with City regulations and permit requirements along with implementation of a SWPPP would ensure that construction activities of the proposed project would result in a less-than-significant impact related to water quality.

Operations

Development of the project site would involve developing the approximately 9.51-acre project site with a warehouse and paved parking areas. Thus, the proposed project would change the site conditions from mostly pervious grassland to mostly impervious paved areas, with the exception of the bioretention areas and other landscaped areas. As a result, following implementation of the project, less pervious surface area would be available on-site for stormwater to infiltrate on-site soils. Consistent with Chapter 13.16 of the Municipal Code, the stormwater control plan would be designed such that the post-development stormwater flows from the site would be equal to or less than predevelopment conditions.

All stormwater from impervious surfaces at the site would be routed into the proposed bioretention area. The design of the proposed project provides for containment of runoff water associated with the site through the use of the bioretention areas; therefore, discharge of runoff to surface waters or groundwater would not result from the proposed project.

As a standard Condition of Approval (COA) for development projects in the City, the City's Department of Utilities requires preparation and submittal of project-specific drainage studies. With submittal of the required drainage study, the Department of Utilities would review the Improvement Plans for the proposed project prior to approval to ensure that adequate water quality control facilities are incorporated. The on-site water quality treatment features would be required to be designed in accordance with the applicable provisions set forth by the *Sacramento Region Stormwater Quality Design Manual*. It should be noted that the proposed project would comply with Section 13.08.145, Mitigation of drainage impacts; design and procedures manual for water, sanitary sewer, storm drainage, and water quality facilities, of the Municipal Code, which requires the following:

> "When property that contributes drainage to the storm drain system or combined sewer system is improved or developed, all stormwater and surface runoff drainage impacts resulting from the improvement or development shall be fully mitigated to ensure that the improvement or development does not affect the function of the storm drain system or combined sewer system, and that there is no increase in flooding or in water surface elevation that adversely affects individuals, streets, structures, infrastructure, or property."

Considering the planned bioretention areas, and the required preparation of a site-specific drainage study, adverse impacts related to water quality during project operations would not occur.

Conclusion

Design of the project and conformance with City and State regulations would ensure that a substantial degradation to water quality or violation of any water quality objectives due to increases in sediments and other contaminants generated by construction and/or development of the proposed project would not occur. Therefore, the proposed project would not result in significant impacts related to substantial degradation of water quality or violation of any water quality objectives set by the SWRCB due to increases in sediments and other contaminants generated by construction and/or development of the proposed project. Implementation of proposed project would have ***no additional significant environmental effect*** related to drainage and runoff beyond what was previously evaluated in the Master EIR.

Question B

A floodplain is an area that is inundated during a flood event and is often physically discernable as a broad, flat area created by historic flood. As previously discussed, according to FEMA's FIRM, the project site is located within an area of minimal flood hazard, with a portion along the southern boundary of the project site being within a 500-year flood plain.

Thus, impacts related to substantially increasing the exposure of people and/or property to the risk of injury and damage in the event of a 100-year flood would be considered less than significant, and implementation of the proposed project would have ***no additional significant environmental effect*** related to flooding beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Hydrology and Water Quality.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
9. NOISE Would the project: A) Result in exterior noise levels in the project area that are above the upper value of the normally acceptable category for various land uses due to the project's noise level increases?		X	
B) Result in residential interior noise levels of 45 dBA L_{dn} or greater caused by noise level increases due to the project?		X	
C) Result in construction noise levels that exceed the standards in the City of Sacramento general plan or Noise Ordinance?			X
D) Permit existing and/or planned residential and commercial areas to be exposed to vibration-peak-particle velocities greater than 0.5 inches per second due to project construction?		X	
E) Permit adjacent residential and commercial areas to be exposed to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic and rail operations?			X
F) Permit historic buildings and archaeological sites to be exposed to vibration-peak-particle velocities greater than 0.2 inches per second due to project construction and highway traffic?			X

ENVIRONMENTAL SETTING

The discussions below are based on the Environmental Noise Assessment prepared for the proposed project by Saxelby Acoustics LLC, dated May 9, 2022.[17] The following section presents basic information related to noise and vibration, as well as the existing noise environment at the project site.

Noise

Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz). Discussing sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel (dB) scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference defined as 0 dB. Other sound pressures are compared to the reference pressure and the logarithm is taken to keep the numbers in practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. A strong correlation exists between the way humans perceive sound and A-weighted sound levels. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment for community exposures. All sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

[17] Saxelby Acoustics LLC. *Environmental Noise Assessment, Osage Warehouse.* May 9, 2022.

Community noise is commonly described in terms of the “ambient” noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors, day-night average level (L_{dn}) and the community noise equivalent level (CNEL), and shows very good correlation with community response to noise for the average person. The median noise level descriptor, denoted L_{50}, represents the noise level which is exceed 50 percent of the hour. In other words, half of the hour ambient conditions are higher than the L_{50} and the other half are lower than the L_{50}.

The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 dB weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, L_{dn} tends to disguise short-term variation in the noise environment. Where short-term noise sources are an issue, noise impacts maybe assessed in terms of maximum noise levels, hourly averages, or other statistical descriptors.

The CNEL is similar to the L_{dn}, except CNEL has an additional weighting factor. Both average noise energy over a 24-hour period. The CNEL applies a +5 dB weighting to events that occur between 7:00 PM and 10:00 PM, in addition to the +10 dB weighting between 10:00 PM and 7:00 AM associated with L_{dn}. Typically, the CNEL and L_{dn} result in similar results for the same noise events, with the CNEL sometimes resulting in reporting a 1 dB increase compared to the L_{dn} to account for noise events between 7:00 PM and 10:00 PM that have the additional weighting factor.

Vibration

Vibration is like noise in that vibration involves a source, a transmission path, and a receiver. While vibration is related to noise, vibration differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and a frequency. A person’s perception to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement. Vibration magnitude is measured in vibration decibels (VdB) relative to a reference level of 1 micro-inch per second peak particle velocity (ppv), the human threshold of perception. The background vibration level in residential areas is usually 50 VdB or lower. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible. The range of environmental interest is typically from 50 VdB to 90 VdB (or 0.12 inch per second ppv), the latter being the general threshold where structural damage can begin to occur in fragile buildings.

Existing Noise Environment

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise. Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located east and south of the project site.

To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hour) noise level measurements at two locations on the project site and short-term noise level measurements at two locations. The long-term noise measurement locations are shown on Figure 7, and a summary of the noise level measurement survey results is provided in Table 5.

Figure 7
Noise Measurement Sites

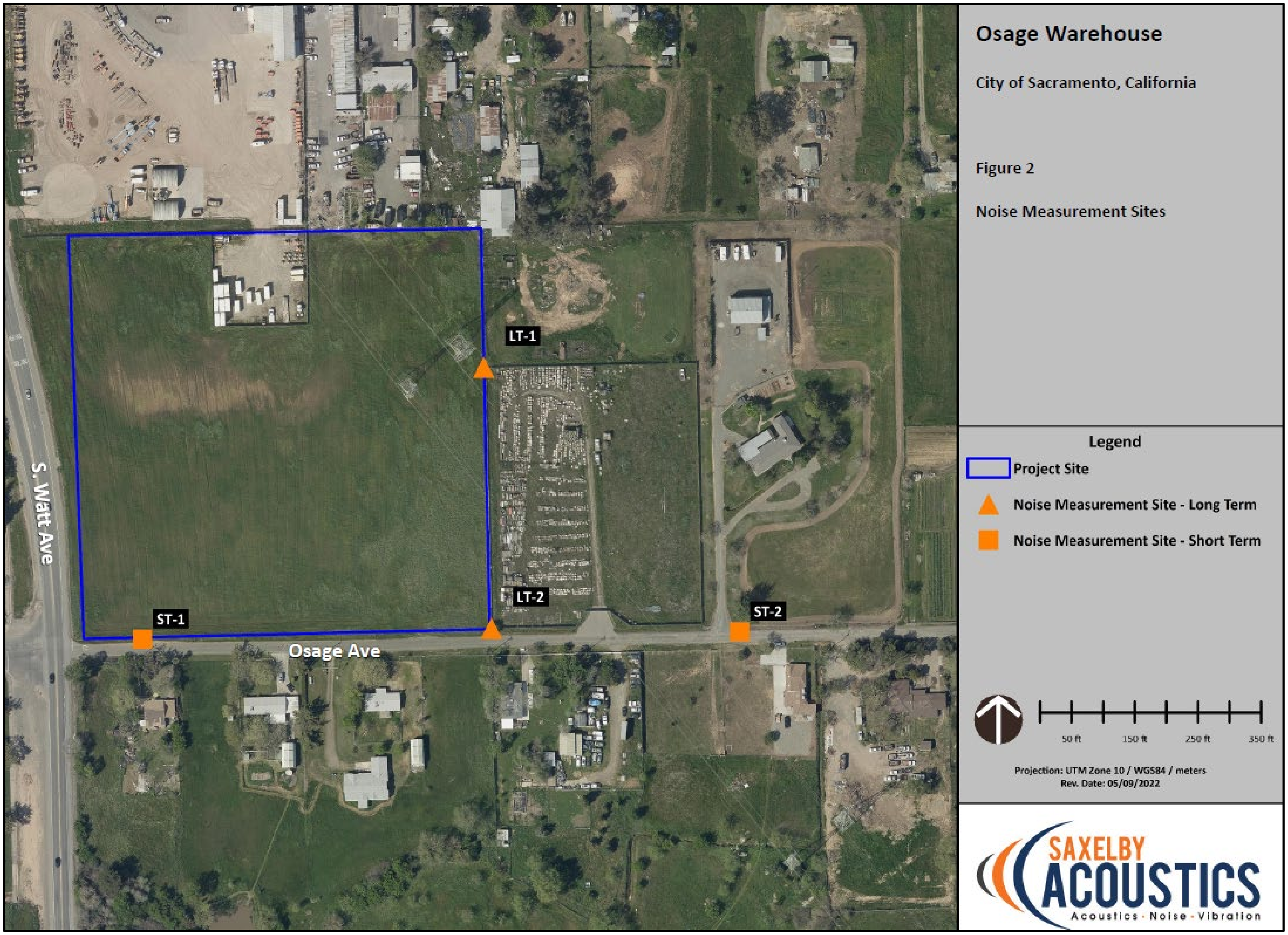


Table 5 Summary of Existing Background Noise Measurement Data (dBA)								
			Daytime (7:00 AM - 10:00 PM)			Nighttime (10:00 PM - 7:00 AM)		
Site	Date	CNEL/L_{dn}	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
LT-1: 735 feet to CL of South Watt Ave.	8/19/21	59	53	51	66	53	51	64
LT-2: 690 ft. to CL of South Watt Ave.	8/19/21	59	59	53	66	53	51	64
ST-1: 140 ft. to CL of South Watt Ave.	8/20/21	N/A	62	61	54	N/A	N/A	N/A
ST-2: 1,080 ft. to CL of South Watt Ave.	8/20/21	N/A	50	49	47	N/A	N/A	N/A
Source: Saxelby Acoustics, 2022.								

STANDARDS OF SIGNIFICANCE

For purposes of this Initial Study, impacts due to noise may be considered significant if construction and/or implementation of the proposed project would result in the following impacts that remain significant after implementation of General Plan policies:

- Result in exterior noise levels in the project area that are above the upper value of the normally acceptable category for various land uses due to the project's noise level increases;
- Result in residential interior noise levels of 45 dBA L_{dn} or greater caused by noise level increases due to the project;
- Result in construction noise levels that exceed the standards in the City of Sacramento Noise Ordinance;
- Permit existing and/or planned residential and commercial areas to be exposed to vibration-peak-particle velocities greater than 0.5 inches per second due to project construction;
- Permit adjacent residential and commercial areas to be exposed to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic and rail operations; or
- Permit historic buildings and archaeological sites to be exposed to vibration-peak-particle velocities greater than 0.2 inches per second due to project construction and highway traffic.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the potential for development under the 2035 General Plan to increase noise levels in the community. New noise sources include vehicular traffic, aircraft, railways, light rail and stationary sources. The general plan policies establish exterior (Policy EC 3.1.1) and interior (EC 3.1.3) noise standards. A variety of policies provide standards for the types of development envisioned in the General Plan.

See Policy EC 3.1.8, which requires new mixed-use, commercial, and industrial development to mitigate the effects of noise from operations on adjoining sensitive land use, and Policy 3.1.9, which calls for the City to limit hours of operations for parks and active recreation areas to minimize disturbance to nearby residences. Notwithstanding application of the general plan policies, noise impacts for exterior noise levels (Impact 4.8-1) and interior noise levels (Impact 4.8-2), and vibration impacts (Impact 4.8-4) were found to be significant and unavoidable.

ANSWERS TO CHECKLIST QUESTIONS

Questions A and B

Operational noise associated with the proposed project is discussed in further detail below.

Traffic Noise at Off-Site Receptors

The City of Sacramento General Plan Noise Element specifies criteria to determine the significance of traffic noise impacts. An increase in the traffic noise level of 1 dB or more would be significant where the pre-project noise levels are less than 75 dB L_{dn}, or 2 dB or more where existing noise levels are less than 65 dB L_{dn}.

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels were predicted at nearby sensitive receptors under project and no-project conditions using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. Project trip generation volumes were provided by the project traffic engineer, and truck usage and vehicle speeds on the local roadways were estimated based on field observations. Traffic noise levels were predicted at the sensitive receptors located at the closest typical setback distance along each roadway segment.

According to Table 6, the maximum noise level increase along Osage Avenue is predicted to be 1.4 dBA L_{dn} near the project driveway. For this roadway segment, the existing ambient noise level at the nearest sensitive receptor is 60.0 dBA which is less than the 2 dB significant increase criterion. The highest ambient noise level of 67.4 dBA occurs directly adjacent to South Watt Avenue. The noise level increase along this segment is predicted to be 0.5 dBA which is less than the 1 dB significant increase criterion.

Table 6
Predicted Traffic Noise Level and Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors			Applicable Significance Threshold (dB)
		Existing No Project	Existing + Project	Change	
Osage Avenue	East of South Watt Ave.	67.4	67.9	0.5	1
Osage Avenue	West of Project Driveway 1	62.5	62.5	0.0	2
Osage Avenue	West of Project Driveway 2	60.0	61.4	1.4	2

Source: Saxelby Acoustics, 2022.

Therefore, impacts resulting from increased traffic noise would be considered less-than-significant.

Operational Noise at Off-Site Receptors

Sources of operational noise would include noise from the loading docks, truck circulation, and parking lot circulation. To determine typical loading dock and truck circulation noise levels associated with the proposed loading docks, noise level measurement data from an existing warehouse was used. The noise level measurements were conducted at a distance of 100 feet from the center of the loading dock area. Activities during the peak hour of loading dock activities included truck arrival/departures, truck idling, truck backing, air brake release, and operation of truck-mounted refrigeration units. The results of the loading dock and truck circulation noise measurements indicate that a busy hour generated an average noise level of 64 dBA L_{50} and 92 dBA L_{max} at the boundary of the truck maneuvering lanes. Because the proposed project would provide parking stalls for 116 passenger vehicles, parking lot circulation noise was conservatively assumed to result in a peak hour movement of 116 vehicles on site. Based upon noise measurements conducted of vehicle movements in parking lots, the sound exposure level for a single passenger vehicle is 71 dBA at a distance of 50 feet.

Saxelby Acoustics used the SoundPLAN noise model to calculate noise levels from loading docks, truck circulation, and parking lot circulation at the nearest sensitive receptors. The project noise level contours for the nighttime (10:00 PM to 7:00 AM) L_{max} are presented in Figure 8.

The City of Sacramento and County of Sacramento noise level standards require that new projects in the vicinity of existing sensitive receptors generate noise levels no greater than 55 dBA L_{50} and 75 dBA L_{max} during daytime (7:00 AM to 10:00 PM) hours and 50 dBA L_{50} and 70 dBA L_{max} during nighttime (10:00 PM to 7:00 AM) hours.

Based on the evaluation conducted in the Environmental Noise Assessment, the proposed project is predicted to comply with the City's daytime and nighttime (10:00 PM to 7:00 AM) L_{50} noise level standards. However, as presented in Figure 6, the project would exceed the City's nighttime L_{max} standard of 70 dBA. Therefore, impacts resulting from operational noise would be considered potentially significant and mitigation would be required.

Conclusion

Based on the above, a potentially significant impact could occur. However, with implementation of Mitigation Measure 9-1, the ***effect can be mitigated to less than significant***.

Question C

During the construction phase of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Construction at the project site would include site grading, clearing and excavation work associated with site preparation. The on-site equipment required for construction activities are expected to include excavators, graders, haul trucks, and a crane, among other construction equipment. Table 7 shows that project construction would result in the generation of noise levels ranging from 76 to 90 dB at a distance of 50 feet.

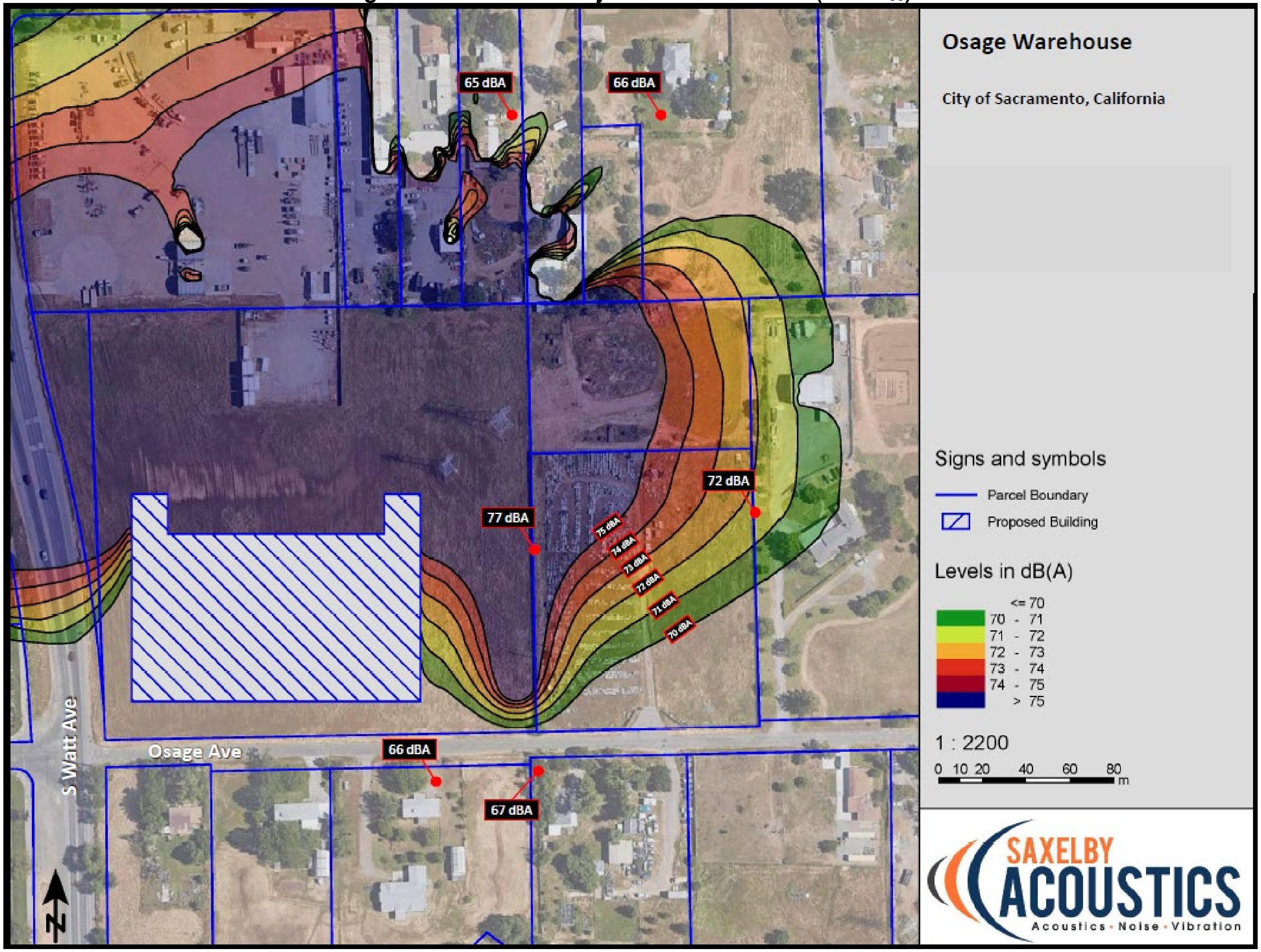
Table 7
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.

The noise increase during construction would be of short duration and would likely occur primarily during daytime hours. The City of Sacramento's Noise Ordinance of the Municipal Code exempts construction activities from the noise standards, provided that construction takes place between the hours of 7:00 AM and 6:00 PM Monday through Saturday and 9:00 AM and 6:00 PM Sundays and holidays.

Figure 8
Nighttime Maximum Project Noise Contours (dBA L_{50})



Although the construction activities could result in infrequent periods of high noise, the construction noise would not be sustained and would only occur only during the City's permitted construction noise hours.

Because the proposed project would be required to adhere to the City's Noise Ordinance and the increase in noise levels from construction activities would be temporary, noise levels associated with construction of the proposed project would not result in construction noise levels that exceed the standards in the City of Sacramento General Plan or Noise Ordinance. Therefore, implementation of proposed project would have ***no additional significant environmental effect*** related to construction noise beyond what was previously evaluated in the Master EIR.

Question D

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

For structural damage, the California Department of Transportation (Caltrans) uses a vibration limit of 0.5 inches/second, peak particle velocity (in/sec ppv), for buildings structurally sound and designed to modern engineering standards; 0.2 in/sec ppv for buildings that are found to be structurally sound but where structural damage is a major concern; and a conservative limit of 0.08 in/sec ppv for ancient buildings or buildings that are documented to be structurally weakened.[18] Accordingly, the City uses a threshold of significance for vibration levels of 0.5 in/sec ppv for residential and commercial areas, and 0.2 in/sec ppv for historic buildings and archaeological sites.

Both project construction and operations are analyzed below for potential impacts related to vibration.

Vibration Generated by Project Construction Activities

During project construction heavy equipment would be used for grading excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. As shown in Table 8, with the exception of vibratory compactors, construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distance of 25 feet. As noted previously, the nearest sensitive receptor in the vicinity of the project site is located approximately 80 feet south of the project site, across Osage Avenue. Therefore, vibration levels at the nearest receptor would be less than the 0.2 in/sec threshold of significance.

Table 8
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (inches/second)	PPV at 50 feet (inches/second)	PPV at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

18 California Department of Transportation. *Transportation and Construction Vibration Guidance Manual*. September 2013.

Vibration Generated by On-Site Project Operations

The proposed project would include operations involving delivery truck loading and unloading activities, mechanical equipment, and delivery truck circulation. Such activities would not generate appreciable vibration, either from loading and unloading activity or from the use of mechanical equipment. Furthermore, the proposed project would not include the use of any known stationary equipment that would result in appreciable vibrations. Accordingly, impacts related to vibrations during project operations would be less than significant.

Conclusion

Based on the above, ***no additional environmental effect*** would occur related to exposing existing and/or planned residential and commercial areas to vibration peak particle velocities greater than 0.5 inches per second due to project construction or operations.

Questions E and F

The proposed project would not generate an increase in highway traffic or rail operations sufficient to expose adjacent residential areas to vibration levels greater than 0.5 in/sec PPV. In addition, the project site is not located in the vicinity of historic buildings or archaeological sites that could be affected by construction-related vibration. Therefore, ***no additional significant environmental effect*** would occur related to exposing residential or commercial areas to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic or rail operations, or related to exposing historic buildings and archaeological sites to vibration peak particle velocities greater than 0.2 inches per second due to project construction and highway traffic.

MITIGATION MEASURES

Implementation of the following mitigation measures would reduce impacts related to noise to a *less-than-significant* level.

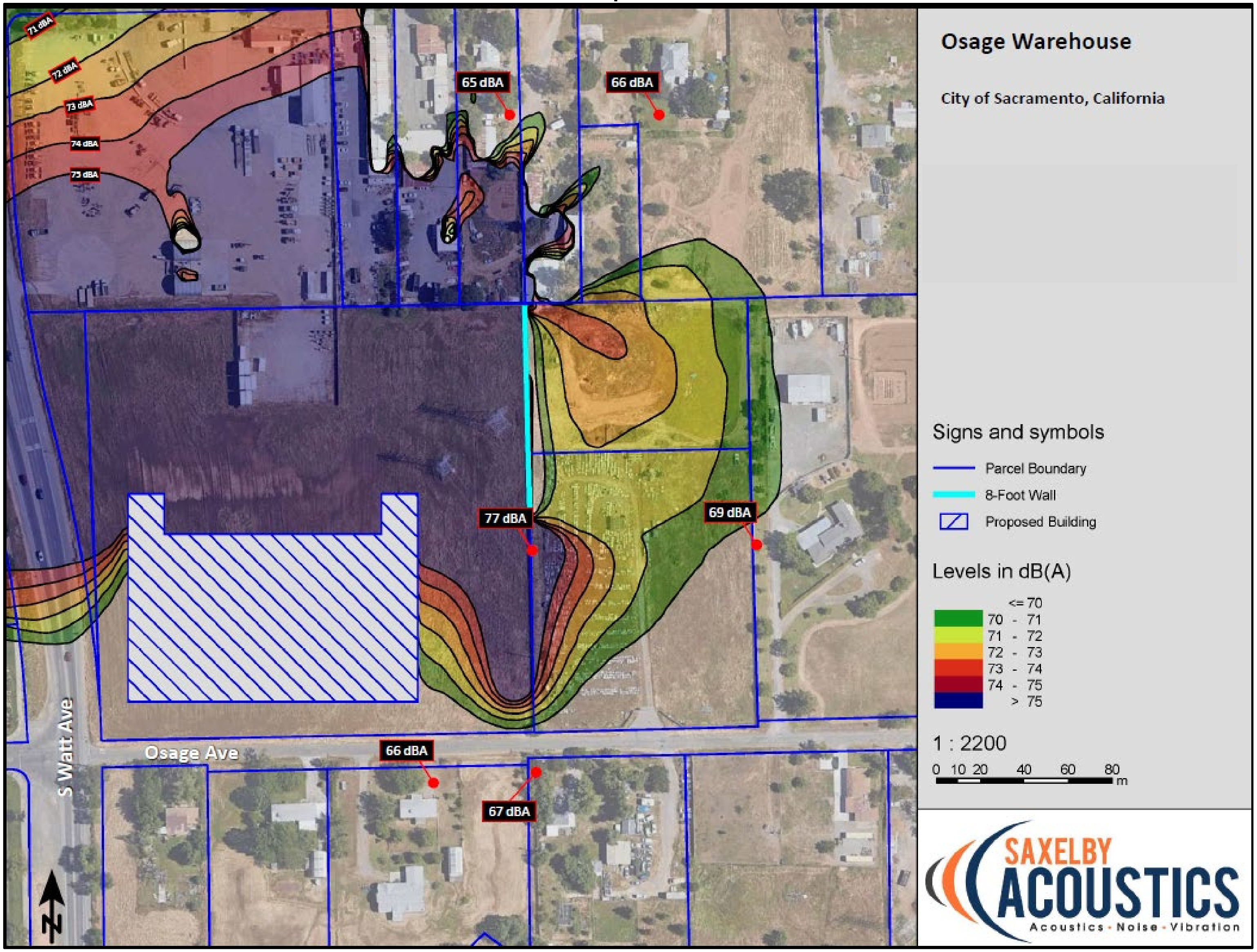
9-1 ***Construction of Sound Wall***

An eight-foot-tall sound wall shall be constructed along the eastern project boundary in order to achieve the City's exterior noise standards. Refer to Figure 9 for required location. The noise barrier wall shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials that achieve the required total height. These requirements shall be included in the improvements plans prior to approval by the City's Public Works Department.

FINDINGS

All additional significant environmental effects of the project relating to noise can be mitigated to a less-than-significant level.

Figure 9
Location of Proposed Sound Wall



Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
10. PUBLIC SERVICES Would the project: A) Would the project result in the need for new or altered services related to fire protection, police protection, school facilities, or other governmental services beyond what was anticipated in the 2035 General Plan?			X

ENVIRONMENTAL SETTING

The Sacramento Fire Department (SFD) provides fire protection and emergency services to the entire City and some small areas just outside the City boundaries within the County limits. The SFD serves a population of over 738,000 in a 358 square mile service area. The SFD has approximately 155 on-duty personnel working daily to serve the City.[19] The project site is located within the response zone of Fire Station 60.

The Sacramento City Police Department (SPD) provides police protection services to the project area, which is located within Sacramento Police District 6C. The SPD uses a variety of data that includes Geographic Information Systems (GIS) based data, call and crime frequency information, and available personnel to rebalance the deployment of resources on an annual basis to meet the changing demands of the City. In addition to the SPD, the Sacramento County Sheriff's Department, California Highway Patrol (CHP), UC Davis Medical Center Police Department, and the Regional Transit Police Department aid the SPD to provide protection for the City.

The project site is located within the Elk Grove Unified School District. However, it is noted that the proposed project is non-residential.

The City of Sacramento Department of Youth, Parks and Community Enrichment (Department of YPCE) oversees more than 4,255.5 acres of parkland and manages more than 223 parks within the City.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, an impact would be considered significant if the project resulted in the need for new or altered services related to fire protection, police protection, school facilities, or other governmental services beyond what was anticipated in the 2035 General Plan.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the potential effects of the 2035 General Plan on various public services. Police, fire protection, schools, libraries, and emergency services were evaluated in Chapter 4.10 of the Master EIR.

The General Plan provides that adequate staffing levels for police and fire are important for the long-term health, safety and well-being of the community (Goal PHS 1.1, PHS 2.1). The Master EIR concluded that effects of development that could occur under the General Plan would be less than significant.

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19 Metro Fire Sacramento. *About Us*. Available at: https://metrofire.ca.gov/about-us. Accessed August 2021.

General Plan policies that call for the City to consider impacts of new development on schools (see, for example, Policy ERC 1.1.2 setting forth locational criteria, and Policy ERC 1.1.4 that encourages joint-use development of facilities) reduce impacts on schools to a less-than-significant level (Impacts 4.10-3 and4.10-4). Impacts on library facilities were considered less than significant (Impact 4.10-5).

ANSWERS TO CHECKLIST QUESTIONS

Question A

The proposed project would involve the development of a 115,468-sf warehouse. The following discussion pertains to the existing fire, police, and school facilities, as well as the proposed project's impacts related to such facilities and services.

Fire Protection

The closest fire station to the project site is SFD Station 60, located at 3301 Julliard Drive, approximately 2.1 miles northwest of the project site. As stated in the Master EIR, the goal of the SFD is to have fire suppression and paramedic services arrive at the scene within four minutes. Considering the proximity of the project site to Station 60, it is reasonable to assume that response times from the SFD would meet the four-minute response time goal.

As previously mentioned, the proposed project is consistent with the land use designation for the site in the Sacramento General Plan. Therefore, any increase in demand for fire protection associated with development of the project site with industrial uses has already been evaluated in the Master EIR and accounted for in City planning efforts. In addition, as the proposed project is non-residential, the project would not include the development of residential units that would directly increase population in the service area of the SFD. The project applicant would be required to incorporate design features such as sprinkler systems, adequate fire flow and flow duration, fire resistance rated construction materials, portable fire extinguishers, fire alarm and detection systems, smoke control systems, lighted exit signs, fire doors, to comply with the most current California Fire Code regulations. Within the General Plan, Policy PHS 2.1.11 states that the City shall require development projects to contribute fees for fire protection services and facilities. As a result of Policy PHS 2.1.11, the project would be required to pay applicable development fees financially supporting the SFD. Considering that the project site's proximity of the site to Station 60, consistency with the General Plan, and the required payment of fees, the proposed project would not result in the need for new or altered services related to fire protection and a less-than-significant impact would occur.

Police Protection

According to the Master EIR, as buildout of the General Plan occurs, the SPD would need new, decentralized facilities that would be required to maintain adequate response times. Currently, the SPD averages an eight minute and five second response time for Priority 2 calls.

The SPD provides law enforcement protection to the project site, with the nearest SPD station to the project site located at 5303 Franklin Boulevard, approximately 5.6 miles west of the project site. According to the Master EIR, the SPD currently has adequate staffing and response times to serve new development that is consistent with the buildout anticipated in the EIR, including the proposed project. Additionally, the project applicant would be required to pay development fees for City law enforcement services. Thus, the project would not substantially increase the need for police services beyond what has been previously anticipated in the 2035 General Plan and analyzed in the Master EIR.

Schools and Other Public Services

The City is served by six school districts providing public elementary, middle school, and high school opportunities. The school districts include the Sacramento City Unified School District, Twin Rivers Unified School District, Robla School District, Natomas Unified School District, and the Elk Grove Unified School

District. The proposed project is within the Elk Grove Unified School District. However, the proposed project in non-residential and would not directly generate any additional students in the area. In addition, buildout of the project site with the proposed warehouse uses has been previously anticipated per the 2035 General Plan and associated demand for government services was analyzed in the Master EIR. Furthermore, the proposed project would be subject to payment of school impact fees. The school impact fees are used to fund the construction or reconstruction of school facilities within the district for which the fees are collected. With regard to other government services and public facilities, the proposed project would also be subject to the City's park impact fee per Section 18.56.220 of the Municipal Code. With payment of applicable development impact fees, the proposed project would not result in additional demand for school services or other government services beyond what has been anticipated for the site in the Master EIR.

Conclusion

As noted above, the applicant would be required to pay all of the required development fees to the appropriate public services departments. In addition, the proposed project is not anticipated to generate increased demand for any public services such that the demand could not be met by existing facilities. Therefore, implementation of proposed project would have ***no additional significant environmental effect*** beyond what was previously evaluated in the Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Public Services.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
11. RECREATION Would the project: A) Cause or accelerate substantial physical deterioration of existing area parks or recreational facilities?			X
B) Create a need for construction or expansion of recreational facilities beyond what was anticipated in the 2035 General Plan?			X

ENVIRONMENTAL SETTING

Natural resources and parks provide a wide range of recreational opportunities for residents in the vicinity of the project site. The City currently contains 230 developed and undeveloped park sites, 88 miles of off-street bikeways and trails, 21 lakes/ponds or beaches, over 20 aquatic facilities, and extensive recreation facilities in the City parks. With the inclusion of the City's golf courses (633 acres) and Camp Sacramento, which is located in El Dorado County (19 acres), the City's parkland total is approximately 4,829 acres. The proposed project is adjacent to various recreational and park facilities. Pursuant to Section 18.56.220 of the Sacramento Municipal Code, a park impact fee is imposed on non-residential developments.

STANDARDS OF SIGNIFICANCE

For purposes of this Initial Study, impacts to recreational resources are considered significant if the proposed project would do either of the following:

- Cause or accelerate substantial physical deterioration of existing area parks or recreational facilities; or
- Create a need for construction or expansion of recreational facilities beyond what was anticipated in the 2035 General Plan.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Chapter 4.9 of the Master EIR considered the effects of the 2035 General Plan on the City's existing parkland, urban forest, recreational facilities and recreational services. The General Plan identified a goal of providing an integrated park and recreation system in the City (Goal ERC 2.1). New residential development would be required to dedicate land, pay in-lieu fees or otherwise contribute a fair share to the acquisition and development of parks and recreation facilities (Policy ERC 2.2.5). Impacts were considered less than significant after application of the applicable policies. (Impacts 4.9-1 and 4.9-2).

ANSWERS TO CHECKLIST QUESTIONS

Questions A and B

The proposed project would include the construction of a 115,468-sf warehouse. As the proposed project is non-residential, it would neither induce population growth nor increase strain upon existing recreational facilities and parks. In accordance with Section 18.56.220 of the Municipal Code, a park impact fee is imposed on non-residential developments. Payment of the fee would provide funding for future parks and park improvements, and would ensure that a less-than-significant impact occurs.

Based on the above, given the project consistency with the City's General Plan, and the required payment of the park development impact fee, implementation of the proposed project would result in ***no additional environmental effect*** related to recreation beyond what was analyzed in the 2035 Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Recreation.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
12. <u>TRANSPORTATION AND CIRCULATION</u> Would the project: A) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities?			X
B) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?			X
C) Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X
D) Result in inadequate emergency access?			X

ENVIRONMENTAL SETTING

The following section is based on information from the City of Sacramento 2035 General Plan, the 2035 Master EIR, the Focused Transportation Analysis,[20] and the VMT Analysis[21] prepared for the proposed project.

Roadways in the project vicinity include South Watt Avenue, Osage Avenue, Fruitridge Road, and Elder Creek Road.

South Watt Avenue is a north-south arterial that extends to Folsom Boulevard to the north, where South Watt Avenue becomes Watt Avenue. Watt Avenue provides access to US 50 and extends northerly across the American River. South Watt Avenue is one lane in both directions south of the intersection with Osage Avenue, but the northbound lane splits into two lanes north of the intersection. The two southbound lanes of South Watt Avenue merge into one lane between the intersections with Fruitridge Road and Osage Avenue. South Watt Avenue has one sidewalk on the west side of the road, where it is separated from the road by a grass median that is directly adjacent to the road.

Osage Avenue is an east-west local street, beginning approximately 600 feet west of South Watt Avenue at a gated entry to an industrial/commercial complex. To the east, Osage Avenue extends approximately 2,000 feet east of South Watt Avenue to a T-intersection at Hedge Avenue. Osage Avenue is stop-sign controlled at South Watt Avenue and at Hedge Avenue. West of South Watt Avenue, Osage Avenue has been improved with 40 feet of pavement and sidewalks on both sides. East of South Watt Avenue, Osage Avenue is typically 16 to 20 feet wide, without shoulders or sidewalks. The pavement east of Osage Avenue is in poor to fair condition. Osage Avenue, along the south boundary of the project site, does not include roadway striping nor provide pedestrian or bicycle facilities.

The nearest major roadways to the project site are Highways 16 and 50, which both intersect South Watt Avenue approximate one mile and 2.5 miles north of the project site, respectively.

Public transit service in the region is provided by Sacramento Regional Transit (RT). However, transit service is not offered within the project vicinity. RT's Gold Line Light Rail service is located about 2.2 miles

20 DKS Associates. *8981 Osage Warehouse Focused Transportation Analysis.* December 9, 2021.
21 DKS Associates. *8981 Osage Avenue Warehouse VMT Analysis.* December 9, 2021.

north of the project site. Bus Route 61 (Fruitridge) operates along Fruitridge Road and Florin Perkins Road about 1.4 miles northwest of the project site.

STANDARDS OF SIGNIFICANCE

Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts, with other relevant considerations consisting of the effects of the project on transit and non-motorized travel. VMT is the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT measures the full distance of personal motorized vehicle-trips, with one end within the project site.

Based on current practice of the City of Sacramento, transportation impacts are considered significant if the proposed project would result in a VMT per capita or office VMT per employee above 85 percent of the regional average, consistent with technical guidance published by the Governor's Office of Planning and Research (OPR). However, the OPR guidance does not specify a particular significance threshold for industrial employment and recommends that local jurisdictions determine the threshold based on local conditions. Some jurisdictions in the Sacramento region (including Sacramento County and the City of Rancho Cordova) have determined that the significance threshold for industrial employment is 100 percent of the regional average. The draft City of Sacramento's Transportation Impact Analysis Guidelines do not specify a significance threshold for industrial land uses. For consistency with nearby jurisdictions, this Initial Study applies the significance threshold of 100 percent of regional average for industrial uses.

Several screening thresholds are used to quickly determine whether a project may be presumed to have a less-than-significant VMT impact without conducting a detailed project generated VMT analysis. Screening criteria includes:

1. Small Projects – projects that generate or attract fewer than 110 trips per day;
2. Map-Based Screening – projects located in areas that are known to generate below-average VMT;
3. Near Transit Stations – projects within 0.5-mile of an existing major transit stop or an existing stop along a high-quality transit corridor; or
4. Affordable Residential Development – projects that include affordable housing within an infill location.

Lastly, for purposes of this Initial Study, impacts resulting from changes in transportation or circulation may be considered significant if construction and/or implementation of the proposed project would result in the following impacts that remain significant after implementation of General Plan policies or mitigation from the Master EIR:

Transit

- Adversely affect public transit operations; or
- Fail to adequately provide for access to public transit.

Bicycle Facilities

- Adversely affect bicycle travel, bicycle paths; or
- Fail to adequately provide for access by bicycle.

Pedestrian Circulation

- Adversely affect pedestrian travel, pedestrian paths; or
- Fail to adequately provide for access by pedestrians.

Construction-Related Traffic Impacts

- Degrade an intersection or roadway to an unacceptable level;
- Cause inconveniences to motorists due to prolonged road closures; or
- Result in an increased frequency of potential conflicts between vehicles, pedestrians, and bicyclists.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

Transportation and circulation were discussed in the Master EIR in Chapter 4.12. Various modes of travel were included in the analysis, including vehicular, transit, bicycle, pedestrian and aviation components. Provisions of the 2035 General Plan that provide substantial guidance include Mobility Goal 1.1, calling for a transportation system that is effectively planned, managed, operated and maintained, promotion of multimodal choices (Policy M 1.2.1), support for state highway expansion and management consistent with the Sacramento Area Council of Governments Metropolitan Transportation Plan/Sustainable Communities Strategy (SACOG MTP/SCS) (Policy M 1.5.6) and development that encourages walking and biking (Policy LU 4.2.1).

While the General Plan includes numerous policies that direct the development of the City's transportation system, the Master EIR concluded that the General Plan development would result in significant and unavoidable effects. See Impacts 4.12-3 (roadway segments in adjacent communities) and Impact 4.12-4 (freeway segments).

ANSWERS TO CHECKLIST QUESTIONS

Question A

The following analysis provides a summary of the project trip generation and distribution, and impacts to transit, bicycle, and pedestrian facilities.

Project Trip Generation and Distribution

Table 9 summarizes the recommended trip generation estimates used for the transportation analysis prepared for the project by DKS Associates.

Table 9
Vehicular Trip Generation Estimates

Size (1,000 sf)	Vehicle	Vehicle Trips Generated (Trip-Ends)						
			AM Peak Hour			PM Peak Hour		
		Week-day	Enter	Exit	Total	Enter	Exit	Total
136.72	Trucks	62	2	2	4	2	2	4
	Total	***717***	***71***	***22***	***22***	***93***	***31***	***101***

Source: DKS Associates, 2021.

Transit, Bicycle, and Pedestrian Facilities

According to the Focused Transportation Analysis, the proposed project would potentially cause impacts to transit, bicycle facilities, and pedestrian facilities. However, the Focused Transportation Analysis concludes that such impacts would not be significant because the project would not adversely affect transit operations, would not modify, or impede any existing or planned transit facilities or routes, would not modify existing or planned bicycle facilities. Furthermore, the proposed project would include improved sidewalks along the site frontage and pedestrian crosswalks at the intersection of Osage Avenue and South Watt Avenue, which would improve pedestrian access. The proposed project would also include short-term and long-term bike parking on-site.

Conclusion

Based on the above, the proposed project would not conflict with a program, plan, ordinance, or policy address the circulation system, including transit, roadway, bicycle, and pedestrian facilities, and ***no additional environmental effect*** would occur.

Question B

A VMT Technical Memorandum was prepared for the proposed project by DKS Associates.[22] Pursuant to SB 743 and technical guidance published by OPR, several screening procedures exist to streamline project analysis related to VMT. The VMT Technical Memorandum determined that the proposed project qualifies for screening based on SACOG's hexagon methodology, in which maps created with VMT data can illustrate areas that are currently below threshold VMT. Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out projects from needing to prepare a detailed VMT analysis. For employment-based projects, the applicable threshold of significance is whether the proposed project would exceed 100 percent of the regional average VMT per employee.

The proposed project's estimated VMT per employee was determined using the VMT employment screening map, which is derived from the traffic analysis zone results from SACOG's regional travel forecasting model system. The maps use hexagonal shaped geographic areas (HEX) to establish a uniform grid of employment-based VMT per capita by tallying all household VMT's generated by employees within the HEX and dividing by the total employees in the HEX. The proposed project falls within a HEX estimated to produce 95.1 percent of the Regional Average, which is less than the applicable threshold of significance. As a result, VMT associated with the proposed project is considered to be less-than-significant.

Based on the above, the proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), and implementation of the proposed project would result in ***no additional environmental effects*** beyond what was analyzed in the 2035 Master EIR.

Question C

Access to the site would be provided by two driveways from Osage Avenue. Internal circulation would be provided by a parking lot on the east side of the building and a long driveway along the eastern project boundary which would provide access to the docks and turnaround area. The driveway would connect to the parking lot near the northeastern corner of the parking lot. As discussed under Question A, the existing Osage Avenue pavement width and condition is unsuitable for access to an industrial facility. However, this would be addressed with implementation of the condition of approval presented above.

Based on the above, the proposed project would not redesign, alter, or modify existing public roadways in the project vicinity. As such, the project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), and implementation of the project would result in ***no additional environmental effects*** beyond what was analyzed in the 2035 Master EIR.

Question D

The proposed project would be required to comply with all building, fire, and safety codes and specific development plans would be subject to review and approval by the City's Public Works Department and the SFD. Required review by the aforementioned departments would ensure that the proposed circulation system for the project site would provide adequate emergency access. The proposed project would not alter the circulation network of the other local roadways or otherwise prevent emergency vehicle access or evacuation. Furthermore, the two access driveways would allow for adequate emergency access. In addition, Section 12.20.030 of the City's Municipal Code requires that a construction traffic control plan be prepared and

[22] DKS Associates. *8981 Osage Avenue Warehouse VMT Analysis.* December 9, 2021.

approved prior to the beginning of project construction, to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies. All work performed during construction must conform to the conditions and requirements of the approved plan. The plan would ensure that safe and efficient movement of traffic through the construction work zone(s) is maintained. At a minimum, the plan must include the following:

- Time and day of street closures;
- Proper advance warning and posted signage regarding street closures;
- Provision of driveway access plan to ensure safe vehicular, pedestrian, and bicycle movements;
- Safe and efficient access routes for emergency vehicles;
- Provisions for pedestrian safety;
- Use of manual traffic control when necessary;
- Number of anticipated truck trips, and time of day of arrival and departure of trucks;
- Provision of a truck circulation pattern and staging area with a limitation on the number of trucks that can be waiting and any limitations on the size and type of trucks appropriate for the surrounding transportation network; and
- The plan must be available at the site for inspection by the City representative during all work.

With implementation of the aforementioned traffic control plan, local roadways and freeway facilities would continue to operate at acceptable operating conditions during construction, and the proposed project would not result in inadequate emergency access to the project site. Therefore, the implementation of the project would result in ***no additional environmental effects*** beyond what was analyzed in the 2035 Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Transportation and Circulation.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
13. TRIBAL CULTURAL RESOURCES Would the project: A) Cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources code section 5020.1(k) or		X	
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X	

ENVIRONMENTAL AND REGULATORY SETTING

Please reference the Cultural Resources Chapter for the Ethnohistory of the historic indigenous groups that occupied the region. This section focuses on the contemporary tribal communities and tribal cultural resources as they pertain to AB52.

This section analyzes and evaluates the potential impacts of the project on Tribal cultural resources, both identified and undiscovered. Tribal cultural resources, as defined by Assembly Bill (AB) 52, Statutes of 2014, in Public Resources Code (PRC) Section 21074, are sites, features, places, cultural landscapes, sacred places and objects, with cultural value to a Tribe. A Tribal cultural landscape is defined as a geographic area (including both cultural and natural resources and the wildlife therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

The unanticipated find of Native American human remains would also be considered a Tribal cultural resource, and are therefore analyzed in this section.

The proposed project area is situated within the lands traditionally occupied by the Valley Nisenan, or Southern Maidu. Many descendants of Valley Nisenan throughout the larger Sacramento region belong to the United Auburn Indian Community, Shingle Springs, Ione Band, Colfax-Todds Valley, and Wilton Rancheria Tribes. The Tribes actively participate in the identification, evaluation, preservation, and restoration of Tribal Cultural Resources.

Data Sources and Methodology

Under PRC Section 21080.3.1 and 21082.3, the City must consult with tribes traditionally and culturally affiliated with the project area that have requested formal notification and responded with a request for consultation. The parties must consult in good faith. Consultation is deemed concluded when the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource when one is present or when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed on during the consultation process must be recommended for inclusion in the environmental document.

A search of the Sacred Lands File was requested from the NAHC, and a response was received on August 30, 2021 indicating that Sacred Sites have been identified within the project vicinity.[23] Pursuant to AB 52, project notification letters were distributed to the appropriate tribes on September 30, 2021. No response was received from Wilton Rancheria or Shingle Springs Band of Miwok Indians. On October 25, 2021 an email was received declining consultation from Buena Vista Rancheria. United Auburn Indian Community (UAIC) responded on October 6, 2021.

In response to the City's notification of the project to UAIC, UAIC conducted a records search for the identification of Tribal Cultural Resources for this project which included a review of pertinent literature and historic maps, and a records search using UAIC's Tribal Historic Information System (THRIS). UAIC's THRIS database is composed of UAIC's areas of oral history, ethnographic history, and places of cultural and religious significance, including UAIC Sacred Lands that are submitted to the Native American Heritage Commission (NAHC). The THRIS resources shown in this region also include previously recorded indigenous resources identified through the California Historic Resources Information System Center (CHRIS) as well as historic resources and survey data. For the subject project UAIC requested inadvertent discoveries mitigation be included then agreed no consultation was necessary.

Federal Regulations

Federal plans, policies, or regulations related to tribal cultural resources that are directly applicable to the proposed project do not exist. However, Section 106 of the National Historic Preservation Act does require consultation with Native Americans to identify and consider certain types of cultural resources. Cultural resources of Native American origin identified as a result of the identification efforts conducted under Section 106 may also qualify as tribal cultural resources under CEQA.

State Regulations

- **California Environmental Quality Act:** CEQA requires that public agencies that finance or approve public or private projects must assess the effects of the project on tribal cultural resources. Tribal cultural resources are defined in PRC 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is (1) listed or determined eligible for listing on the California Register of Historical Resources (CRHR) or a local register, or (2) that are determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.
- **California PRC Section 5024:** PRC Section 5024.1 establishes the CRHR, which is the authoritative guide for identifying the State's historical resources to indicate what properties are to be protected, if feasible, from substantial adverse change. For a resource to be eligible for the CRHR, it must be more than 50 years old, retain its historic integrity, and satisfy one or more of the following criteria:

23 Native American Heritage Commission. *Re: Osage Warehouse Project, Sacramento County.* August 30, 2021.

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, a tribal cultural resource is considered to be a significant resource if the resource is: 1) listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources; or 2) the resource has been determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. For purposes of this Initial Study, impacts on tribal cultural resources may be considered significant if construction and/or implementation of the proposed project would result in the following:

- Cause a substantial change in the significance of a tribal cultural resource as defined in Public Resources Code 21074.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the potential effects of development under the 2035 General Plan on prehistoric and historic resources (see Master EIR Chapter 4.4 and Appendix C – Background Report, B. Cultural Resources Appendix), but did not specifically address tribal cultural resources because that resource type had not yet been defined in CEQA at the time the Master EIR was adopted. The Master EIR identified significant and unavoidable effects on historic resources and archaeological resources, some of which could be tribal cultural resources as defined PRC Section 21074. Ground-disturbing activities resulting from implementation of development under the 2035 General Plan could affect the integrity of an archaeological site (which may be a tribal cultural resource), thereby causing a substantial change in the significance of the resource. General plan policies identified as reducing such effects on cultural resources that may also be tribal cultural resources include identification of resources on project sites (Policy HCR 2.1.1); implementation of applicable laws and regulations (Policy HCR 2.1.2); consultation with appropriate organizations and individuals including the Native American Heritage Commission and implementation of their consultation guidelines (Policy HCR 2.1.3); enforcement programs to promote the maintenance, rehabilitation, preservation, and interpretation of the City's historic resources (Policy HCR 2.1.4); listing of qualified historic resources under appropriate national, State, and local registers (Policy HCR 2.1.5); consideration of historic and cultural resources in planning studies (Policy HCR 2.1.6); enforcement of compliance with local, State, and federal historic and cultural preservation requirements (Policy HCR 2.1.8); and early consultation with owners and land developers to minimize effects (Policy HCR 2.1.10).

Of particular relevance to this project are policies that ensure compliance with protocol that protect or mitigate impacts to archaeological resources (Policy HCR 2.1.16) and that encourage preservation and minimization of impacts on cultural resources (Policy HCR 2.1.17).

ANSWERS TO CHECKLIST QUESTIONS

Questions A)i and A)ii

As discussed in Section 4, Cultural Resources, of this Initial Study, the NAHC search of their Sacred Lands File indicated that sacred sites and/or tribal cultural resources have been identified within the project vicinity. However, known tribal cultural resources have not been identified on the project site. Subsurface tribal cultural resources have the potential to be found on-site during grading and construction activities. Due to the predominant historic theme of the region as a whole, which includes thousands of years of occupation by

Native American groups prior to non-Native peoples settling in the region, the possibility exists that unknown resources could be encountered during grading and excavation activities associated with development of the project. Therefore, the proposed project could have a potentially significant impact related to damaging or destroying prehistoric cultural resources. However, with implementation of Mitigation Measures 13-1 through 13-3, the ***effect can be mitigated to less than significant***.

MITIGATION MEASURES

Implementation of the following mitigation measures would reduce impacts related to tribal cultural resources to a *less-than-significant* level.

13-1 ***Conduct Cultural Resources Sensitivity and Awareness Training Prior to Ground-Disturbing Activities***

The City shall require the applicant/contractor to provide a tribal cultural resources sensitivity and awareness training program (Worker Environmental Awareness Program [WEAP]) for all personnel involved in project construction, including field consultants and construction workers. The WEAP will be developed in coordination with culturally affiliated Native American tribes. T The WEAP shall be conducted before any project-related construction activities begin at the project site. The WEAP will include relevant information regarding sensitive tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations.

The WEAP will also describe appropriate avoidance and impact minimization measures for tribal cultural resources that could be located at the project site and will outline what to do and who to contact if any potential tribal cultural resources are encountered. The WEAP will emphasize the requirement for confidentiality and culturally appropriate treatment of any discovery of significance to Native Americans and will discuss appropriate behaviors and responsive actions, consistent with Native American tribal values.

13-2 ***In the Event that Tribal Cultural Resources are Discovered During Construction, Implement Procedures to Evaluate Tribal Cultural Resources and Implement Avoidance and Minimization Measures to Avoid Significant Impact.***

If tribal cultural resources (such as structural features, unusual amounts of bone or shell, artifacts, or human remains) are encountered at the project site during construction, work shall be suspended within 100 feet of the find (based on the apparent distribution of cultural materials), and the construction contractor shall immediately notify the project's City representative. Avoidance and preservation in place is the preferred manner of mitigating impacts to tribal cultural resources. This will be accomplished, if feasible, by several alternative means, including:

- *Planning construction to avoid tribal cultural resources, archaeological sites and/or other cultural resources; incorporating cultural resources within parks, green-space or other open space; covering archaeological resources; deeding a cultural resource to a permanent conservation easement; or other preservation and protection methods agreeable to consulting parties and regulatory authorities with jurisdiction over the activity.*

- *Recommendations for avoidance of tribal cultural resources will be reviewed by the City representative, interested culturally affiliated Native American tribes and other appropriate agencies, in light of factors such as costs, logistics, feasibility, design, technology and social, cultural and environmental considerations, and the extent to which avoidance is consistent with project objectives. Avoidance and design alternatives may include realignment within the project site to avoid tribal cultural* *resources, modification of the design to eliminate or reduce impacts to tribal cultural resources or modification or realignment to avoid highly significant features within a cultural resource or tribal cultural resource.*

- *Native American representatives from interested culturally affiliated Native American tribes will be notified to review and comment on these analyses and shall have the opportunity to meet with the City representative and its representatives who have technical expertise to identify and recommend feasible avoidance and design alternatives, so that appropriate and feasible avoidance and design alternatives can be identified.*

- *If the discovered tribal cultural resource can be avoided, the construction contractor(s), will install protective fencing outside the site boundary, including a 100-foot buffer area, before construction restarts. The boundary of a a tribal cultural resource will be determined in consultation with interested culturally affiliated Native American tribes and tribes will be notified to monitor the installation of fencing. Use of temporary and permanent forms of protective fencing will be determined in consultation with Native American representatives from interested culturally affiliated Native American tribes.*

- *The construction contractor(s) will maintain the protective fencing throughout construction to avoid the site during all remaining phases of construction. The area will be demarcated as an "Environmentally Sensitive Area".*

If a tribal cultural resource cannot be avoided, the following performance standard shall be met prior to continuance of construction and associated activities that may result in damage to or destruction of tribal cultural resources:

- *Each resource will be evaluated for California Register of Historical Resources-(CRHR) eligibility through application of established eligibility criteria (California Code of Regulations 15064.636), in consultation with consulting Native American Tribes, as applicable.*

If a tribal cultural resource is determined to be eligible for listing in the CRHR, the City will avoid damaging effects to the resource in accordance with California PRC Section 21084.3, if feasible. The City shall coordinate the investigation of the find with a qualified archaeologist (meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology) approved by the City and with interested culturally affiliated Native American tribes that respond to the City's notification. As part of the site investigation and resource assessment, the City and the archaeologist shall consult with interested culturally affiliated Native American tribes to assess the significance of the find, make recommendations for further evaluation and treatment as necessary and provide proper management recommendations should potential impacts to the resources be determined by the City to be significant. A written report detailing the site assessment, coordination activities, and management recommendations shall be provided to the City representative by the qualified archaeologist. These recommendations will be documented in the project record. For any recommendations made by interested culturally affiliated Native American tribes that are not implemented, a justification for why the recommendation was not followed will be provided in the project record.

Native American representatives from interested culturally affiliated Native American Tribes and the City representative will also consult to develop measures for long-term management of any discovered tribal cultural resources. Consultation will be limited to actions consistent with the jurisdiction of the City and taking into account ownership of the subject property. To the extent that the City has jurisdiction, routine operation and maintenance within tribal cultural resources retaining tribal cultural integrity shall be *consistent with the avoidance and minimization standards identified in this mitigation measure.*

If the City determines that the project may cause a significant impact to a tribal cultural resource, and measures are not otherwise identified in the consultation process, the following are examples of mitigation capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to the resource. These measures may be considered to avoid or minimize significant adverse impacts and constitute the standard by which an impact conclusion of less-than significant may be reached:

- *Avoid and preserve resources in place, including, but not limited to, planning construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.*
- *Treat the resource with culturally appropriate dignity taking into account the Tribal cultural values and meaning of the resource, including, but not limited to, the following:*
    - *Protect the cultural character and integrity of the resource.*
    - *Protect the traditional use of the resource.*
    - *Protect the confidentiality of the resource.*
    - *Establish permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places.*
    - *Rebury the resource in place.*
    - *Protect the resource.*

13-3 ***Implement Procedures in the Event of the Inadvertent Discovery of Native American Human Remains.***

Implement Procedures in the Event of the Inadvertent Discovery of Human Remains. If an inadvertent discovery of human remains is made at any time during project-related construction activities or project planning, the City the following performance standards shall be met prior to implementing or continuing actions such as construction, which may result in damage to or destruction of human remains. In accordance with the California Health and Safety Code (HSC), if human remains are encountered during ground-disturbing activities, the City shall immediately halt potentially damaging excavation in the area of the remains and notify the Sacramento County Coroner and a professional archaeologist to determine the nature of the remains. The Coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (HSC Section 7050.5[b]).

If the human remains are of historic age and are determined to be not of Native American origin, the City will follow the provisions of the HSC Section 7000 (et seq.) regarding the disinterment and removal of non-Native American human remains.

If the Coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (HSC Section 7050[c]). After the Coroner’s findings have been made, the archaeologist and the NAHC-designated Most Likely Descendant (MLD), in consultation with the landowner, shall determine the ultimate treatment and disposition of the remains. The responsibilities of the City for acting upon notification of a discovery of Native American human remains are identified in California PRC Section 5097.9 et seq.

FINDINGS

All additional significant environmental effects of the project relating to tribal cultural resources can be mitigated to a less-than-significant level.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
14. UTILITIES AND SERVICE SYSTEMS Would the project: A) Result in the determination that adequate capacity is not available to serve the project's demand in addition to existing commitments?			X
B) Require or result in either the construction of new utilities or the expansion of existing utilities, the construction of which could cause significant environmental impacts?			X

ENVIRONMENTAL SETTING

The project site's existing utilities and service systems are discussed below.

Wastewater

Wastewater collection and treatment services for the proposed project would be provided by the SASD and the SRCSD. Wastewater generated from the project area is collected in the SASD system through a series of sewer pipes and pump stations. Once collected in the SASD system, sewage flows into the SRCSD interceptor system, where the sewage is conveyed to the SRWWTP located near Elk Grove. The City's Department of Utilities is responsible for providing and maintain water, sewer collection, storm drainage, and flood control services for residents and businesses within City limits. The project would connect to the existing sanitary sewer main located in Osage Avenue.

Water Supply

To meet the City's water demand, the City primarily uses surface water from the Sacramento and American rivers, and groundwater pumped from the North American and South American Subbasins. According to the City's 2020 Urban Water Management Plan (UWMP), the City has a current total of 317,700 acre-feet per year (AFY) in water supplies during dry years and expects the total to increase to 350,200 AFY by 2035. The total City retail water demand in 2020 was 96,887 AFY and is expected to increase to 121,187 AFY in 2035. According to the Department of Utilities' 2019 Consumer Confidence Report, the City's drinking water meets or exceeds all federal and State drinking water standards.[24] The project would connect to the existing water main located in Osage Avenue.

Solid Waste Disposal

The City of Sacramento does not provide commercial solid waste collection services. Rather, commercial garbage, recycling, and yard waste services are provided by a franchised hauler authorized by the Sacramento Solid Waste Authority to collect commercial garbage and commingled recycling within the City. The Sacramento County Kiefer Landfill, located at 12701 Kiefer Boulevard in Sloughhouse, California, is the primary location for the disposal of waste for the City. According to the Master EIR, the Kiefer Landfill would serve the City adequately until the year 2065. As growth continues in the City, in accordance with the County General Plan and the City's General Plan, population would increase and the solid waste stream would continue to grow. However, implementation of the Solid Waste Authority and the Sacramento recycling requirements, would continue to significantly reduce potential cumulative impact on landfill capacity to a less-than-significant effect.

[24] City of Sacramento Department of Utilities. *2019 Consumer Confidence Report*. Available at: https://www.cityofsacramento.org/-/media/Water-Quality/CCR_web_r071020.pdf?la=en. Accessed August 2021.

STANDARDS OF SIGNIFICANCE

For the purposes of this Initial Study, an impact would be considered significant if the project resulted in the following:

- Result in the determination that adequate capacity is not available to serve the project's demand in addition to existing commitments; or
- Require or result in either the construction of new utilities or the expansion of existing utilities, the construction of which could cause significant environmental impacts.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the effects of development under the 2035 General Plan on water supply, sewer and storm drainage, solid waste, electricity, natural gas and telecommunications. See Chapter 4.11.

The Master EIR evaluated the impacts of increased demand for water that would occur with development under the 2035 General Plan. Policies in the general plan would reduce the impact generally to a less-than-significant level (see Impact 4.11-1) but the need for new water supply facilities results in a significant and unavoidable effect (Impact 4.11-2). The potential need for expansion of wastewater treatment facilities was identified as having a significant and unavoidable effect (Impacts 4.11-4, 4.11-5). Impacts on solid waste facilities were less than significant (Impacts 4.11-7, 4.11-8).

ANSWERS TO CHECKLIST QUESTIONS

Questions A and B

The project site is currently undeveloped except for a concrete pad and two transmission line towers and, therefore, not connected to existing utilities and service systems. The project site is located adjacent to existing development, including single-family residences and other industrial sites, that are connected to utility services. The proposed project would connect to the existing water and sewer lines in Osage Avenue.

Wastewater

As discussed above, the proposed project would be provided wastewater collection and treatment services by the SASD and the SRCSD. Wastewater generated by the proposed project would be collected in the SASD system. SASD requires each building on each lot to have a separate connection to SASD's sewer system. Multiple buildings located within a single parcel must have a separate connection the SASD public sewer line. Once collected, the wastewater would flow into the SRCSD interceptor system, where the wastewater would be conveyed to the SRWWTP for treatment.

The project's consistency with the allowable uses for the General Plan land use designation would ensure the demand for wastewater service would not exceed the amount anticipated for buildout of the Planning Area evaluated in the Master EIR. In addition, buildout capacity of the entire SASD service area was anticipated in the 2018 Sewer System Management Plan (SSMP).[25] As such, SASD has anticipated the need for wastewater services in the project area and requires development impact fees to support buildout demand of their service area (including the project site). Additionally, the SRCSD would require payment of sewer impact fees. All applicable impact fees would be required to be paid prior to issuance of a building permit.

Given the required payment of applicable impact fees, the SRCSD would be able to provide sufficient wastewater services and conveyance to serve full buildout of the City, including the project site, per the Master EIR. Therefore, adequate capacity exists to serve the project site's demands.

[25] Sacramento Area Sewer District. *Sewer System Management Plan.* June 8, 2018.

Water Supply

The City is responsible for providing and maintaining water service for the project site. The 2020 UWMP analyzed the water supply, water demand, and water shortage contingency planning for the City's service area, which would include the project site. According to the 2020 UWMP, under all drought conditions, the City possesses sufficient water supply entitlements to meet the demands of the City's customers up to the year 2035.[26]

The projections included in the 2020 UWMP are based on the planned buildout of the 2035 General Plan; therefore, because the proposed project is consistent with the General Plan land use designation for the project site, the UWMP accounted for the development of the project site with industrial uses. As a result, any increase in water use during construction and operation of the project was accounted for in regional growth estimates.

The proposed project is consistent with land use and zoning designations and would not generate an increase in demand from what has already been anticipated in the Master EIR. As such, adequate capacity would be available to serve the proposed project's water demands.

Solid Waste

As noted previously, solid waste generated by existing on-site uses and surrounding developments is currently transferred to Kiefer Landfill for disposal. The Master EIR concluded that adequate capacity at local landfills exists for full buildout of the General Plan. The proposed project is consistent with what is anticipated for the project site, and the associated increase in solid waste disposal needs associated with development of the site was considered in the Master EIR analysis. The proposed project would not generate an increase in solid waste from what has been anticipated in the Master EIR. As such, adequate capacity would be expected to be available to serve the proposed project's solid waste disposal needs.

Therefore, the proposed project's operational waste generation could be accommodated by the existing capacity of the Kiefer Landfill.

Conclusion

Because adequate capacity exists to serve the project's demands in addition to existing commitments, and construction of new utilities or expansion of existing facilities would not be required, implementation of the proposed project would result in ***no additional environmental effects*** beyond what was analyzed in the 2035 Master EIR.

MITIGATION MEASURES

None required.

FINDINGS

The project would have no additional project-specific environmental effects relating to Utilities and Service Systems.

26 City of Sacramento. *2020 Urban Water Management Plan*. Available at: https://www.cityofsacramento.org/-/media/Corporate/Files/DOU/Reports/R---038---City-of-Sacramento-Draft-2020-UWMP---05-18-21.pdf?la=en. Accessed August 2021.

Issues:	Effect will be studied in the EIR	Effect can be mitigated to less than significant	No additional significant environmental effect
15. MANDATORY FINDINGS OF SIGNIFICANCE A.) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X	
B.) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)		X	
C.) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X	

ANSWERS TO CHECKLIST QUESTIONS

Question A

Implementation of the proposed project would have the potential to adversely impact special-status animals and previously undiscovered cultural, tribal cultural resources, and/or human remains. However, with implementation of the mitigation measures required by this Initial Study, compliance with 2035 General Plan policies, and application of standard BMPs during construction, development of the proposed project would not result in any of the following: 1) degrade the quality of the environment; 2) substantially reduce or impact the habitat of fish or wildlife species; 3) cause fish or wildlife populations to drop below self-sustaining levels; 4) threaten to eliminate a plant or animal community; 5) reduce the number or restrict the range of a rare or endangered plant or animal; or 6) eliminate important examples of the major periods of California history or prehistory. Therefore, with implementation of the mitigation measures included in this Initial Study, the ***effect can be mitigated to less than significant.***

Question B

The proposed project is an allowed use under the project site's General Plan land use designation. Any indirect population growth associated with development of the project was included in the cumulative analysis of City buildout in the Master EIR. Applicable policies from the 2035 General Plan would be implemented as part of the proposed project, as well as the project-specific mitigation measures included in this Initial Study, to reduce the proposed project's contribution to potentially cumulative impacts. The potential impacts of the proposed project would be individually limited and would not be cumulatively considerable. As demonstrated in this Initial Study, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level with implementation of project-specific mitigation measures and compliance with applicable 2035 General Plan policies. When viewed in conjunction with other closely related past, present or reasonably foreseeable future projects, development of the proposed project would not contribute to cumulative impacts in the City. Therefore, with implementation of the mitigation measures included in this Initial Study, the ***effect can be mitigated to less than significant.***

Question C

As discussed in Section IV-2 and Section IV-7 of this Initial Study, implementation of the proposed project would not result in temporary or permanent impacts related to air quality or hazards, respectively, during construction or operation. As discussed in Section IV-9, impacts related to noise would be mitigated to less-than-significant levels. The proposed project would be required to implement the project-specific mitigation measures within this Initial Study, as well as applicable policies of the 2035 General Plan, to reduce any potential direct or indirect impacts that could occur to human beings or various resources and, as demonstrated in this Initial Study, with implementation of the identified mitigation measures, all impacts would be reduced to less-than-significant levels. Therefore, with implementation of the mitigation measures included in this Initial Study, the ***effect can be mitigated to less than significant.***

SECTION IV - ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would potentially be affected by this project.

____	Aesthetics	____	Hazards
____	Air Quality	X	Noise
X	Biological Resources	____	Public Services
X	Cultural Resources	____	Recreation
____	Energy and Mineral Resources	____	Transportation/Circulation
X	Geology and Soils	X	Tribal Cultural Resources
____	Hydrology and Water Quality	____	Utilities and Service Systems
____	None Identified		

SECTION V - DETERMINATION

On the basis of the Initial Study:

I find that (a) the proposed project is an anticipated subsequent project identified and described in the 2035 General Plan Master EIR; (b) the proposed project is consistent with the 2035 General Plan land use designation and the permissible densities and intensities of use for the project site; (c) that the discussions of cumulative impacts, growth inducing impacts, and irreversible significant effects in the Master EIR are adequate for the proposed project; and (d) the proposed project will have additional significant environmental effects not previously examined in the Master EIR. A Mitigated Negative Declaration will be prepared. Mitigation measures from the Master EIR will be applied to the project as appropriate, and additional feasible mitigation measures and alternatives will be incorporated to revise the proposed project before the negative declaration is circulated for public review, to avoid or mitigate the identified effects to a level of insignificance. (CEQA Guidelines Section 15178(b))

Scott Johnson

Signature

June 27, 2022

Date

Scott Johnson, Senior Planner

Printed Name

REFERENCES CITED

It should be noted that all of the technical reports used for the purposes of the analysis throughout this Initial Study are available upon request to staff at the City of Sacramento Community Development Department located at 300 Richards Boulevard, Third Floor, Sacramento, CA 95811. The following documents are referenced information sources used for the analysis within this Initial Study:

1. California Department of Conservation. *California Important Farmland Finder*. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed August 2021.
2. California Department of Forestry and Fire Protection. *Fire and Resource Assessment Program (FRAP).* Available at: https://frap.fire.ca.gov/. Accessed August 2021.
3. California Department of Transportation. *California Scenic Highway Mapping System, Sacramento County.* Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed August 2021.
4. California Department of Transportation. *Transportation and Construction Vibration Guidance Manual*. September 2013.
5. City of Sacramento Department of Utilities. *2019 Consumer Confidence Report*. Available at: https://www.cityofsacramento.org/-/media/Water-Quality/CCR_web_r071020.pdf?la=en. Accessed August 2021.
6. City of Sacramento. *Standard Specifications for Public Construction*. Available at: https://www.cityofsacramento.org/-/media/Corporate/Files/DOU/Specs-Drawings/Standard_Specifications.pdf?la=en. Accessed August 2021.
7. City of Sacramento. *2020 Urban Water Management Plan*. Available at: https://www.cityofsacramento.org/-/media/Corporate/Files/DOU/Reports/R---038---City-of-Sacramento-Draft-2020-UWMP---05-18-21.pdf?la=en. Accessed August 2021.
8. Department of Toxic Substances Control. *EnviroStor*. Available at: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=8981+osage+avenue+sacramento+ca. Accessed August 2021.
9. DKS Associates. *8981 Osage Avenue Warehouse VMT Analysis.* December 9, 2021.
10. DKS Associates. *8981 Osage Warehouse Focused Transportation Analysis.* December 9, 2021.
11. Federal Emergency Management Agency. *Flood Insurance Rate Map Community Panel Number 06067C0215H*. Available at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-121.37894748773853,38.51884549926846,-121.35817646112666,38.52723928717955. Accessed August 2021.
12. Metro Fire Sacramento. *About Us*. Available at: https://metrofire.ca.gov/about-us. Accessed August 2021.
13. Native American Heritage Commission. *Re: Osage Warehouse Project Sacramento County.* August 30, 2021.
14. North Central Information Center. *California Historical Resources Information System Record Search Results for Osage Warehouse Project (APN: 062-0030-012).* July 30, 2021.
15. Regional San. *Impact Fees.* Available at: https://www.regionalsan.com/impact-fees-businesses. Accessed March 2021.
16. Sacramento Area Sewer District. *Sewer Ordinance SDI-0072*. Effective May 27, 2016.
17. Sacramento Area Sewer District. *Sewer System Management Plan.* June 8, 2018.
18. Sacramento Metropolitan Air Quality Management District. *Guide to Air Quality Assessment, Chapter 4: Operational Criteria Air Pollutant and Precursor Emissions*. June 2020.
19. Saxelby Acoustics LLC. *Environmental Noise Assessment, Osage Warehouse.* May 9, 2022.
20. USDA Natural Resource Conservation Service. *Web Soil Survey.* Available at: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed August 2021.
21. U.S. Fish and Wildlife Service. *National Wetlands Inventory.* Available at: https://www.fws.gov/wetlands/data/Mapper.html. Accessed August 2021.

22. WeatherSpark. *Climate and Average Weather Year Round in Sacramento*. Available at: https://weatherspark.com/y/1157/Average-Weather-in-Sacramento-California-United-States-Year-Round. Accessed January 2022.

APPENDIX A
CALEEMOD MODELING RESULTS

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

Osage Warehouse

Sacramento Metropolitan AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	136.72	1000sqft	8.26	136,720.00	0
Parking Lot	139.00	Space	1.25	55,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2023
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	357.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Building acreage adjusted to represent the total lot acreage minus the parking lot acreage

Construction Phase - Building construction phase timing based on applicant provided information from the AQ/GHG questionnaire for the proposed project.

Demolition -

Grading -

Vehicle Trips - Based on trip rates included in Traffic Report prepared for the proposed project.

Mobile Land Use Mitigation -

Water Mitigation - Compliant with MWELO.

Operational Off-Road Equipment - Based on AQ questionnaire provided by the applicant.

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

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	100.00
tblConstructionPhase	NumDays	230.00	100.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.14	8.26
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	3.00
tblVehicleTrips	ST_TR	1.74	5.24
tblVehicleTrips	SU_TR	1.74	5.24
tblVehicleTrips	WD_TR	1.74	5.24

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.8207	1.6131	1.5615	3.1100e-003	0.2827	0.0762	0.3588	0.1255	0.0713	0.1968	0.0000	275.4952	275.4952	0.0564	5.9700e-003	278.6855
Maximum	**0.8207**	**1.6131**	**1.5615**	**3.1100e-003**	**0.2827**	**0.0762**	**0.3588**	**0.1255**	**0.0713**	**0.1968**	**0.0000**	**275.4952**	**275.4952**	**0.0564**	**5.9700e-003**	**278.6855**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.8207	1.6131	1.5615	3.1100e-003	0.2827	0.0762	0.3588	0.1255	0.0713	0.1968	0.0000	275.4950	275.4950	0.0564	5.9700e-003	278.6852
Maximum	**0.8207**	**1.6131**	**1.5615**	**3.1100e-003**	**0.2827**	**0.0762**	**0.3588**	**0.1255**	**0.0713**	**0.1968**	**0.0000**	**275.4950**	**275.4950**	**0.0564**	**5.9700e-003**	**278.6852**

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

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-2-2022	8-1-2022	0.7724	0.7724
2	8-2-2022	9-30-2022	0.7101	0.7101
		Highest	0.7724	0.7724

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6020	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003
Energy	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	77.5534	77.5534	6.8900e-003	8.9000e-004	77.9915
Mobile	0.3873	0.5366	3.7114	7.7300e-003	0.7724	6.1900e-003	0.7786	0.2065	5.7900e-003	0.2123	0.0000	722.3772	722.3772	0.0482	0.0355	734.1711
Offroad	0.0400	0.3743	0.4465	6.0000e-004		0.0231	0.0231		0.0213	0.0213	0.0000	52.3736	52.3736	0.0169	0.0000	52.7970
Waste						0.0000	0.0000		0.0000	0.0000	26.0884	0.0000	26.0884	1.5418	0.0000	64.6329
Water						0.0000	0.0000		0.0000	0.0000	11.1860	25.5796	36.7656	0.0409	0.0246	45.1214
Total	**1.0297**	**0.9142**	**4.1641**	**8.3500e-003**	**0.7724**	**0.0296**	**0.8020**	**0.2065**	**0.0273**	**0.2339**	**37.2744**	**877.8907**	**915.1651**	**1.6547**	**0.0610**	**974.7212**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6020	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003
Energy	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	77.5534	77.5534	6.8900e-003	8.9000e-004	77.9915
Mobile	0.3838	0.5280	3.6525	7.5800e-003	0.7570	6.0800e-003	0.7631	0.2024	5.6800e-003	0.2081	0.0000	708.3096	708.3096	0.0476	0.0350	719.9215
Offroad	0.0400	0.3743	0.4465	6.0000e-004		0.0231	0.0231		0.0213	0.0213	0.0000	52.3736	52.3736	0.0169	0.0000	52.7970
Waste						0.0000	0.0000		0.0000	0.0000	26.0884	0.0000	26.0884	1.5418	0.0000	64.6329
Water						0.0000	0.0000		0.0000	0.0000	11.1860	25.5796	36.7656	0.0409	0.0246	45.1214
Total	**1.0262**	**0.9056**	**4.1053**	**8.2000e-003**	**0.7570**	**0.0295**	**0.7865**	**0.2024**	**0.0272**	**0.2296**	**37.2744**	**863.8230**	**901.0974**	**1.6541**	**0.0605**	**960.4716**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.34**	**0.94**	**1.41**	**1.80**	**2.00**	**0.37**	**1.94**	**2.00**	**0.40**	**1.81**	**0.00**	**1.60**	**1.54**	**0.04**	**0.92**	**1.46**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/2/2022	5/6/2022	5	5	
2	Site Preparation	Site Preparation	5/7/2022	5/20/2022	5	10	

3	Grading	Grading	5/21/2022	7/8/2022	5	35	
4	Paving	Paving	7/9/2022	7/22/2022	5	10	
5	Building Construction	Building Construction	7/23/2022	12/9/2022	5	100	
6	Architectural Coating	Architectural Coating	8/6/2022	12/23/2022	5	100	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 35

Acres of Paving: 1.25

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,080; Non-Residential Outdoor: 68,360; Striped Parking Area: 3,336 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36

Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	81.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0112	0.0000	0.0112	1.7000e-003	0.0000	1.7000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6000e-003	0.0643	0.0515	1.0000e-004		3.1100e-003	3.1100e-003		2.8900e-003	2.8900e-003	0.0000	8.4976	8.4976	2.3900e-003	0.0000	8.5572
Total	**6.6000e-003**	**0.0643**	**0.0515**	**1.0000e-004**	**0.0112**	**3.1100e-003**	**0.0143**	**1.7000e-003**	**2.8900e-003**	**4.5900e-003**	**0.0000**	**8.4976**	**8.4976**	**2.3900e-003**	**0.0000**	**8.5572**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-004	9.1100e-003	1.7000e-003	3.0000e-005	8.4000e-004	7.0000e-005	9.1000e-004	2.3000e-004	7.0000e-005	3.0000e-004	0.0000	3.1810	3.1810	1.3000e-004	5.0000e-004	3.3345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	9.5000e-004	0.0000	2.8000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2268	0.2268	1.0000e-005	1.0000e-005	0.2290
Total	**3.2000e-004**	**9.1900e-003**	**2.6500e-003**	**3.0000e-005**	**1.1200e-003**	**7.0000e-005**	**1.1900e-003**	**3.0000e-004**	**7.0000e-005**	**3.7000e-004**	**0.0000**	**3.4078**	**3.4078**	**1.4000e-004**	**5.1000e-004**	**3.5635**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0112	0.0000	0.0112	1.7000e-003	0.0000	1.7000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6000e-003	0.0643	0.0515	1.0000e-004		3.1100e-003	3.1100e-003		2.8900e-003	2.8900e-003	0.0000	8.4976	8.4976	2.3900e-003	0.0000	8.5572
Total	**6.6000e-003**	**0.0643**	**0.0515**	**1.0000e-004**	**0.0112**	**3.1100e-003**	**0.0143**	**1.7000e-003**	**2.8900e-003**	**4.5900e-003**	**0.0000**	**8.4976**	**8.4976**	**2.3900e-003**	**0.0000**	**8.5572**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-004	9.1100e-003	1.7000e-003	3.0000e-005	8.4000e-004	7.0000e-005	9.1000e-004	2.3000e-004	7.0000e-005	3.0000e-004	0.0000	3.1810	3.1810	1.3000e-004	5.0000e-004	3.3345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	9.5000e-004	0.0000	2.8000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2268	0.2268	1.0000e-005	1.0000e-005	0.2290
Total	**3.2000e-004**	**9.1900e-003**	**2.6500e-003**	**3.0000e-005**	**1.1200e-003**	**7.0000e-005**	**1.1900e-003**	**3.0000e-004**	**7.0000e-005**	**3.7000e-004**	**0.0000**	**3.4078**	**3.4078**	**1.4000e-004**	**5.1000e-004**	**3.5635**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.8000e-004	2.2700e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5443	0.5443	2.0000e-005	2.0000e-005	0.5496
Total	**2.8000e-004**	**1.8000e-004**	**2.2700e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5443**	**0.5443**	**2.0000e-005**	**2.0000e-005**	**0.5496**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.8000e-004	2.2700e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5443	0.5443	2.0000e-005	2.0000e-005	0.5496
Total	**2.8000e-004**	**1.8000e-004**	**2.2700e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5443**	**0.5443**	**2.0000e-005**	**2.0000e-005**	**0.5496**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1240	0.0000	0.1240	0.0599	0.0000	0.0599	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0341	0.3650	0.2673	5.2000e-004		0.0165	0.0165		0.0152	0.0152	0.0000	45.5958	45.5958	0.0148	0.0000	45.9645
Total	**0.0341**	**0.3650**	**0.2673**	**5.2000e-004**	**0.1240**	**0.0165**	**0.1404**	**0.0599**	**0.0152**	**0.0751**	**0.0000**	**45.5958**	**45.5958**	**0.0148**	**0.0000**	**45.9645**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	5.3000e-004	6.6200e-003	2.0000e-005	1.9300e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.5875	1.5875	5.0000e-005	5.0000e-005	1.6031
Total	**8.1000e-004**	**5.3000e-004**	**6.6200e-003**	**2.0000e-005**	**1.9300e-003**	**1.0000e-005**	**1.9400e-003**	**5.1000e-004**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**1.5875**	**1.5875**	**5.0000e-005**	**5.0000e-005**	**1.6031**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1240	0.0000	0.1240	0.0599	0.0000	0.0599	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0341	0.3650	0.2673	5.2000e-004		0.0165	0.0165		0.0152	0.0152	0.0000	45.5958	45.5958	0.0148	0.0000	45.9645
Total	**0.0341**	**0.3650**	**0.2673**	**5.2000e-004**	**0.1240**	**0.0165**	**0.1404**	**0.0599**	**0.0152**	**0.0751**	**0.0000**	**45.5958**	**45.5958**	**0.0148**	**0.0000**	**45.9645**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	5.3000e-004	6.6200e-003	2.0000e-005	1.9300e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.5875	1.5875	5.0000e-005	5.0000e-005	1.6031
Total	**8.1000e-004**	**5.3000e-004**	**6.6200e-003**	**2.0000e-005**	**1.9300e-003**	**1.0000e-005**	**1.9400e-003**	**5.1000e-004**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**1.5875**	**1.5875**	**5.0000e-005**	**5.0000e-005**	**1.6031**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5100e-003	0.0556	0.0729	1.1000e-004		2.8400e-003	2.8400e-003		2.6100e-003	2.6100e-003	0.0000	10.0138	10.0138	3.2400e-003	0.0000	10.0948
Paving	1.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.1500e-003**	**0.0556**	**0.0729**	**1.1000e-004**		**2.8400e-003**	**2.8400e-003**		**2.6100e-003**	**2.6100e-003**	**0.0000**	**10.0138**	**10.0138**	**3.2400e-003**	**0.0000**	**10.0948**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.8900e-003	0.0000	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4536	0.4536	2.0000e-005	1.0000e-005	0.4580
Total	**2.3000e-004**	**1.5000e-004**	**1.8900e-003**	**0.0000**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4536**	**0.4536**	**2.0000e-005**	**1.0000e-005**	**0.4580**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5100e-003	0.0556	0.0729	1.1000e-004		2.8400e-003	2.8400e-003		2.6100e-003	2.6100e-003	0.0000	10.0138	10.0138	3.2400e-003	0.0000	10.0947
Paving	1.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.1500e-003**	**0.0556**	**0.0729**	**1.1000e-004**		**2.8400e-003**	**2.8400e-003**		**2.6100e-003**	**2.6100e-003**	**0.0000**	**10.0138**	**10.0138**	**3.2400e-003**	**0.0000**	**10.0947**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.8900e-003	0.0000	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4536	0.4536	2.0000e-005	1.0000e-005	0.4580
Total	**2.3000e-004**	**1.5000e-004**	**1.8900e-003**	**0.0000**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4536**	**0.4536**	**2.0000e-005**	**1.0000e-005**	**0.4580**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0853	0.7808	0.8182	1.3500e-003		0.0405	0.0405		0.0381	0.0381	0.0000	115.8626	115.8626	0.0278	0.0000	116.5566
Total	**0.0853**	**0.7808**	**0.8182**	**1.3500e-003**		**0.0405**	**0.0405**		**0.0381**	**0.0381**	**0.0000**	**115.8626**	**115.8626**	**0.0278**	**0.0000**	**116.5566**

3.6 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4100e-003	0.0918	0.0267	3.2000e-004	9.3700e-003	8.5000e-004	0.0102	2.7100e-003	8.1000e-004	3.5200e-003	0.0000	30.7148	30.7148	8.0000e-004	4.5000e-003	32.0767
Worker	0.0125	8.1200e-003	0.1022	2.7000e-004	0.0297	1.7000e-004	0.0299	7.9100e-003	1.5000e-004	8.0700e-003	0.0000	24.4933	24.4933	8.4000e-004	7.4000e-004	24.7339
Total	**0.0159**	**0.1000**	**0.1289**	**5.9000e-004**	**0.0391**	**1.0200e-003**	**0.0401**	**0.0106**	**9.6000e-004**	**0.0116**	**0.0000**	**55.2081**	**55.2081**	**1.6400e-003**	**5.2400e-003**	**56.8105**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0853	0.7808	0.8182	1.3500e-003		0.0405	0.0405		0.0381	0.0381	0.0000	115.8625	115.8625	0.0278	0.0000	116.5564
Total	**0.0853**	**0.7808**	**0.8182**	**1.3500e-003**		**0.0405**	**0.0405**		**0.0381**	**0.0381**	**0.0000**	**115.8625**	**115.8625**	**0.0278**	**0.0000**	**116.5564**

3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4100e-003	0.0918	0.0267	3.2000e-004	9.3700e-003	8.5000e-004	0.0102	2.7100e-003	8.1000e-004	3.5200e-003	0.0000	30.7148	30.7148	8.0000e-004	4.5000e-003	32.0767
Worker	0.0125	8.1200e-003	0.1022	2.7000e-004	0.0297	1.7000e-004	0.0299	7.9100e-003	1.5000e-004	8.0700e-003	0.0000	24.4933	24.4933	8.4000e-004	7.4000e-004	24.7339
Total	**0.0159**	**0.1000**	**0.1289**	**5.9000e-004**	**0.0391**	**1.0200e-003**	**0.0401**	**0.0106**	**9.6000e-004**	**0.0116**	**0.0000**	**55.2081**	**55.2081**	**1.6400e-003**	**5.2400e-003**	**56.8105**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6414					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.0704	0.0907	1.5000e-004		4.0900e-003	4.0900e-003		4.0900e-003	4.0900e-003	0.0000	12.7663	12.7663	8.3000e-004	0.0000	12.7871
Total	**0.6517**	**0.0704**	**0.0907**	**1.5000e-004**		**4.0900e-003**	**4.0900e-003**		**4.0900e-003**	**4.0900e-003**	**0.0000**	**12.7663**	**12.7663**	**8.3000e-004**	**0.0000**	**12.7871**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4600e-003	1.6000e-003	0.0202	5.0000e-005	5.8800e-003	3.0000e-005	5.9100e-003	1.5600e-003	3.0000e-005	1.5900e-003	0.0000	4.8382	4.8382	1.7000e-004	1.5000e-004	4.8857
Total	**2.4600e-003**	**1.6000e-003**	**0.0202**	**5.0000e-005**	**5.8800e-003**	**3.0000e-005**	**5.9100e-003**	**1.5600e-003**	**3.0000e-005**	**1.5900e-003**	**0.0000**	**4.8382**	**4.8382**	**1.7000e-004**	**1.5000e-004**	**4.8857**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6414					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.0704	0.0907	1.5000e-004		4.0900e-003	4.0900e-003		4.0900e-003	4.0900e-003	0.0000	12.7663	12.7663	8.3000e-004	0.0000	12.7870
Total	**0.6517**	**0.0704**	**0.0907**	**1.5000e-004**		**4.0900e-003**	**4.0900e-003**		**4.0900e-003**	**4.0900e-003**	**0.0000**	**12.7663**	**12.7663**	**8.3000e-004**	**0.0000**	**12.7870**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4600e-003	1.6000e-003	0.0202	5.0000e-005	5.8800e-003	3.0000e-005	5.9100e-003	1.5600e-003	3.0000e-005	1.5900e-003	0.0000	4.8382	4.8382	1.7000e-004	1.5000e-004	4.8857
Total	**2.4600e-003**	**1.6000e-003**	**0.0202**	**5.0000e-005**	**5.8800e-003**	**3.0000e-005**	**5.9100e-003**	**1.5600e-003**	**3.0000e-005**	**1.5900e-003**	**0.0000**	**4.8382**	**4.8382**	**1.7000e-004**	**1.5000e-004**	**4.8857**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3838	0.5280	3.6525	7.5800e-003	0.7570	6.0800e-003	0.7631	0.2024	5.6800e-003	0.2081	0.0000	708.3096	708.3096	0.0476	0.0350	719.9215
Unmitigated	0.3873	0.5366	3.7114	7.7300e-003	0.7724	6.1900e-003	0.7786	0.2065	5.7900e-003	0.2123	0.0000	722.3772	722.3772	0.0482	0.0355	734.1711

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	716.41	716.41	716.41	2,083,550	2,041,879
Total	716.41	716.41	716.41	2,083,550	2,041,879

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507
Unrefrigerated Warehouse-No Rail	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	73.9784	73.9784	6.8200e-003	8.3000e-004	74.3953
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	73.9784	73.9784	6.8200e-003	8.3000e-004	74.3953
NaturalGas Mitigated	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.5750	3.5750	7.0000e-005	7.0000e-005	3.5962
NaturalGas Unmitigated	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.5750	3.5750	7.0000e-005	7.0000e-005	3.5962

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	66992.8	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.5750	3.5750	7.0000e-005	7.0000e-005	3.5962
Total		**3.6000e-004**	**3.2800e-003**	**2.7600e-003**	**2.0000e-005**		**2.5000e-004**	**2.5000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**3.5750**	**3.5750**	**7.0000e-005**	**7.0000e-005**	**3.5962**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	66992.8	3.6000e-004	3.2800e-003	2.7600e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.5750	3.5750	7.0000e-005	7.0000e-005	3.5962
Total		**3.6000e-004**	**3.2800e-003**	**2.7600e-003**	**2.0000e-005**		**2.5000e-004**	**2.5000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**3.5750**	**3.5750**	**7.0000e-005**	**7.0000e-005**	**3.5962**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	19460	3.1599	2.9000e-004	4.0000e-005	3.1777
Unrefrigerated Warehouse-No Rail	436137	70.8186	6.5300e-003	7.9000e-004	71.2176
Total		**73.9784**	**6.8200e-003**	**8.3000e-004**	**74.3953**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	19460	3.1599	2.9000e-004	4.0000e-005	3.1777
Unrefrigerated Warehouse-No Rail	436137	70.8186	6.5300e-003	7.9000e-004	71.2176
Total		**73.9784**	**6.8200e-003**	**8.3000e-004**	**74.3953**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6020	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003
Unmitigated	0.6020	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0641					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5376					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003
Total	**0.6020**	**3.0000e-005**	**3.5200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**6.8400e-003**	**6.8400e-003**	**2.0000e-005**	**0.0000**	**7.2900e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0641					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5376					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.8400e-003	6.8400e-003	2.0000e-005	0.0000	7.2900e-003
Total	**0.6020**	**3.0000e-005**	**3.5200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**6.8400e-003**	**6.8400e-003**	**2.0000e-005**	**0.0000**	**7.2900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	36.7656	0.0409	0.0246	45.1214
Unmitigated	36.7656	0.0409	0.0246	45.1214

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	31.6165 / 0	36.7656	0.0409	0.0246	45.1214
Total		**36.7656**	**0.0409**	**0.0246**	**45.1214**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	31.6165 / 0	36.7656	0.0409	0.0246	45.1214
Total		**36.7656**	**0.0409**	**0.0246**	**45.1214**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	26.0884	1.5418	0.0000	64.6329
Unmitigated	26.0884	1.5418	0.0000	64.6329

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	128.52	26.0884	1.5418	0.0000	64.6329
Total		**26.0884**	**1.5418**	**0.0000**	**64.6329**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	128.52	26.0884	1.5418	0.0000	64.6329
Total		**26.0884**	**1.5418**	**0.0000**	**64.6329**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	3	8.00	260	89	0.20	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Forklifts	0.0400	0.3743	0.4465	6.0000e-004		0.0231	0.0231		0.0213	0.0213	0.0000	52.3736	52.3736	0.0169	0.0000	52.7970
Total	**0.0400**	**0.3743**	**0.4465**	**6.0000e-004**		**0.0231**	**0.0231**		**0.0213**	**0.0213**	**0.0000**	**52.3736**	**52.3736**	**0.0169**	**0.0000**	**52.7970**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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

Osage Warehouse

Sacramento Metropolitan AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	136.72	1000sqft	8.26	136,720.00	0
Parking Lot	139.00	Space	1.25	55,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2023
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	357.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Building acreage adjusted to represent the total lot acreage minus the parking lot acreage

Construction Phase - Building construction phase timing based on applicant provided information from the AQ/GHG questionnaire for the proposed project.

Demolition -

Grading -

Vehicle Trips - Based on trip rates included in Traffic Report prepared for the proposed project.

Mobile Land Use Mitigation -

Water Mitigation - Compliant with MWELO.

Operational Off-Road Equipment - Based on AQ questionnaire provided by the applicant.

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

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	100.00
tblConstructionPhase	NumDays	230.00	100.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.14	8.26
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	3.00
tblVehicleTrips	ST_TR	1.74	5.24
tblVehicleTrips	SU_TR	1.74	5.24
tblVehicleTrips	WD_TR	1.74	5.24

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	15.1601	33.1165	21.7136	0.0528	19.7939	1.6133	21.4073	10.1388	1.4843	11.6230	0.0000	5,258.906 6	5,258.906 6	1.1961	0.2251	5,353.800 4
Maximum	**15.1601**	**33.1165**	**21.7136**	**0.0528**	**19.7939**	**1.6133**	**21.4073**	**10.1388**	**1.4843**	**11.6230**	**0.0000**	**5,258.906 6**	**5,258.906 6**	**1.1961**	**0.2251**	**5,353.800 4**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	15.1601	33.1165	21.7136	0.0528	19.7939	1.6133	21.4073	10.1388	1.4843	11.6230	0.0000	5,258.906 6	5,258.906 6	1.1961	0.2251	5,353.800 4
Maximum	**15.1601**	**33.1165**	**21.7136**	**0.0528**	**19.7939**	**1.6133**	**21.4073**	**10.1388**	**1.4843**	**11.6230**	**0.0000**	**5,258.906 6**	**5,258.906 6**	**1.1961**	**0.2251**	**5,353.800 4**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Energy	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Mobile	2.5842	2.7120	22.2298	0.0457	4.3945	0.0340	4.4285	1.1718	0.0318	1.2036		4,702.2909	4,702.2909	0.2800	0.2064	4,770.7875
Offroad	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**6.1934**	**5.6093**	**25.7074**	**0.0504**	**4.3945**	**0.2134**	**4.6079**	**1.1718**	**0.1970**	**1.3687**	**0.0000**	**5,168.0369**	**5,168.0369**	**0.4242**	**0.2068**	**5,240.2565**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Energy	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Mobile	2.5647	2.6689	21.8557	0.0448	4.3066	0.0334	4.3400	1.1483	0.0312	1.1796		4,610.5193	4,610.5193	0.2761	0.2031	4,677.9534
Offroad	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**6.1739**	**5.5662**	**25.3334**	**0.0495**	**4.3066**	**0.2128**	**4.5194**	**1.1483**	**0.1964**	**1.3447**	**0.0000**	**5,076.2653**	**5,076.2653**	**0.4203**	**0.2035**	**5,147.4224**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.31**	**0.77**	**1.46**	**1.77**	**2.00**	**0.29**	**1.92**	**2.00**	**0.29**	**1.75**	**0.00**	**1.78**	**1.78**	**0.92**	**1.57**	**1.77**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/2/2022	5/6/2022	5	5	
2	Site Preparation	Site Preparation	5/7/2022	5/20/2022	5	10	
3	Grading	Grading	5/21/2022	7/8/2022	5	35	
4	Paving	Paving	7/9/2022	7/22/2022	5	10	

5	Building Construction	Building Construction	7/23/2022	12/9/2022	5	100	
6	Architectural Coating	Architectural Coating	8/6/2022	12/23/2022	5	100	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 35

Acres of Paving: 1.25

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,080; Non-Residential Outdoor: 68,360; Striped Parking Area: 3,336 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	81.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4839	0.0000	4.4839	0.6789	0.0000	0.6789			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.781 2	3,746.781 2	1.0524		3,773.092 0
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**4.4839**	**1.2427**	**5.7266**	**0.6789**	**1.1553**	**1.8342**		**3,746.781 2**	**3,746.781 2**	**1.0524**		**3,773.092 0**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0823	3.4421	0.6758	0.0129	0.3454	0.0297	0.3750	0.0946	0.0284	0.1230		1,402.5126	1,402.5126	0.0563	0.2223	1,470.1702
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.1366**	**3.4696**	**1.1195**	**0.0139**	**0.4595**	**0.0303**	**0.4897**	**0.1249**	**0.0290**	**0.1538**		**1,512.1254**	**1,512.1254**	**0.0596**	**0.2251**	**1,580.7084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4839	0.0000	4.4839	0.6789	0.0000	0.6789			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**4.4839**	**1.2427**	**5.7266**	**0.6789**	**1.1553**	**1.8342**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

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

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0823	3.4421	0.6758	0.0129	0.3454	0.0297	0.3750	0.0946	0.0284	0.1230		1,402.512 6	1,402.512 6	0.0563	0.2223	1,470.170 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.1366**	**3.4696**	**1.1195**	**0.0139**	**0.4595**	**0.0303**	**0.4897**	**0.1249**	**0.0290**	**0.1538**		**1,512.125 4**	**1,512.125 4**	**0.0596**	**0.2251**	**1,580.708 4**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.061 9	3,686.061 9	1.1922		3,715.865 5
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.061 9**	**3,686.061 9**	**1.1922**		**3,715.865 5**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0652	0.0329	0.5324	1.2900e-003	0.1369	7.4000e-004	0.1377	0.0363	6.8000e-004	0.0370		131.5353	131.5353	3.9000e-003	3.4000e-003	132.6458
Total	**0.0652**	**0.0329**	**0.5324**	**1.2900e-003**	**0.1369**	**7.4000e-004**	**0.1377**	**0.0363**	**6.8000e-004**	**0.0370**		**131.5353**	**131.5353**	**3.9000e-003**	**3.4000e-003**	**132.6458**

Mitigated Construction On-Site

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

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0652	0.0329	0.5324	1.2900e-003	0.1369	7.4000e-004	0.1377	0.0363	6.8000e-004	0.0370		131.5353	131.5353	3.9000e-003	3.4000e-003	132.6458
Total	**0.0652**	**0.0329**	**0.5324**	**1.2900e-003**	**0.1369**	**7.4000e-004**	**0.1377**	**0.0363**	**6.8000e-004**	**0.0370**		**131.5353**	**131.5353**	**3.9000e-003**	**3.4000e-003**	**132.6458**

3.4 Grading - 2022

Unmitigated Construction On-Site

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

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.0544**	**0.0275**	**0.4436**	**1.0800e-003**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**109.6128**	**109.6128**	**3.2500e-003**	**2.8300e-003**	**110.5382**

Mitigated Construction On-Site

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

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.0544**	**0.0275**	**0.4436**	**1.0800e-003**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**109.6128**	**109.6128**	**3.2500e-003**	**2.8300e-003**	**110.5382**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.3275					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4303**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.0544**	**0.0275**	**0.4436**	**1.0800e-003**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**109.6128**	**109.6128**	**3.2500e-003**	**2.8300e-003**	**110.5382**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.3275					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4303**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0544	0.0275	0.4436	1.0800e-003	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		109.6128	109.6128	3.2500e-003	2.8300e-003	110.5382
Total	**0.0544**	**0.0275**	**0.4436**	**1.0800e-003**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**109.6128**	**109.6128**	**3.2500e-003**	**2.8300e-003**	**110.5382**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

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

3.6 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0692	1.7431	0.5248	6.3200e-003	0.1928	0.0169	0.2098	0.0555	0.0162	0.0717		677.1813	677.1813	0.0177	0.0992	707.1760
Worker	0.2935	0.1482	2.3957	5.8200e-003	0.6162	3.3400e-003	0.6195	0.1634	3.0800e-003	0.1665		591.9089	591.9089	0.0176	0.0153	596.9063
Total	**0.3627**	**1.8913**	**2.9205**	**0.0121**	**0.8090**	**0.0203**	**0.8293**	**0.2189**	**0.0193**	**0.2382**		**1,269.0901**	**1,269.0901**	**0.0353**	**0.1145**	**1,304.0823**

Mitigated Construction On-Site

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

3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0692	1.7431	0.5248	6.3200e-003	0.1928	0.0169	0.2098	0.0555	0.0162	0.0717		677.1813	677.1813	0.0177	0.0992	707.1760
Worker	0.2935	0.1482	2.3957	5.8200e-003	0.6162	3.3400e-003	0.6195	0.1634	3.0800e-003	0.1665		591.9089	591.9089	0.0176	0.0153	596.9063
Total	**0.3627**	**1.8913**	**2.9205**	**0.0121**	**0.8090**	**0.0203**	**0.8293**	**0.2189**	**0.0193**	**0.2382**		**1,269.0901**	**1,269.0901**	**0.0353**	**0.1145**	**1,304.0823**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8286					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**13.0331**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0293	0.4732	1.1500e-003	0.1217	6.6000e-004	0.1224	0.0323	6.1000e-004	0.0329		116.9203	116.9203	3.4700e-003	3.0200e-003	117.9074
Total	**0.0580**	**0.0293**	**0.4732**	**1.1500e-003**	**0.1217**	**6.6000e-004**	**0.1224**	**0.0323**	**6.1000e-004**	**0.0329**		**116.9203**	**116.9203**	**3.4700e-003**	**3.0200e-003**	**117.9074**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8286					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**13.0331**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0580	0.0293	0.4732	1.1500e-003	0.1217	6.6000e-004	0.1224	0.0323	6.1000e-004	0.0329		116.9203	116.9203	3.4700e-003	3.0200e-003	117.9074
Total	**0.0580**	**0.0293**	**0.4732**	**1.1500e-003**	**0.1217**	**6.6000e-004**	**0.1224**	**0.0323**	**6.1000e-004**	**0.0329**		**116.9203**	**116.9203**	**3.4700e-003**	**3.0200e-003**	**117.9074**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.5647	2.6689	21.8557	0.0448	4.3066	0.0334	4.3400	1.1483	0.0312	1.1796		4,610.5193	4,610.5193	0.2761	0.2031	4,677.9534
Unmitigated	2.5842	2.7120	22.2298	0.0457	4.3945	0.0340	4.4285	1.1718	0.0318	1.2036		4,702.2909	4,702.2909	0.2800	0.2064	4,770.7875

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	716.41	716.41	716.41	2,083,550	2,041,879
Total	716.41	716.41	716.41	2,083,550	2,041,879

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507
Unrefrigerated Warehouse-No Rail	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
NaturalGas Unmitigated	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	183.542	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Total		**1.9800e-003**	**0.0180**	**0.0151**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**		**21.5932**	**21.5932**	**4.1000e-004**	**4.0000e-004**	**21.7215**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.183542	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Total		**1.9800e-003**	**0.0180**	**0.0151**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**		**21.5932**	**21.5932**	**4.1000e-004**	**4.0000e-004**	**21.7215**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Unmitigated	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3515					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.6100e-003	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Total	**3.2996**	**2.6000e-004**	**0.0282**	**0.0000**		**1.0000e-004**	**1.0000e-004**		**1.0000e-004**	**1.0000e-004**		**0.0603**	**0.0603**	**1.6000e-004**		**0.0643**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3515					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.6100e-003	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Total	**3.2996**	**2.6000e-004**	**0.0282**	**0.0000**		**1.0000e-004**	**1.0000e-004**		**1.0000e-004**	**1.0000e-004**		**0.0603**	**0.0603**	**1.6000e-004**		**0.0643**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	3	8.00	260	89	0.20	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Forklifts	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**0.3076**	**2.8790**	**3.4344**	**4.5900e-003**		**0.1779**	**0.1779**		**0.1637**	**0.1637**	**0.0000**	**444.0925**	**444.0925**	**0.1436**		**447.6832**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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

Osage Warehouse

Sacramento Metropolitan AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	136.72	1000sqft	8.26	136,720.00	0
Parking Lot	139.00	Space	1.25	55,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2023
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	357.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Building acreage adjusted to represent the total lot acreage minus the parking lot acreage

Construction Phase - Building construction phase timing based on applicant provided information from the AQ/GHG questionnaire for the proposed project.

Demolition -

Grading -

Vehicle Trips - Based on trip rates included in Traffic Report prepared for the proposed project.

Mobile Land Use Mitigation -

Water Mitigation - Compliant with MWELO.

Operational Off-Road Equipment - Based on AQ questionnaire provided by the applicant.

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

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	100.00
tblConstructionPhase	NumDays	230.00	100.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.14	8.26
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	3.00
tblVehicleTrips	ST_TR	1.74	5.24
tblVehicleTrips	SU_TR	1.74	5.24
tblVehicleTrips	WD_TR	1.74	5.24

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	15.1180	33.1240	21.6681	0.0527	19.7939	1.6133	21.4073	10.1388	1.4843	11.6230	0.0000	5,246.962 9	5,246.962 9	1.1966	0.2256	5,342.003 4
Maximum	**15.1180**	**33.1240**	**21.6681**	**0.0527**	**19.7939**	**1.6133**	**21.4073**	**10.1388**	**1.4843**	**11.6230**	**0.0000**	**5,246.962 9**	**5,246.962 9**	**1.1966**	**0.2256**	**5,342.003 4**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	15.1180	33.1240	21.6681	0.0527	19.7939	1.6133	21.4073	10.1388	1.4843	11.6230	0.0000	5,246.962 9	5,246.962 9	1.1966	0.2256	5,342.003 4
Maximum	**15.1180**	**33.1240**	**21.6681**	**0.0527**	**19.7939**	**1.6133**	**21.4073**	**10.1388**	**1.4843**	**11.6230**	**0.0000**	**5,246.962 9**	**5,246.962 9**	**1.1966**	**0.2256**	**5,342.003 4**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Energy	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Mobile	2.0687	3.1436	21.6211	0.0417	4.3945	0.0341	4.4286	1.1718	0.0319	1.2036		4,297.4431	4,297.4431	0.3136	0.2257	4,372.5384
Offroad	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**5.6778**	**6.0409**	**25.0987**	**0.0464**	**4.3945**	**0.2135**	**4.6080**	**1.1718**	**0.1970**	**1.3688**	**0.0000**	**4,763.1891**	**4,763.1891**	**0.4578**	**0.2261**	**4,842.0073**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Energy	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Mobile	2.0484	3.0934	21.2934	0.0409	4.3066	0.0335	4.3401	1.1483	0.0313	1.1796		4,213.8384	4,213.8384	0.3097	0.2222	4,287.7900
Offroad	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**5.6576**	**5.9907**	**24.7710**	**0.0456**	**4.3066**	**0.2128**	**4.5195**	**1.1483**	**0.1964**	**1.3447**	**0.0000**	**4,679.5844**	**4,679.5844**	**0.4539**	**0.2226**	**4,757.2590**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.36**	**0.83**	**1.31**	**1.74**	**2.00**	**0.29**	**1.92**	**2.00**	**0.29**	**1.75**	**0.00**	**1.76**	**1.76**	**0.85**	**1.55**	**1.75**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/2/2022	5/6/2022	5	5	
2	Site Preparation	Site Preparation	5/7/2022	5/20/2022	5	10	
3	Grading	Grading	5/21/2022	7/8/2022	5	35	
4	Paving	Paving	7/9/2022	7/22/2022	5	10	

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

5	Building Construction	Building Construction	7/23/2022	12/9/2022	5	100	
6	Architectural Coating	Architectural Coating	8/6/2022	12/23/2022	5	100	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 35

Acres of Paving: 1.25

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,080; Non-Residential Outdoor: 68,360; Striped Parking Area: 3,336 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	81.00	32.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4839	0.0000	4.4839	0.6789	0.0000	0.6789			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.781 2	3,746.781 2	1.0524		3,773.092 0
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**4.4839**	**1.2427**	**5.7266**	**0.6789**	**1.1553**	**1.8342**		**3,746.781 2**	**3,746.781 2**	**1.0524**		**3,773.092 0**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0800	3.7183	0.6898	0.0129	0.3454	0.0298	0.3751	0.0946	0.0285	0.1231		1,402.7147	1,402.7147	0.0562	0.2224	1,470.3825
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.1281**	**3.7520**	**1.0741**	**0.0138**	**0.4595**	**0.0304**	**0.4898**	**0.1249**	**0.0290**	**0.1539**		**1,500.1817**	**1,500.1817**	**0.0599**	**0.2256**	**1,568.9114**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4839	0.0000	4.4839	0.6789	0.0000	0.6789			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**4.4839**	**1.2427**	**5.7266**	**0.6789**	**1.1553**	**1.8342**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0800	3.7183	0.6898	0.0129	0.3454	0.0298	0.3751	0.0946	0.0285	0.1231		1,402.714 7	1,402.714 7	0.0562	0.2224	1,470.382 5
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.1281**	**3.7520**	**1.0741**	**0.0138**	**0.4595**	**0.0304**	**0.4898**	**0.1249**	**0.0290**	**0.1539**		**1,500.181 7**	**1,500.181 7**	**0.0599**	**0.2256**	**1,568.911 4**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.061 9	3,686.061 9	1.1922		3,715.865 5
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.061 9**	**3,686.061 9**	**1.1922**		**3,715.865 5**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0576	0.0404	0.4612	1.1500e-003	0.1369	7.4000e-004	0.1377	0.0363	6.8000e-004	0.0370		116.9605	116.9605	4.4700e-003	3.9000e-003	118.2347
Total	**0.0576**	**0.0404**	**0.4612**	**1.1500e-003**	**0.1369**	**7.4000e-004**	**0.1377**	**0.0363**	**6.8000e-004**	**0.0370**		**116.9605**	**116.9605**	**4.4700e-003**	**3.9000e-003**	**118.2347**

Mitigated Construction On-Site

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

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0576	0.0404	0.4612	1.1500e-003	0.1369	7.4000e-004	0.1377	0.0363	6.8000e-004	0.0370		116.9605	116.9605	4.4700e-003	3.9000e-003	118.2347
Total	**0.0576**	**0.0404**	**0.4612**	**1.1500e-003**	**0.1369**	**7.4000e-004**	**0.1377**	**0.0363**	**6.8000e-004**	**0.0370**		**116.9605**	**116.9605**	**4.4700e-003**	**3.9000e-003**	**118.2347**

3.4 Grading - 2022

Unmitigated Construction On-Site

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

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.0480**	**0.0337**	**0.3843**	**9.6000e-004**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**97.4671**	**97.4671**	**3.7200e-003**	**3.2500e-003**	**98.5290**

Mitigated Construction On-Site

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

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.0480**	**0.0337**	**0.3843**	**9.6000e-004**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**97.4671**	**97.4671**	**3.7200e-003**	**3.2500e-003**	**98.5290**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.3275					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4303**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.0480**	**0.0337**	**0.3843**	**9.6000e-004**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**97.4671**	**97.4671**	**3.7200e-003**	**3.2500e-003**	**98.5290**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.660 3	2,207.660 3	0.7140		2,225.510 4
Paving	0.3275					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4303**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.660 3**	**2,207.660 3**	**0.7140**		**2,225.510 4**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0337	0.3843	9.6000e-004	0.1141	6.2000e-004	0.1147	0.0303	5.7000e-004	0.0308		97.4671	97.4671	3.7200e-003	3.2500e-003	98.5290
Total	**0.0480**	**0.0337**	**0.3843**	**9.6000e-004**	**0.1141**	**6.2000e-004**	**0.1147**	**0.0303**	**5.7000e-004**	**0.0308**		**97.4671**	**97.4671**	**3.7200e-003**	**3.2500e-003**	**98.5290**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

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

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

3.6 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0681	1.8721	0.5480	6.3200e-003	0.1928	0.0171	0.2099	0.0555	0.0163	0.0718		677.1022	677.1022	0.0176	0.0993	707.1447
Worker	0.2593	0.1820	2.0752	5.1700e-003	0.6162	3.3400e-003	0.6195	0.1634	3.0800e-003	0.1665		526.3221	526.3221	0.0201	0.0176	532.0563
Total	**0.3274**	**2.0541**	**2.6232**	**0.0115**	**0.8090**	**0.0204**	**0.8294**	**0.2189**	**0.0194**	**0.2383**		**1,203.4243**	**1,203.4243**	**0.0378**	**0.1169**	**1,239.2010**

Mitigated Construction On-Site

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

3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0681	1.8721	0.5480	6.3200e-003	0.1928	0.0171	0.2099	0.0555	0.0163	0.0718		677.1022	677.1022	0.0176	0.0993	707.1447
Worker	0.2593	0.1820	2.0752	5.1700e-003	0.6162	3.3400e-003	0.6195	0.1634	3.0800e-003	0.1665		526.3221	526.3221	0.0201	0.0176	532.0563
Total	**0.3274**	**2.0541**	**2.6232**	**0.0115**	**0.8090**	**0.0204**	**0.8294**	**0.2189**	**0.0194**	**0.2383**		**1,203.4243**	**1,203.4243**	**0.0378**	**0.1169**	**1,239.2010**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8286					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**13.0331**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0512	0.0359	0.4099	1.0200e-003	0.1217	6.6000e-004	0.1224	0.0323	6.1000e-004	0.0329		103.9649	103.9649	3.9700e-003	3.4700e-003	105.0976
Total	**0.0512**	**0.0359**	**0.4099**	**1.0200e-003**	**0.1217**	**6.6000e-004**	**0.1224**	**0.0323**	**6.1000e-004**	**0.0329**		**103.9649**	**103.9649**	**3.9700e-003**	**3.4700e-003**	**105.0976**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8286					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**13.0331**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0512	0.0359	0.4099	1.0200e-003	0.1217	6.6000e-004	0.1224	0.0323	6.1000e-004	0.0329		103.9649	103.9649	3.9700e-003	3.4700e-003	105.0976
Total	**0.0512**	**0.0359**	**0.4099**	**1.0200e-003**	**0.1217**	**6.6000e-004**	**0.1224**	**0.0323**	**6.1000e-004**	**0.0329**		**103.9649**	**103.9649**	**3.9700e-003**	**3.4700e-003**	**105.0976**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0484	3.0934	21.2934	0.0409	4.3066	0.0335	4.3401	1.1483	0.0313	1.1796		4,213.838 4	4,213.838 4	0.3097	0.2222	4,287.790 0
Unmitigated	2.0687	3.1436	21.6211	0.0417	4.3945	0.0341	4.4286	1.1718	0.0319	1.2036		4,297.443 1	4,297.443 1	0.3136	0.2257	4,372.538 4

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	716.41	716.41	716.41	2,083,550	2,041,879
Total	716.41	716.41	716.41	2,083,550	2,041,879

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	10.00	5.00	6.50	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507
Unrefrigerated Warehouse-No Rail	0.538353	0.056973	0.184081	0.133246	0.026575	0.006093	0.013235	0.009306	0.000942	0.000548	0.026135	0.001006	0.003507

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
NaturalGas Unmitigated	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	183.542	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Total		**1.9800e-003**	**0.0180**	**0.0151**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**		**21.5932**	**21.5932**	**4.1000e-004**	**4.0000e-004**	**21.7215**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.183542	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003		21.5932	21.5932	4.1000e-004	4.0000e-004	21.7215
Total		**1.9800e-003**	**0.0180**	**0.0151**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**		**21.5932**	**21.5932**	**4.1000e-004**	**4.0000e-004**	**21.7215**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Unmitigated	3.2996	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3515					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.6100e-003	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Total	**3.2996**	**2.6000e-004**	**0.0282**	**0.0000**		**1.0000e-004**	**1.0000e-004**		**1.0000e-004**	**1.0000e-004**		**0.0603**	**0.0603**	**1.6000e-004**		**0.0643**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3515					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.6100e-003	2.6000e-004	0.0282	0.0000		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004		0.0603	0.0603	1.6000e-004		0.0643
Total	**3.2996**	**2.6000e-004**	**0.0282**	**0.0000**		**1.0000e-004**	**1.0000e-004**		**1.0000e-004**	**1.0000e-004**		**0.0603**	**0.0603**	**1.6000e-004**		**0.0643**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	3	8.00	260	89	0.20	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Forklifts	0.3076	2.8790	3.4344	4.5900e-003		0.1779	0.1779		0.1637	0.1637	0.0000	444.0925	444.0925	0.1436		447.6832
Total	**0.3076**	**2.8790**	**3.4344**	**4.5900e-003**		**0.1779**	**0.1779**		**0.1637**	**0.1637**	**0.0000**	**444.0925**	**444.0925**	**0.1436**		**447.6832**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Osage Warehouse

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

Sacramento Metropolitan AQMD Air District, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Osage Warehouse

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

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Excavators	Diesel	No Change	0	4	No Change	0.00
Forklifts	Diesel	No Change	0	3	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	2	No Change	0.00
Paving Equipment	Diesel	No Change	0	2	No Change	0.00
Rollers	Diesel	No Change	0	2	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	6	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	10	No Change	0.00
Welders	Diesel	No Change	0	1	No Change	0.00

Osage Warehouse

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

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	1.02300E-002	7.04200E-002	9.06800E-002	1.50000E-004	4.09000E-003	4.09000E-003	0.00000E+000	1.27663E+001	1.27663E+001	8.30000E-004	0.00000E+000	1.27871E+001
Concrete/Industrial Saws	8.90000E-004	7.00000E-003	9.16000E-003	2.00000E-005	3.80000E-004	3.80000E-004	0.00000E+000	1.34414E+000	1.34414E+000	7.00000E-005	0.00000E+000	1.34597E+000
Cranes	1.63200E-002	1.83060E-001	8.27900E-002	2.50000E-004	7.60000E-003	6.99000E-003	0.00000E+000	2.21796E+001	2.21796E+001	7.17000E-003	0.00000E+000	2.23589E+001
Excavators	5.06000E-003	4.44200E-002	8.13800E-002	1.30000E-004	2.15000E-003	1.98000E-003	0.00000E+000	1.13402E+001	1.13402E+001	3.67000E-003	0.00000E+000	1.14319E+001
Forklifts	1.70400E-002	1.58230E-001	1.73060E-001	2.30000E-004	1.04800E-002	9.64000E-003	0.00000E+000	2.01437E+001	2.01437E+001	6.51000E-003	0.00000E+000	2.03066E+001
Generator Sets	1.65000E-002	1.46410E-001	1.83800E-001	3.30000E-004	7.35000E-003	7.35000E-003	0.00000E+000	2.82604E+001	2.82604E+001	1.34000E-003	0.00000E+000	2.82939E+001
Graders	7.26000E-003	9.20100E-002	3.01300E-002	1.20000E-004	2.93000E-003	2.69000E-003	0.00000E+000	1.01808E+001	1.01808E+001	3.29000E-003	0.00000E+000	1.02631E+001
Pavers	2.07000E-003	2.09900E-002	2.88400E-002	5.00000E-005	1.00000E-003	9.20000E-004	0.00000E+000	4.13003E+000	4.13003E+000	1.34000E-003	0.00000E+000	4.16342E+000
Paving Equipment	1.78000E-003	1.73800E-002	2.54600E-002	4.00000E-005	8.50000E-004	7.80000E-004	0.00000E+000	3.57856E+000	3.57856E+000	1.16000E-003	0.00000E+000	3.60749E+000
Rollers	1.66000E-003	1.72600E-002	1.86000E-002	3.00000E-005	9.90000E-004	9.20000E-004	0.00000E+000	2.30519E+000	2.30519E+000	7.50000E-004	0.00000E+000	2.32383E+000
Rubber Tired Dozers	3.13900E-002	3.29760E-001	1.34320E-001	3.20000E-004	1.56500E-002	1.44000E-002	0.00000E+000	2.81353E+001	2.81353E+001	9.10000E-003	0.00000E+000	2.83628E+001
Tractors/Loaders/Backhoes	3.35600E-002	3.41410E-001	4.55980E-001	6.30000E-004	1.83600E-002	1.68900E-002	0.00000E+000	5.56807E+001	5.56807E+001	1.80100E-002	0.00000E+000	5.61309E+001
Welders	1.38400E-002	7.31400E-002	8.47900E-002	1.30000E-004	3.19000E-003	3.19000E-003	0.00000E+000	9.41103E+000	9.41103E+000	1.13000E-003	0.00000E+000	9.43918E+000

Osage Warehouse

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

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	1.02300E-002	7.04200E-002	9.06800E-002	1.50000E-004	4.09000E-003	4.09000E-003	0.00000E+000	1.27663E+001	1.27663E+001	8.30000E-004	0.00000E+000	1.27870E+001
Concrete/Industrial Saws	8.90000E-004	7.00000E-003	9.16000E-003	2.00000E-005	3.80000E-004	3.80000E-004	0.00000E+000	1.34414E+000	1.34414E+000	7.00000E-005	0.00000E+000	1.34597E+000
Cranes	1.63200E-002	1.83060E-001	8.27900E-002	2.50000E-004	7.60000E-003	6.99000E-003	0.00000E+000	2.21796E+001	2.21796E+001	7.17000E-003	0.00000E+000	2.23589E+001
Excavators	5.06000E-003	4.44200E-002	8.13800E-002	1.30000E-004	2.15000E-003	1.98000E-003	0.00000E+000	1.13401E+001	1.13401E+001	3.67000E-003	0.00000E+000	1.14318E+001
Forklifts	1.70400E-002	1.58230E-001	1.73060E-001	2.30000E-004	1.04800E-002	9.64000E-003	0.00000E+000	2.01437E+001	2.01437E+001	6.51000E-003	0.00000E+000	2.03065E+001
Generator Sets	1.65000E-002	1.46410E-001	1.83800E-001	3.30000E-004	7.35000E-003	7.35000E-003	0.00000E+000	2.82603E+001	2.82603E+001	1.34000E-003	0.00000E+000	2.82939E+001
Graders	7.26000E-003	9.20100E-002	3.01300E-002	1.20000E-004	2.93000E-003	2.69000E-003	0.00000E+000	1.01808E+001	1.01808E+001	3.29000E-003	0.00000E+000	1.02631E+001
Pavers	2.07000E-003	2.09900E-002	2.88400E-002	5.00000E-005	1.00000E-003	9.20000E-004	0.00000E+000	4.13003E+000	4.13003E+000	1.34000E-003	0.00000E+000	4.16342E+000
Paving Equipment	1.78000E-003	1.73800E-002	2.54600E-002	4.00000E-005	8.50000E-004	7.80000E-004	0.00000E+000	3.57855E+000	3.57855E+000	1.16000E-003	0.00000E+000	3.60749E+000
Rollers	1.66000E-003	1.72600E-002	1.86000E-002	3.00000E-005	9.90000E-004	9.20000E-004	0.00000E+000	2.30519E+000	2.30519E+000	7.50000E-004	0.00000E+000	2.32383E+000
Rubber Tired Dozers	3.13900E-002	3.29760E-001	1.34320E-001	3.20000E-004	1.56500E-002	1.44000E-002	0.00000E+000	2.81352E+001	2.81352E+001	9.10000E-003	0.00000E+000	2.83627E+001
Tractors/Loaders/Backhoes	3.35600E-002	3.41410E-001	4.55980E-001	6.30000E-004	1.83600E-002	1.68900E-002	0.00000E+000	5.56806E+001	5.56806E+001	1.80100E-002	0.00000E+000	5.61308E+001
Welders	1.38400E-002	7.31400E-002	8.47900E-002	1.30000E-004	3.19000E-003	3.19000E-003	0.00000E+000	9.41102E+000	9.41102E+000	1.13000E-003	0.00000E+000	9.43917E+000

Osage Warehouse

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

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.56663E-006	1.56663E-006	0.00000E+000	0.00000E+000	1.56408E-006
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	9.01730E-007	9.01730E-007	0.00000E+000	0.00000E+000	1.34175E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.76364E-006	1.76364E-006	0.00000E+000	0.00000E+000	1.74950E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.48930E-006	1.48930E-006	0.00000E+000	0.00000E+000	1.47735E-006
Generator Sets	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.06156E-006	1.06156E-006	0.00000E+000	0.00000E+000	1.06030E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	9.82244E-007	9.82244E-007	0.00000E+000	0.00000E+000	9.74365E-007
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.79442E-006	2.79442E-006	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.06628E-006	1.06628E-006	0.00000E+000	0.00000E+000	1.41030E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.07757E-006	1.07757E-006	0.00000E+000	0.00000E+000	1.24709E-006
Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.06258E-006	1.06258E-006	0.00000E+000	0.00000E+000	1.05941E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction		PM2.5 Reduction			

Osage Warehouse

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

No	Replace Ground Cover of Area Disturbed	PM10 Reduction		PM2.5 Reduction			
No	Water Exposed Area	PM10 Reduction		PM2.5 Reduction		Frequency (per day)	
No	Unpaved Road Mitigation	Moisture Content %		Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.04	0.01	0.04	0.01	0.00	0.00
Demolition	Fugitive Dust	0.01	0.00	0.01	0.00	0.00	0.00
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.12	0.06	0.12	0.06	0.00	0.00
Grading	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.10	0.05	0.10	0.05	0.00	0.00
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Osage Warehouse

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

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.92	1.60	1.59	1.94	1.78	1.90	0.00	1.95	1.95	1.31	1.58	1.94
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting: Suburban Center

Mitigation Selected	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.07	0.26		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			

Osage Warehouse

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

Yes	Neighborhood Enhancements	Improve Pedestrian Network	2.00	Project Site and Connecting Off-Site		
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.02			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.02			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"	4.50			
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	

Osage Warehouse

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

No	Commute	Provide Ride Sharing Program	10.00			
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.02			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	100.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	100.00
No	Use Low VOC Paint (Parking)	100.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		

Osage Warehouse

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

No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
Yes	Apply Water Conservation on Strategy		20.00
No	Use Reclaimed Water	0.00	0.00
No	Use Grey Water	0.00	
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction	0.00	
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape	0.00	0.00

Solid Waste Mitigation

Osage Warehouse

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

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

APPENDIX B
ENVIRONMENTAL NOISE ASSESSMENT

Environmental Noise Assessment

Osage Warehouse

City of Sacramento, California

May 9, 2022

Project #210802

Prepared for:

Raney Planning & Management
1501 Sports Drive, Suite A
Sacramento, CA 95834

Prepared by:

Saxelby Acoustics LLC

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE)

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INTRODUCTION

The Osage Warehouse project includes the construction of a single 115,468 sqft. warehouse on a previously vacant parcel. The project is located at the northeast corner of the intersection of South Watt Avenue and Osage Avenue in the City of Sacramento, California. The project will include 116 auto parking stalls and 18 loading dock spaces. Surrounding land uses include commercial uses to the north and west and single family residential uses to the south and east of the project site. While the project is located within the boundaries of the City of Sacramento, the adjacent sensitive receptors are located outside of the City boundaries but within the County of Sacramento Boundaries.

Figure 1 shows the project site plan. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

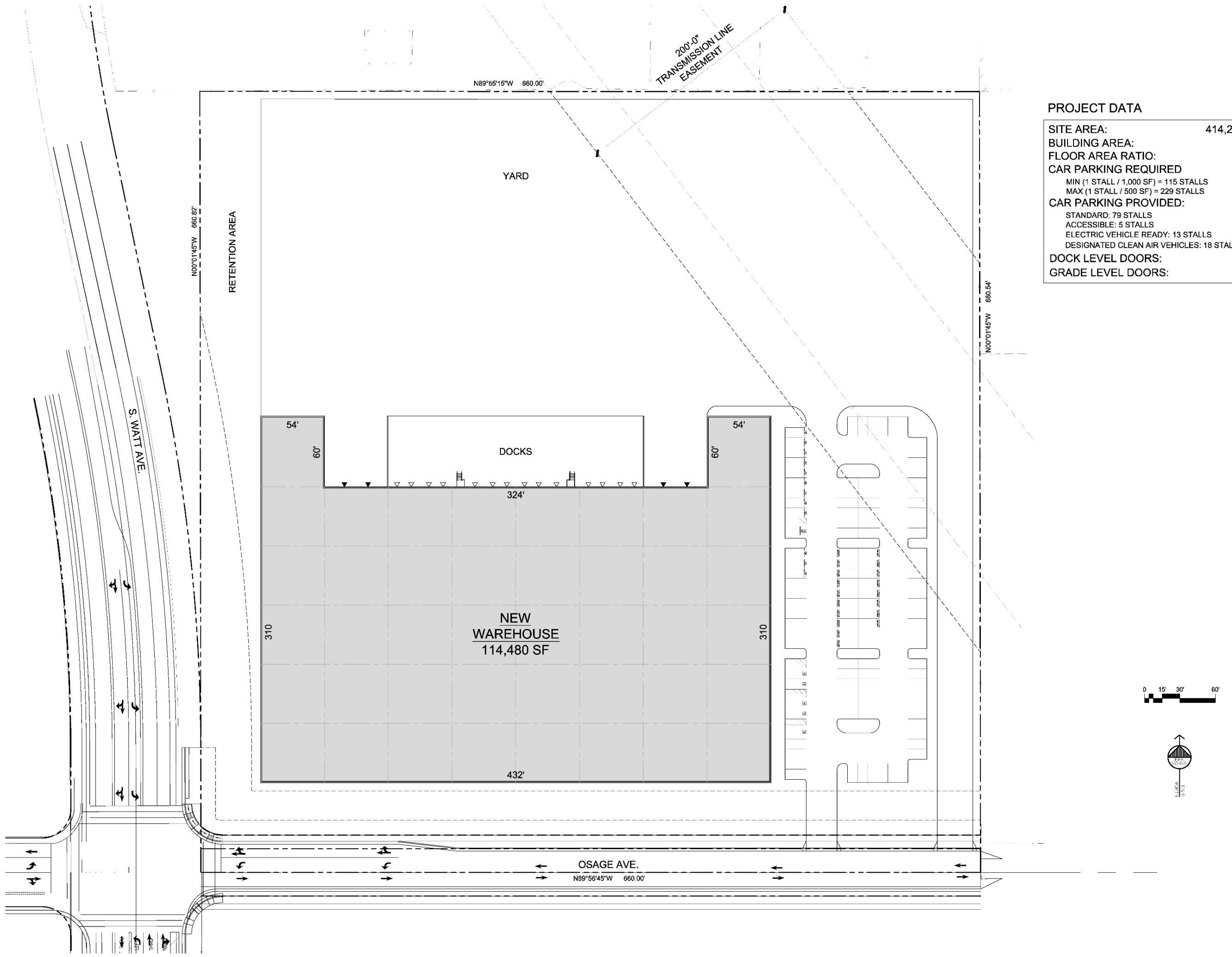
Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.



PROJECT DATA

SITE AREA:	414,293 SF (9.51 AC)
BUILDING AREA:	114,480 SF
FLOOR AREA RATIO:	0.28
CAR PARKING REQUIRED	115 STALLS
MIN (1 STALL / 1,000 SF) = 115 STALLS	
MAX (1 STALL / 500 SF) = 229 STALLS	
CAR PARKING PROVIDED:	115 STALLS
STANDARD: 79 STALLS	
ACCESSIBLE: 5 STALLS	
ELECTRIC VEHICLE READY: 13 STALLS	
DESIGNATED CLEAN AIR VEHICLES: 18 STALLS	
DOCK LEVEL DOORS:	14
GRADE LEVEL DOORS:	4

CONCEPTUAL SITE PLAN

OSAGE AVE.
SACRAMENTO, CA 95829

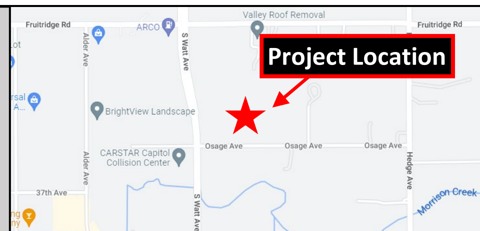
PANATTONI
VITAE

Osage Warehouse

City of Sacramento, California

Figure 1

Project Site Plan



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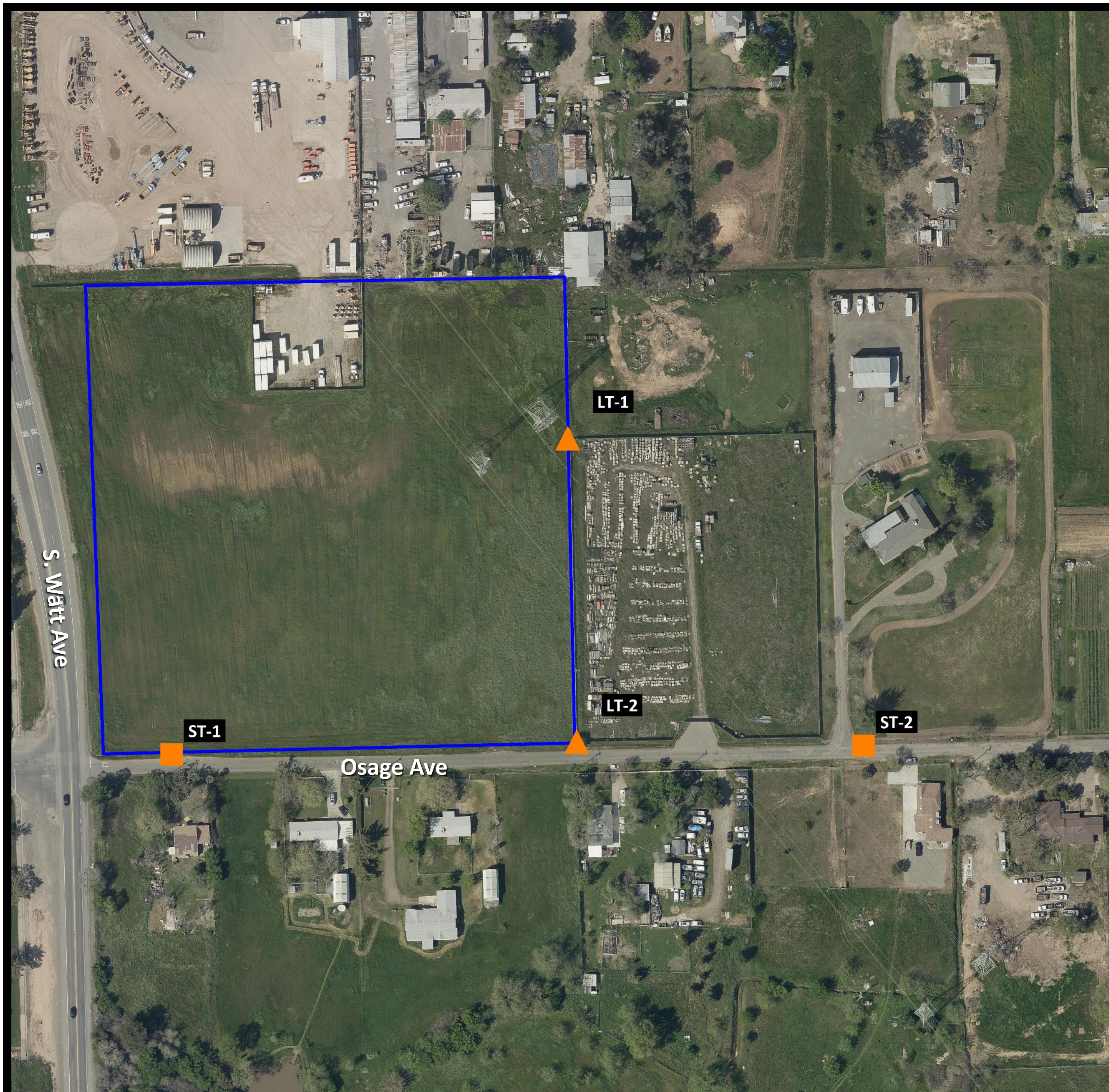

Osage Warehouse

City of Sacramento, California

Figure 2

Noise Measurement Sites

Legend

Project Site

Noise Measurement Site - Long Term

Noise Measurement Site - Short Term

50 ft 150 ft 250 ft 350 ft

Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 05/09/2022

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The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING AND FUTURE NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located west and south of the project site.

EXISTING GENERAL AMBIENT NOISE LEVELS

The existing ambient noise environment in the project vicinity is primarily defined by traffic on South Watt Avenue. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at two locations on the project site and short-term noise level measurements at two locations. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 and 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a B&K Model 4230 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Location	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1: 735 ft. to CL of South Watt Ave.	8/19/21	59	53	51	66	53	51	64
LT-2: 690 ft. to CL of South Watt Ave.	8/19/21	59	53	51	66	53	51	64
ST-1: 140 ft. to CL of South Watt Ave.	8/20/21	N/A	62	61	54	N/A	N/A	N/A
ST-2: 1,080 ft. to CL of South Watt Ave.	8/20/21	N/A	50	49	47	N/A	N/A	N/A

Notes:

- *All values shown in dBA*
- *Daytime hours: 7:00 a.m. to 10:00 p.m.*
- *Nighttime Hours: 10:00 p.m. to 7:00 a.m.*
- *Source: Saxelby Acoustics 2022*

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

Off-Site Traffic Noise Impact Assessment Methodology

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for project and no-project conditions.

Existing and Existing Plus Project noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (DKS Associates 2021), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing and Existing Plus Project conditions are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Table 3 summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling. Based upon the data in **Table 3**, the proposed project is predicted to result in a maximum traffic noise level increase of 1.4 dBA.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Osage Ave.	East of S Watt Ave.	67.4	67.9	0.5
Osage Ave.	West of Project Driveway	62.5	62.5	0.0
Osage Ave.	Project Driveway	60.0	61.4	1.4

EVALUATION OF PROJECT OPERATIONAL NOISE AT RESIDENTIAL RECEPTORS

Loading Dock and Truck Circulation Noise Generation

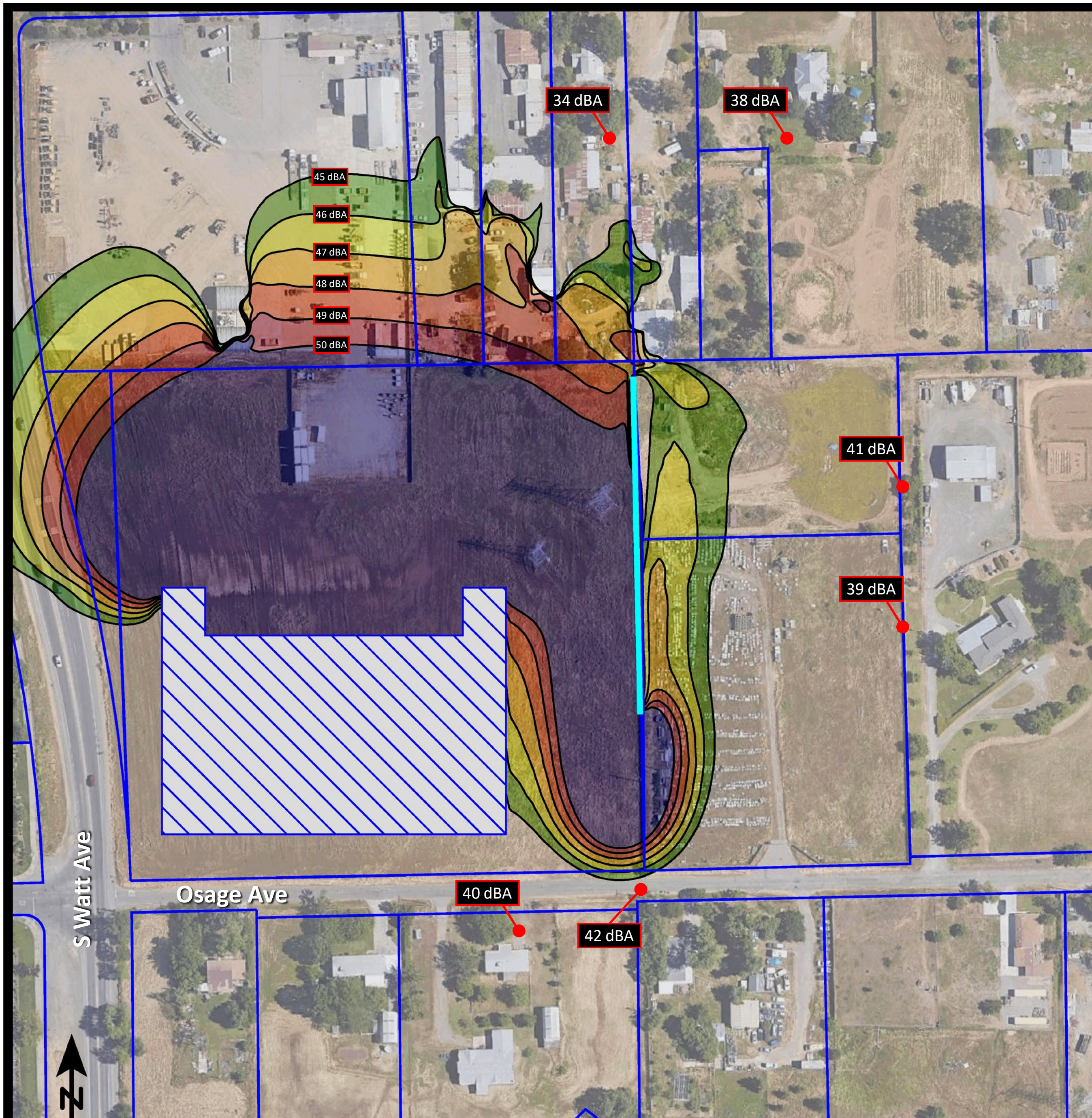
To determine typical loading dock noise levels associated with the proposed loading docks, noise level measurement data from a Restaurant Depot warehouse was used. The noise level measurements were conducted at a distance of 100 feet from the center of the loading dock area. This noise measurement location was located at the boundary of the truck maneuvering lanes. Activities during the peak hour of loading dock activities included truck arrival/departures, truck idling, truck backing, air brake release, and operation of truck-mounted refrigeration units.

The results of the loading dock noise measurements indicate that a busy hour generated an average noise level of 64 dBA L_{50} and 92 dBA L_{max} at the boundary of the truck maneuvering lanes. This analysis conservatively assumes that the proposed loading docks could operate at this level of activity continuously.

Parking Lot Circulation

The proposed project will provide parking stalls for 116 passenger vehicles. Saxelby Acoustics conservatively assumed that in a busy hour every parking stall on site could fill or empty, resulting in a peak hour movement of 116 vehicles on site. Based upon noise measurements conducted of vehicle movements in parking lots, the sound exposure level (SEL) for a single passenger vehicle is 71 dBA at a distance of 50 feet.

Saxelby Acoustics used the SoundPLAN noise model to calculate noise levels at the nearest sensitive receptors. Input data included the loading docks and parking lot noise generation, as discussed above. The project noise level contours for the nighttime (10:00 p.m. to 7:00 a.m.) median (L_{50}) and maximum (L_{max}) are shown in **Figure 3** and **Figure 4**, respectively.



Osage Warehouse

City of Sacramento, California

Figure 3

Nighttime Median Project Noise Contours (dBA L_{50})

Signs and symbols

- Parcel Boundary
- 8-Foot Wall
- Proposed Building

Levels in dB(A)

Levels in dB(A)
<= 45
45 - 46
46 - 47
47 - 48
48 - 49
49 - 50
> 50

1 : 2200

0 10 20 40 60 80 m

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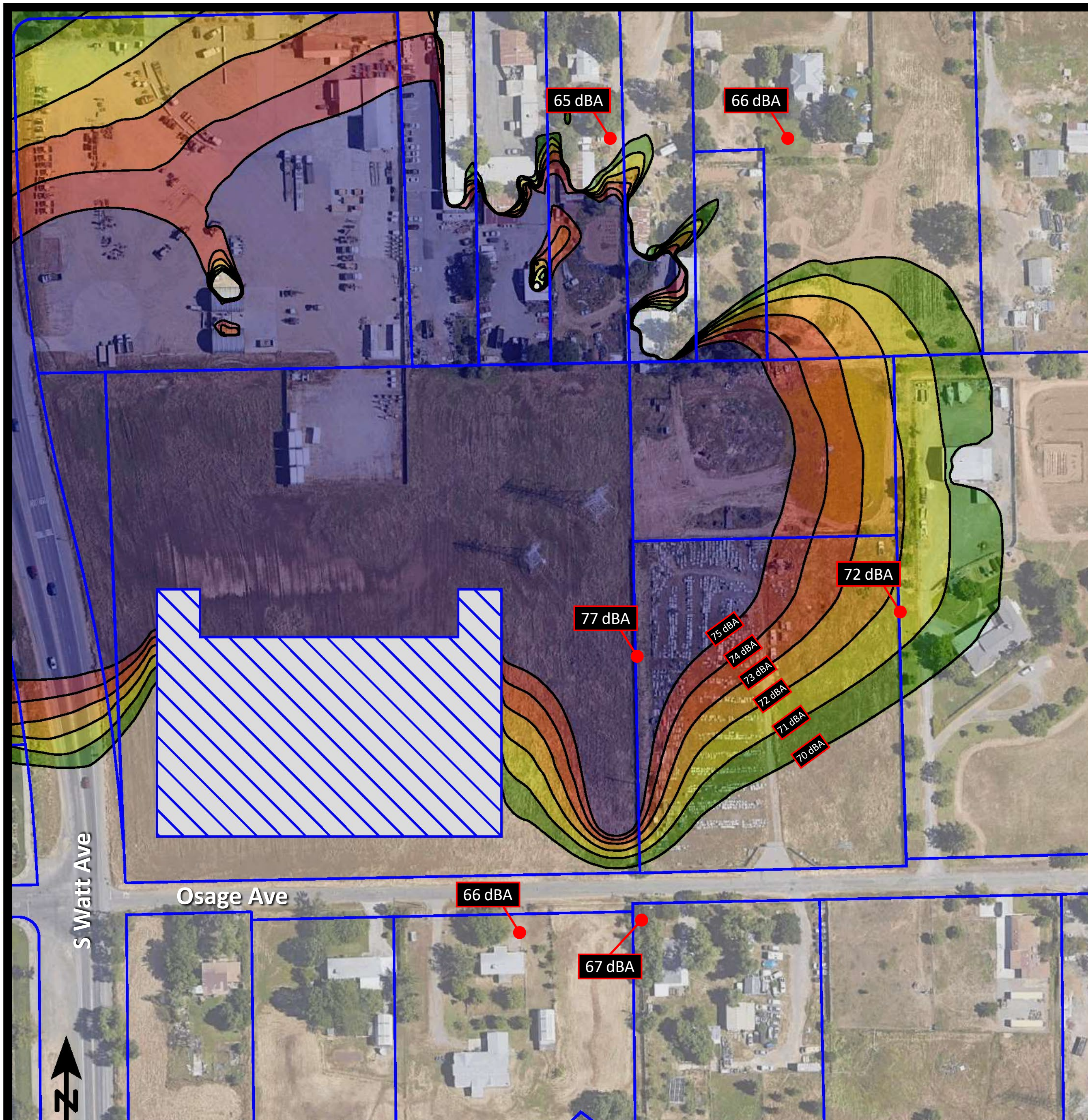

Osage Warehouse

City of Sacramento, California

Figure 4

Nighttime Maximum Project Noise Contours (dBA L_{max})

Signs and symbols

Parcel Boundary

Proposed Building

Levels in dB(A)

<= 70
70 - 71
71 - 72
72 - 73
73 - 74
74 - 75
> 75

1 : 2200

0 10 20 40 60 80 m

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CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table** Error! Reference source not found.**4**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 4: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 5** shows the typical vibration levels produced by construction equipment.

TABLE 5: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

There are no state regulations related to noise that apply to the Proposed Project.

LOCAL

City of Sacramento General Plan

The Noise Element of the City's General Plan identifies noise and land use compatibility standards for various land uses. The City's goal is to minimize noise impacts on human activity to ensure the health and safety of the community. **Table 6** below shows exterior noise compatibility standards for various land uses.

TABLE 6: CITY OF SACRAMENTO EXTERIOR NOISE COMPATIBILITY STANDARDS FOR VARIOUS LAND USES

Land Use Type	Highest Level of Noise Exposure that is Regarded as "Normally Acceptable"[a] (L_{dn}[b] or CNEL[c])
Residential - Low Density Single Family, Duplex, Mobile Homes	60 dBA[d,e]
Residential – Multi-family	65 dBA
Urban Residential Infill[f] and Mixed-Use Projects[g]	70 dBA
Transient Lodging – Motels, Hotels	65 dBA
Schools, Libraries, Churches, Hospitals, Nursing Homes	70 dBA
Auditoriums, Concert Halls, Amphitheaters	Mitigation based on site-specific study
Sports Arena, Outdoor Spectator Sports	Mitigation based on site-specific study
Playgrounds, Neighborhood Parks	70 dBA
Golf Courses, Riding Stables, Water Recreation, Cemeteries	75 dBA
Office Buildings – Business, Commercial and Professional	70 dBA
Industrial, Manufacturing, Utilities, Agriculture	75 dBA

Source: Governor's Office of Planning and Research, *State of California General Plan Guidelines 2003,* October 2003
a. As defined in the Guidelines, "Normally Acceptable" means that the "specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements."
b. L_{dn} of Day Night Average Level is an average 24-hour noise measurement that factors in day and night noise levels.
c. CNEL or Community Noise Equivalent Level measurements are a weighted average of sound levels gathered throughout a 24-hour period.
d. dBA or A-weighted decibel scale is a measurement of noise levels.
e. The exterior noise standard for the residential area west of McClellan Airport known as McClellan Heights/Parker Homes is 65 dBA.
f. With land use designations of Central business District, Urban Neighborhood (Low, Medium, or High) Urban Center (Low or High), Urban Corridor (Low or High).
g. All mixed-use projects located anywhere in the City of Sacramento.

City of Sacramento Municipal Code

The City of Sacramento Municipal Code, Section 8.68.060 establishes and allowable exterior noise level limit of 55 dBA L_{50} and 75 dBA L_{max} during daytime (7:00 a.m. to 10:00 p.m.) hours and 50 dBA L_{50} and 70 dBA L_{max} during nighttime (10:00 p.m. to 7:00 a.m.) for sources of noise which occur for more than 30 minutes per hour (L_{50}).

If the existing ambient noise level exceeds the 50/55 dBA L_{50} standard the allowable limit is increased in five dBA increments to encompass the ambient noise level. If the existing ambient noise level exceeds the 70/75 dBA L_{max} noise standard, the limit becomes the measured L_{max} existing ambient noise level. For example, if measured existing ambient daytime noise levels are 57 dBA L_{50} and 77 dBA L_{max}, the noise ordinance limits would be 60 dBA L_{50} and 77 dBA L_{max}.

The City of Sacramento Municipal Code standards are summarized in **Table 7** below.

TABLE 7: STATIONARY NOISE SOURCE NOISE STANDARDS

Noise Level Descriptor	Outdoor Activity Areas Daytime (7 a.m. to 10 p.m.)	Outdoor Activity Areas Nighttime (10 p.m. to 7 a.m.)
Hourly equivalent sound level (L_{50}), dB	55	50
Maximum sound level (L_{max}), dB	75	70

Source: City of Sacramento Municipal Code

County of Sacramento General Plan

The County of Sacramento General Plan Noise Element Table 2 (listed in **Table 3** below) establishes an acceptable exterior noise level of 55 dBA L_{50} for daytime (7:00 a.m. to 10:00 p.m.) and 50 dBA L_{50} for nighttime (10:00 p.m. to 7:00 a.m.) for non-transportation noise sources. The standards are reduced by 5 dB for sounds consisting primarily of speech or music, such as a speaker in a drive-thru.

TABLE 8: SACRAMENTO COUNTY GENERAL PLAN NON-TRANSPORTATION NOISE STANDARDS

	Outdoor Area[2]		Interior[3]	
Receiving Land Use	**Daytime**	**Nighttime**	**Interior Day & Night**	**Notes**
All Residential	55 / 75	50 / 70	35 / 55	
Transient Lodging	55 / 75	-----	35 / 55	4
Hospitals & Nursing Home	55 / 75	-----	35 / 55	5, 6
Theaters & Auditoriums	-----	-----	30 / 50	6
Churches, Meeting Halls, Schools, Libraries, etc.	55 / 75	-----	35 / 60	6
Office Buildings	60 / 75	-----	45 / 65	6
Commercial Buildings	-----	-----	45 / 65	6
Playgrounds, Parks, etc.	60 / 75	-----	-----	6
Industry	60 / 80	-----	50 / 70	6

Notes:

1. The Table 2 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards of Table 2, then the noise level standards shall be increased at 5 dB increments to encompass theambient.
2. Sensitive areas are defined acoustic terminology section.
3. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.
4. Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.
5. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff orpatients.
6. The outdoor activity areas of these uses (if any), are not typically utilized during nighttime hours.
7. Where median (L50) noise level data is not available for a particular noise source, average (Leq) values may be substituted for the standards of this table provided the noise source in question operates for at least 30 minutes of an hour. If the source in question operates less than 30 minutes per hour, then the maximum noise level standards shown wouldapply.
8.

Source: Sacramento County General Plan Noise Element, 2011. Accessed November, 2019.

County of Sacramento Noise Ordinance

The County of Sacramento Noise Ordinance provides an exterior noise level standard of 55 dBA L_{50} for daytime (7:00 a.m. to 10:00 p.m.) and an exterior noise level standard of 50 dBA L_{50} for nighttime (10:00 p.m. to 7:00 a.m.) for residential areas. These levels are shown in **Table 4**.

If the noise source includes speech, such as from a drive-thru lane, the levels in **Table 4** are to be reduced by 5 dBA. Additionally, if the ambient noise level exceeds the permitted noise level in any of the noise level categories specified in the subdivision, the allowable noise limit shall be increased by 5 dBA increments in each category to encompass the ambient noise level.

TABLE 9: SACRAMENTO COUNTY NOISE ORDINANCE

Cumulative Duration of the Intrusive Noise	Exterior Noise Level, dB	
	Daytime	Nighttime
30 minutes per hour	55	50
15 minutes per hour	60	55
5 minutes per hour	65	60
1 minute per hour	70	65
Level not to exceed for any time per hour	75	70

Source: County of Sacramento Noise Ordinance.

Summary of Relevant Noise Level Criteria

The City of Sacramento and the County of Sacramento General Plan/Noise Ordinance share similar noise level standards for "Stationary" (non-transportation) noise sources. The project, which shall be considered to be a "Stationary" noise source, shall not be permitted to generate noise levels exceeding 55 dBA L_{50} or 75 dBA L_{max} during daytime (7:00 a.m. to 10:00 p.m.) hours and 50 dBA L_{50} or 70 dBA L_{max} during nighttime (10:00 p.m. to 7:00 a.m.) hours at the adjacent residential uses.

Criteria for Acceptable Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 8**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

TABLE 10: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" dam age and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-f]).

Would the project:

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Generate excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The City of Sacramento General Plan Noise Element specifies criteria for determination of significant noise impacts in Table EC 2, which is reproduced in **Table 9** below.

TABLE 11: EXTERIOR INCREMENTAL NOISE IMPACT STANDARDS FOR NOISE-SENSITIVE USES (DBA)

Residences and buildings where people normally sleep[a]		Institutional land uses with primarily daytime and evening uses[b]	
Existing L_{dn}	Allowable Noise Increment	Existing Peak Hour L_{eq}	Allowable Noise Increment
45	8	45	12
50	5	50	9
55	3	55	6
60	2	60	5
65	1	65	3
70	1	70	3
75	0	75	1
80	0	80	0

Source: Federal Transit Administration, Transit Noise Impact and Vibration Assessment, May 2006

a. *This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.*
b. *This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.*

Based on **Table 9**, an increase in the traffic noise level of 1 dB or more would be significant where the pre-project noise levels are less than 75 dB L_{dn}, or 2 dB or more where existing noise levels are less than 65 dB L_{dn}. Extending this concept to lower noise levels, an increase in the traffic noise level of 3 dB or more may be significant where the pre-project traffic noise level is less than 60 dB L_{dn}. The rationale for the **Table 9** criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 1: Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Traffic Noise Increases at Off-Site Receptors

The City of Sacramento General Plan Noise Element specifies criteria to determine the significance of traffic noise impacts. An increase in the traffic noise level of 1 dB or more would be significant where the pre-project noise levels are less than 75 dB L_{dn}, or 2 dB or more where existing noise levels are less than 65 dB L_{dn}.

According to **Table 3**, the maximum noise level increase along Osage Avenue is predicted to be 1.4 dBA L_{dn} near the project driveway. For this roadway segment, the existing ambient noise level at the nearest sensitive receptor is 60.0 dBA which is less than the 2 dB significant increase criterion. The highest ambient noise level of 67.4 dBA occurs directly adjacent to South Watt Avenue. The noise level increase along this segment is predicted to be 0.5 dBA which is less than the 1 dB significant increase criterion.

Therefore, impacts resulting from increased traffic noise would be considered ***less-than-significant***.

Operational Noise at Sensitive Receptors

The City of Sacramento and County of Sacramento noise level standards require that new projects in the vicinity of existing sensitive receptors generate noise levels no greater than 55 dBA L_{50} and 75 dBA L_{max} during daytime (7:00 a.m. to 10:00 p.m.) hours and 50 dBA L_{50} and 70 dBA L_{max} during nighttime (10:00 p.m. to 7:00 a.m.) hours.

As shown on **Figure 3,** the proposed project is predicted to comply with the City's daytime and nighttime (10:00 p.m. to 7:00 a.m.) L_{50} noise level standards without any additional noise control measures. However, the project will exceed the City's nighttime L_{max} standard. Therefore, impacts resulting from operational noise would be considered potentially significant and mitigation would be required.

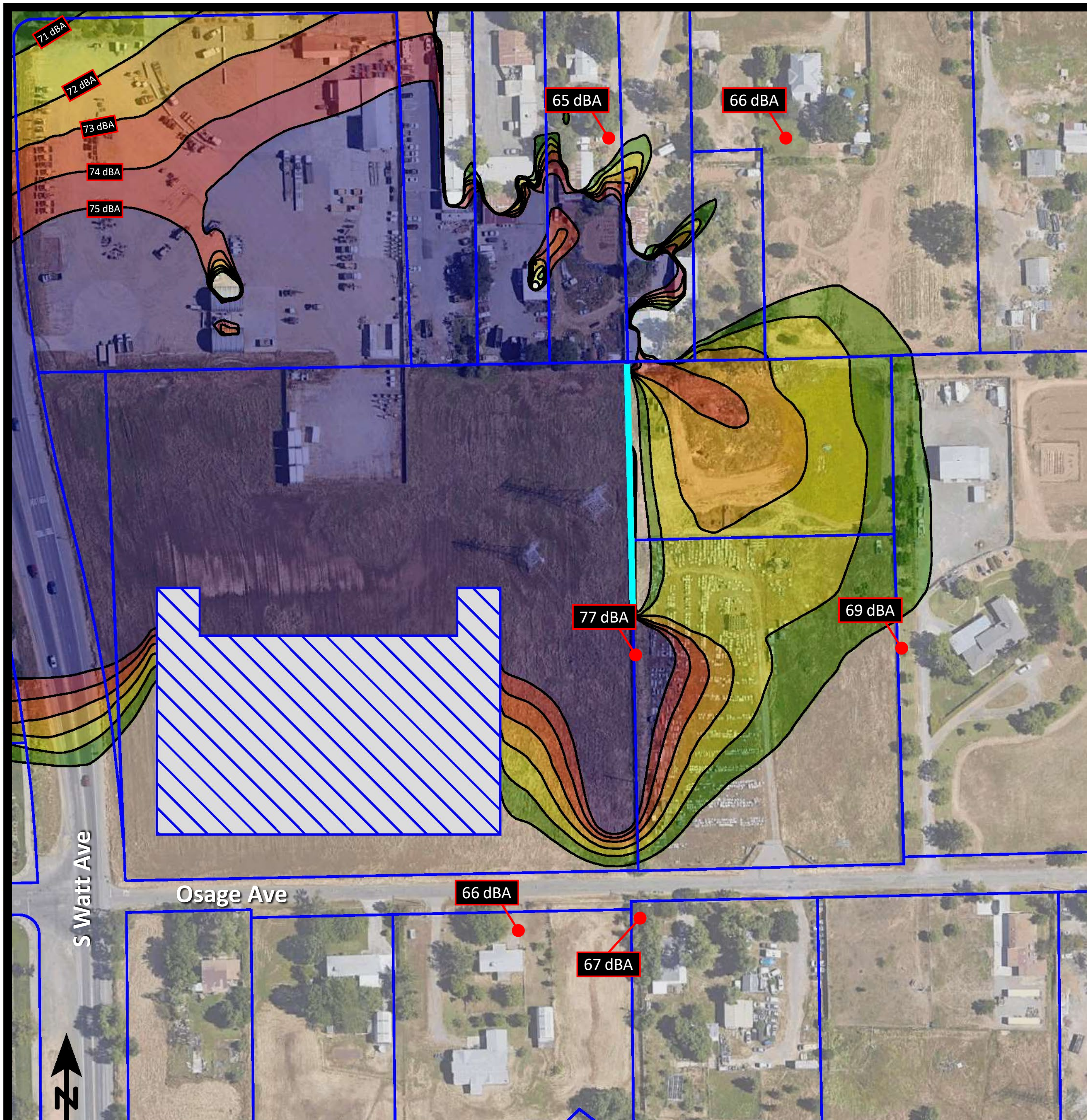
Saxelby Acoustics recommends the construction of an 8-foot-tall sound wall to reduce the maximum noise levels emanating from the project site. The wall location and resulting contours are shown on **Figure 5.** Implementation of this mitigation measure would reduce operational noise impacts to ***less-than-significant.***

Construction Noise

The noise increase during construction would be of short duration, and would likely occur primarily during daytime hours. The City of Sacramento's Noise Ordinance of the Municipal Code exempts construction activities from the noise standards, provided that construction takes place between the hours of 7:00 AM and 6:00 PM Monday through Saturday and 9:00 AM and 6:00 PM Sundays and holidays. Although the construction activities could result in infrequent periods of high noise, the construction noise would not be sustained and would only occur only during the City's permitted construction noise hours. In addition, construction noise was previously addressed in the 2001 IS/MND and the construction of the proposed project would be consistent with the type and intensity of development anticipated for the project site within the 2001 IS/MND. As a result, the proposed project would note result in noise levels during construction beyond what has been anticipated in the 2001 IS/MND, which concluded that noise impacts related to construction would be **less-than-significant**.

This is a **less-than-significant** impact, and no mitigation is required.

MM1: An 8-foot-tall sound wall shall be constructed along the eastern project boundary in order to achieve the City's exterior noise standards. Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials that achieve the required total height. Wood is not recommended due to eventual warping and degradation of acoustical performance. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. **Figure 5** shows the recommended sound wall location.



Osage Warehouse

City of Sacramento, California

Figure 5

Nighttime Maximum Project Noise Contours – Noise Protection (dBA L_{max})

Signs and symbols

Parcel Boundary

8-Foot Wall

Proposed Building

Levels in dB(A)

<= 70
70 - 71
71 - 72
72 - 73
73 - 74
74 - 75
> 75

1 : 2200

0 10 20 40 60 80 m

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Impact 2: ***Would the project generate excessive groundborne vibration or groundborne noise levels?***

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 5** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 80 feet, or further, from typical construction activities. At these distances construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required.

Impact 3: ***For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?***

There are no projects within 2 miles of the project site. Therefore, this impact is not applicable to the proposed project.

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Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

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Appendix B: Continuous and Short-Term Ambient Noise Measurement Results

Appendix B1: Continuous Noise Monitoring Results

Site: LT-1

Project: Osage Avenue Warehouse

Location: Northeastern Project Corner

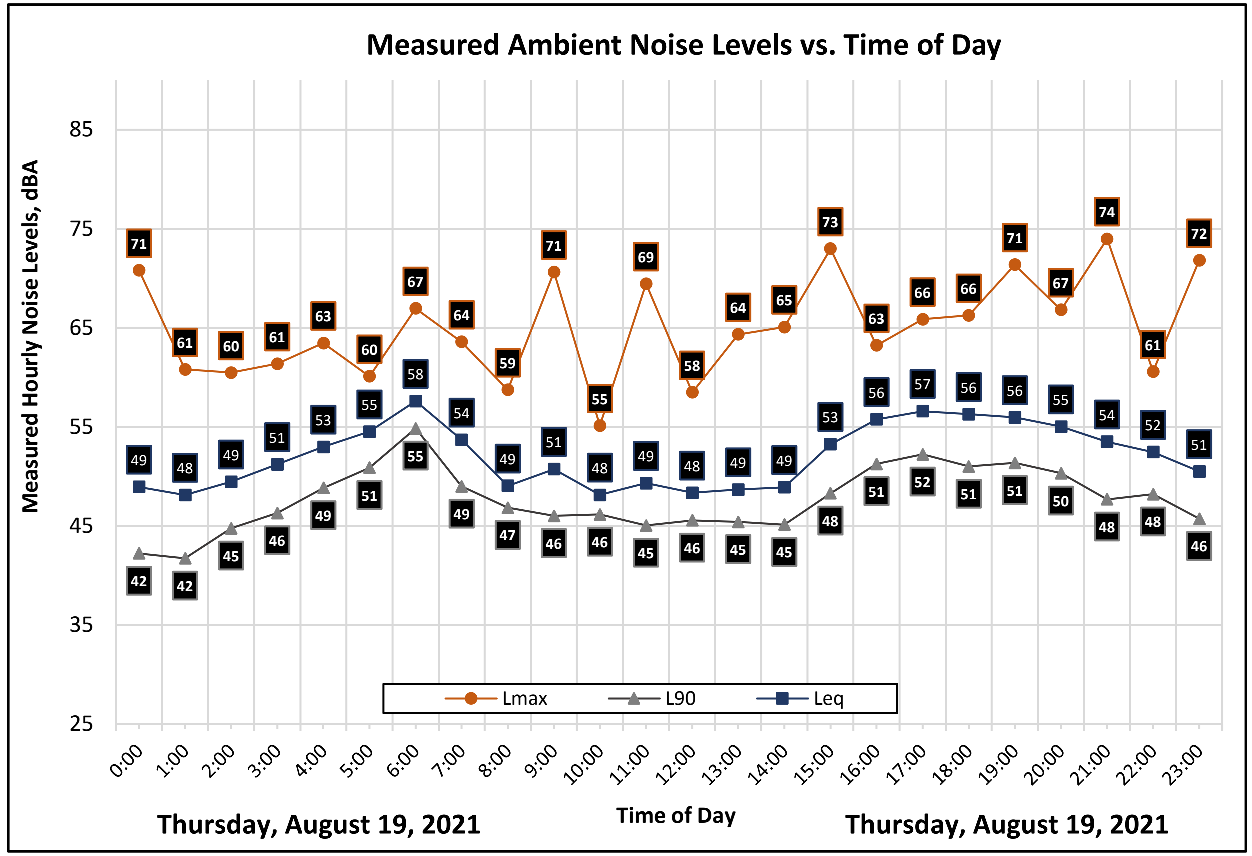
Coordinates: 38.5232982°, -121.3674273°

Meter: LDL 820-1

Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, August 19, 2021	0:00	49	71	46	42
Thursday, August 19, 2021	1:00	48	61	46	42
Thursday, August 19, 2021	2:00	49	60	48	45
Thursday, August 19, 2021	3:00	51	61	50	46
Thursday, August 19, 2021	4:00	53	63	53	49
Thursday, August 19, 2021	5:00	55	60	54	51
Thursday, August 19, 2021	6:00	58	67	57	55
Thursday, August 19, 2021	7:00	54	64	52	49
Thursday, August 19, 2021	8:00	49	59	49	47
Thursday, August 19, 2021	9:00	51	71	48	46
Thursday, August 19, 2021	10:00	48	55	48	46
Thursday, August 19, 2021	11:00	49	69	47	45
Thursday, August 19, 2021	12:00	48	58	48	46
Thursday, August 19, 2021	13:00	49	64	47	45
Thursday, August 19, 2021	14:00	49	65	48	45
Thursday, August 19, 2021	15:00	53	73	52	48
Thursday, August 19, 2021	16:00	56	63	55	51
Thursday, August 19, 2021	17:00	57	66	56	52
Thursday, August 19, 2021	18:00	56	66	56	51
Thursday, August 19, 2021	19:00	56	71	55	51
Thursday, August 19, 2021	20:00	55	67	54	50
Thursday, August 19, 2021	21:00	54	74	52	48
Thursday, August 19, 2021	22:00	52	61	52	48
Thursday, August 19, 2021	23:00	51	72	49	46

Statistics	Leq	Lmax	L50	L90
Day Average	53	66	51	48
Night Average	53	64	51	47
Day Low	48	55	47	45
Day High	57	74	56	52
Night Low	48	60	46	42
Night High	58	72	57	55
Ldn	59	Day %		68
CNEL	59	Night %		32

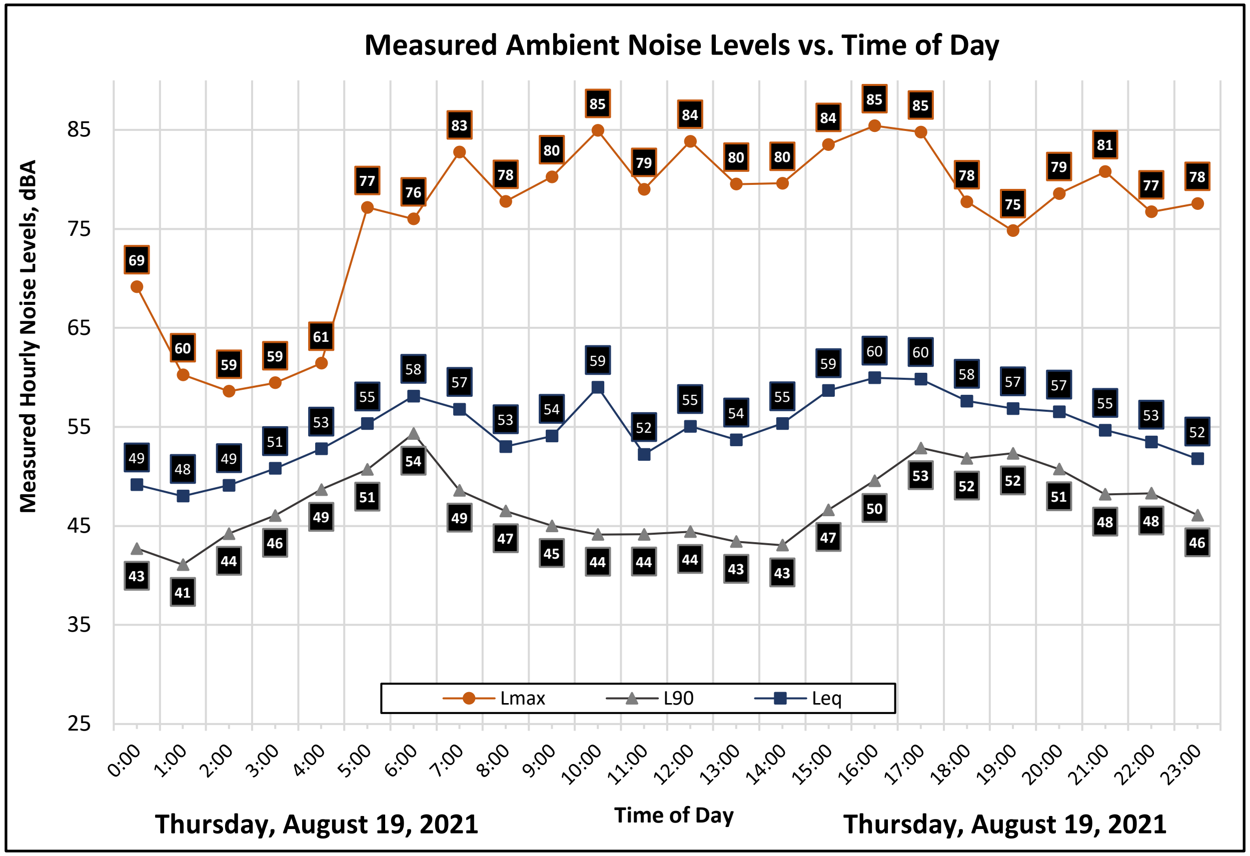


Appendix B1: Continuous Noise Monitoring Results

Site: LT-2
Project: Osage Avenue Warehouse
Location: Southeastern Project Corner
Coordinates: 38.5221596°, -121.3674102°
Meter: LDL 820-2
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, August 19, 2021	0:00	49	69	47	43
Thursday, August 19, 2021	1:00	48	60	46	41
Thursday, August 19, 2021	2:00	49	59	48	44
Thursday, August 19, 2021	3:00	51	59	50	46
Thursday, August 19, 2021	4:00	53	61	52	49
Thursday, August 19, 2021	5:00	55	77	54	51
Thursday, August 19, 2021	6:00	58	76	57	54
Thursday, August 19, 2021	7:00	57	83	52	49
Thursday, August 19, 2021	8:00	53	78	48	47
Thursday, August 19, 2021	9:00	54	80	47	45
Thursday, August 19, 2021	10:00	59	85	46	44
Thursday, August 19, 2021	11:00	52	79	47	44
Thursday, August 19, 2021	12:00	55	84	47	44
Thursday, August 19, 2021	13:00	54	80	46	43
Thursday, August 19, 2021	14:00	55	80	46	43
Thursday, August 19, 2021	15:00	59	84	50	47
Thursday, August 19, 2021	16:00	60	85	55	50
Thursday, August 19, 2021	17:00	60	85	57	53
Thursday, August 19, 2021	18:00	58	78	56	52
Thursday, August 19, 2021	19:00	57	75	56	52
Thursday, August 19, 2021	20:00	57	79	54	51
Thursday, August 19, 2021	21:00	55	81	52	48
Thursday, August 19, 2021	22:00	53	77	52	48
Thursday, August 19, 2021	23:00	52	78	49	46

Statistics	Leq	Lmax	L50	L90
Day Average	57	81	51	47
Night Average	53	68	51	47
Day Low	52	75	46	43
Day High	60	85	57	53
Night Low	48	59	46	41
Night High	58	78	57	54
Ldn	60	Day %		81
CNEL	60	Night %		19



Appendix B3 : Short Term Noise Monitoring Results

Site: ST-1
Project: Osage Warehouse
Location: South-East of Project Site
Coordinates: 38.5221380°, -121.3693467°
Meter: LDL 831-3
Calibrator: CAL200

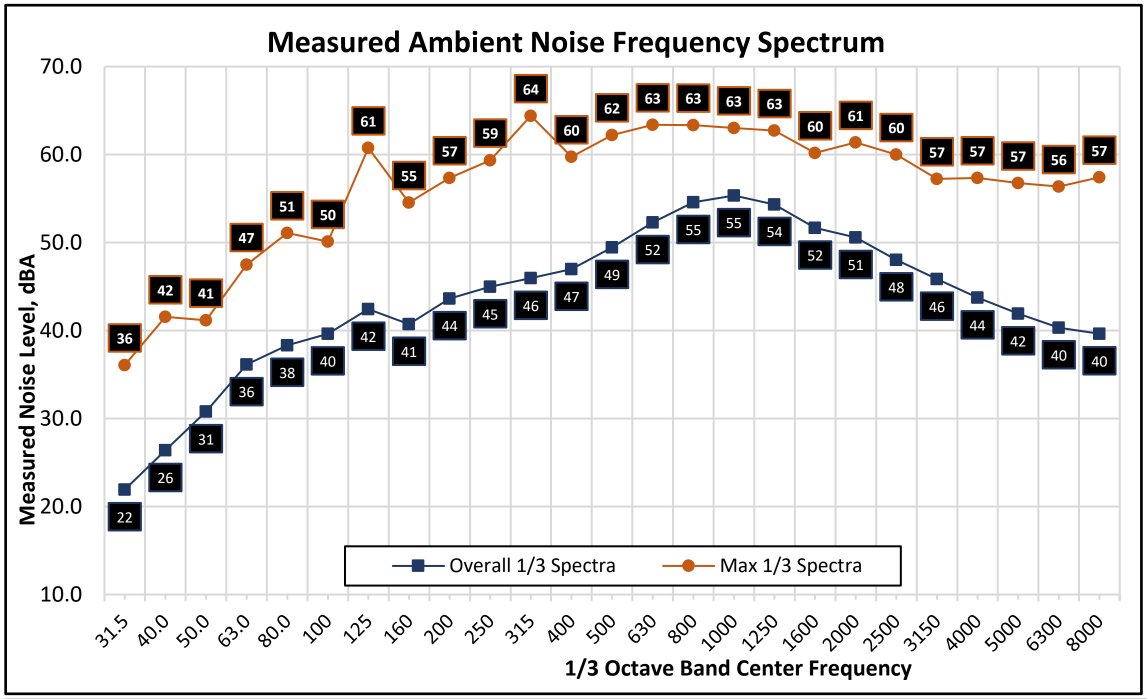
Start: 2021-08-20 09:40:32
Stop: 2021-08-20 09:50:32
SLM: Model 831
Serial: 1329

Measurement Results, dBA

Duration:	0:10
L_{eq}:	62
L_{max}:	72
L_{min}:	48
L_{50}:	61
L_{90}:	54

Notes

Primary noise sources include traffic eminating from South Watt Avenue



Appendix B4 : Short Term Noise Monitoring Results

Site: ST-2
Project: Osage Warehouse
Location: South-East of Project Site
Coordinates: 38.5221249°, -121.3660409°
Meter: LDL 831-3
Calibrator: CAL200

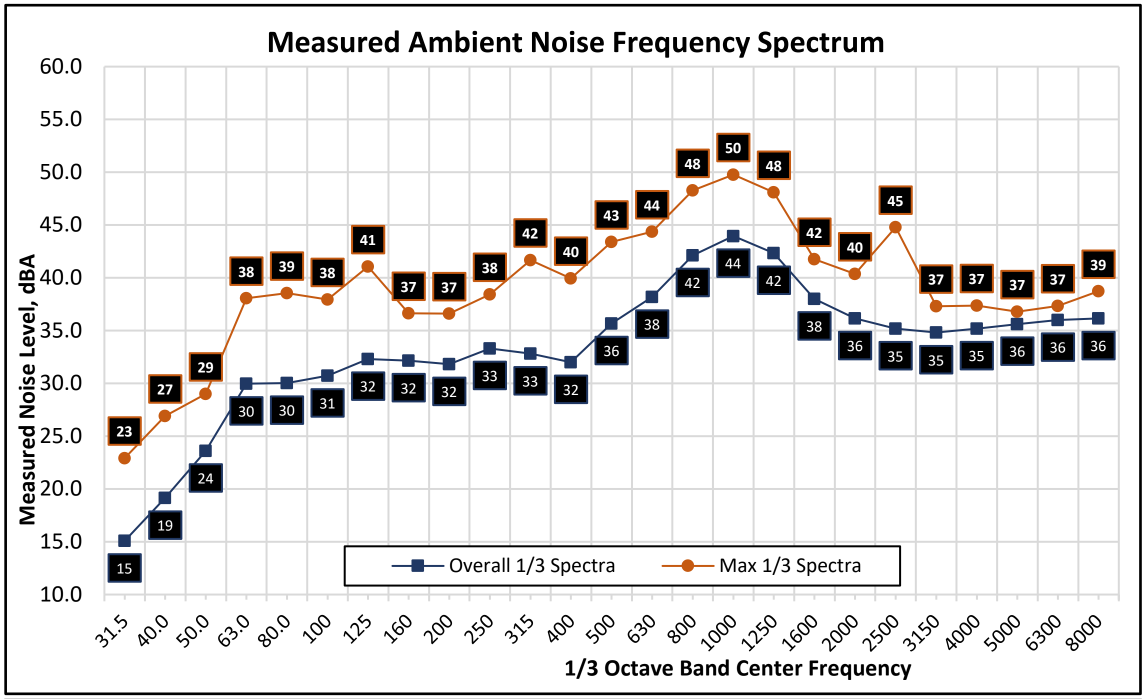
Start: 2021-08-20 10:01:51
Stop: 2021-08-20 10:09:46
SLM: Model 831
Serial: 1329

Measurement Results, dBA

Duration:	0:07
L_{eq}:	50
L_{max}:	54
L_{min}:	45
L_{50}:	49
L_{90}:	47

Notes

Primary noise sources include traffic from South Watt Avenue.



Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210802
Description: Osage Warehouse - Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Osage	East of S Watt Ave	440	81	0	19	1.0%	0.5%	25	120	-5	8	4	2	37.0
2	Osage	West of Project Driveway 1	440	81	0	19	1.0%	0.5%	25	120	-5	8	4	2	37.0
3	Osage	West of Project Driveway 2	440	81	0	19	1.0%	0.5%	25	120	-5	8	4	2	37.0
6	S Watt	1	20,000	81	0	19	2.0%	4.0%	60	160	0	500	232	108	67.4
7	S Watt	2	20,000	81	0	19	2.0%	4.0%	60	340	0	500	232	108	62.5
8	S Watt	3	20,000	81	0	19	2.0%	4.0%	60	500	0	500	232	108	60.0

Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210802

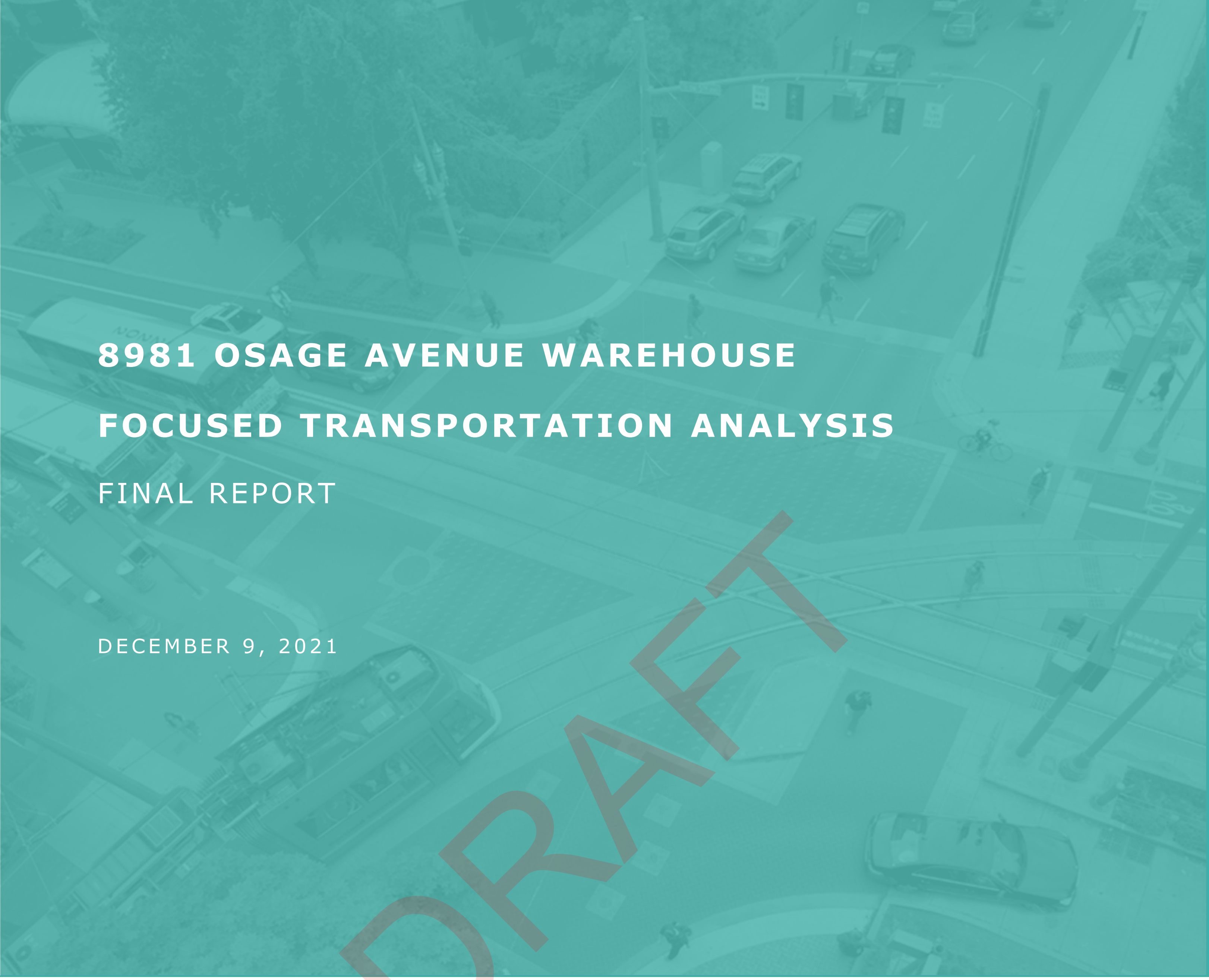
Description: Osage Warehouse - Existing Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Osage	East of S Watt Ave	1,740	81	0	19	1.0%	6.5%	25	120	0	49	23	11	54.2
2	Osage	West of Project Driveway 1	1,740	81	0	19	1.0%	6.5%	25	120	0	49	23	11	54.2
3	Osage	West of Project Driveway 2	960	81	0	19	1.0%	54.2%	25	120	0	123	57	26	60.2
6	S Watt	1	21,300	81	0	19	2.0%	4.0%	60	160	0	521	242	112	67.7
7	S Watt	2	21,300	81	0	19	2.0%	4.0%	60	340	-1	521	242	112	61.8
8	S Watt	3	21,300	81	0	19	2.0%	4.0%	60	500	-5	521	242	112	55.3

APPENDIX C
FOCUSED TRANSPORTATION ANALYSIS



8981 OSAGE AVENUE WAREHOUSE

FOCUSED TRANSPORTATION ANALYSIS

FINAL REPORT

DECEMBER 9, 2021

PREPARED FOR:

CITY OF SACRAMENTO

DKS

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INTRODUCTION

This transportation analysis addresses transportation and circulation conditions associated with a proposed development project at 8981 Osage Avenue in the City of Sacramento. The analysis focuses on the project's relationship to the City and County street system, including an adjacent intersection, the proposed access points, and on-site circulation. The analysis includes consideration of motorized vehicle traffic impacts on roadway capacity, construction impacts, and potential impacts to transit service, bicyclists, and pedestrians. Quantitative transportation analyses have been conducted for the following scenarios:

- Existing Conditions (2021)
- Existing Plus Project Conditions

PROJECT DESCRIPTION

As illustrated in **Figure 1**, the 9.51-acre project site is located at 8981 Osage Avenue, in the northeast quadrant of the intersection of Osage Avenue and South Watt Avenue. The site is currently vacant. As shown in the figure, the site is located on the City boundary. The project site is located within a heavy industrial M-2(S)-R zone.

Figure 2 illustrates the project site plan. The project proposes a warehouse of 136,720 square feet. Two vehicular access points are proposed along Osage Avenue, with no direct access to South Watt Avenue. Nearby parcels west of South Watt Avenue serve commercial and industrial uses. Opposite the site along the south side of Osage Avenue are three residences. East of the site, a mix of residential, agricultural, and commercial uses are located along both sides of Osage Avenue.

FIGURE 1. SITE LOCATION

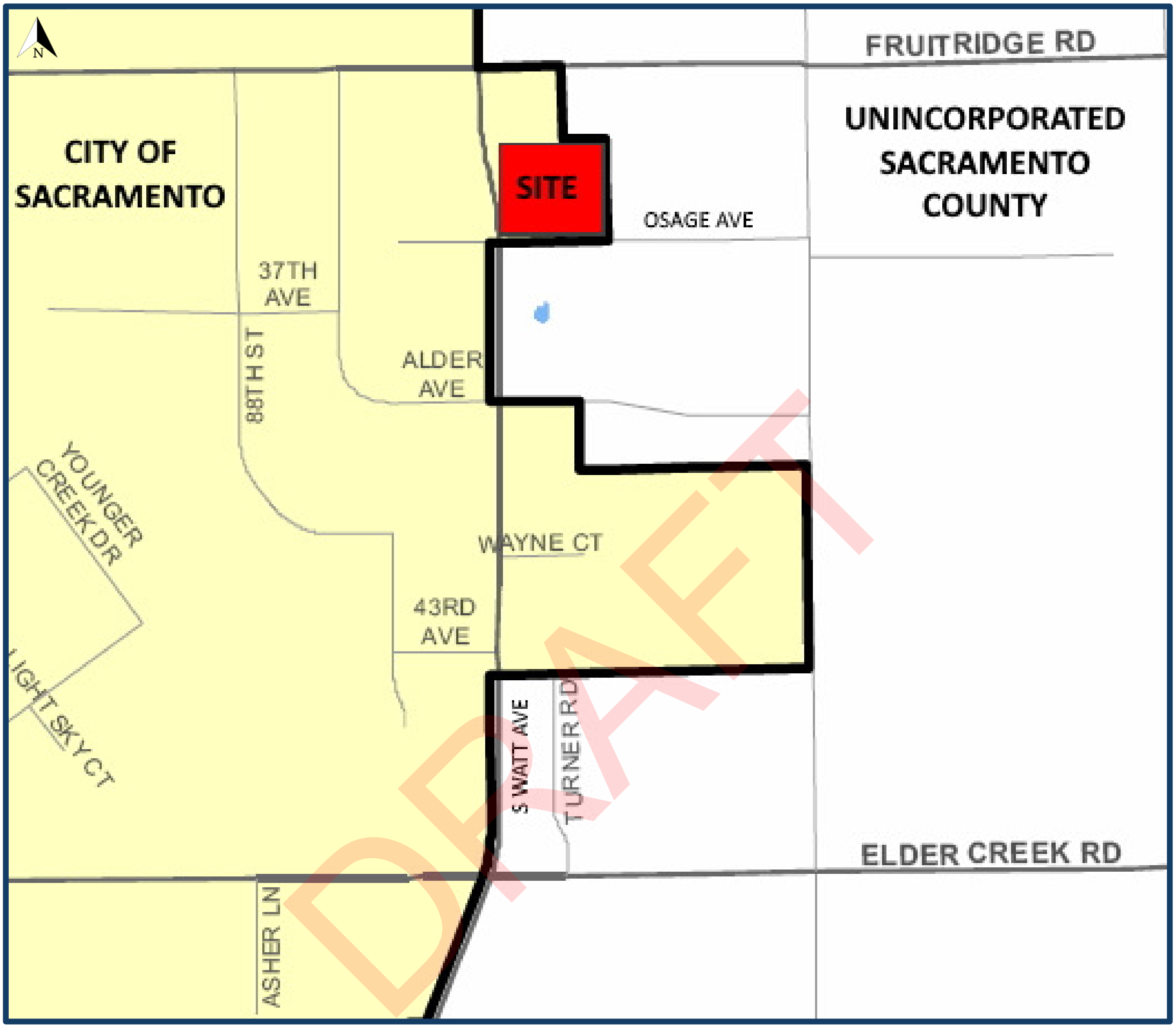
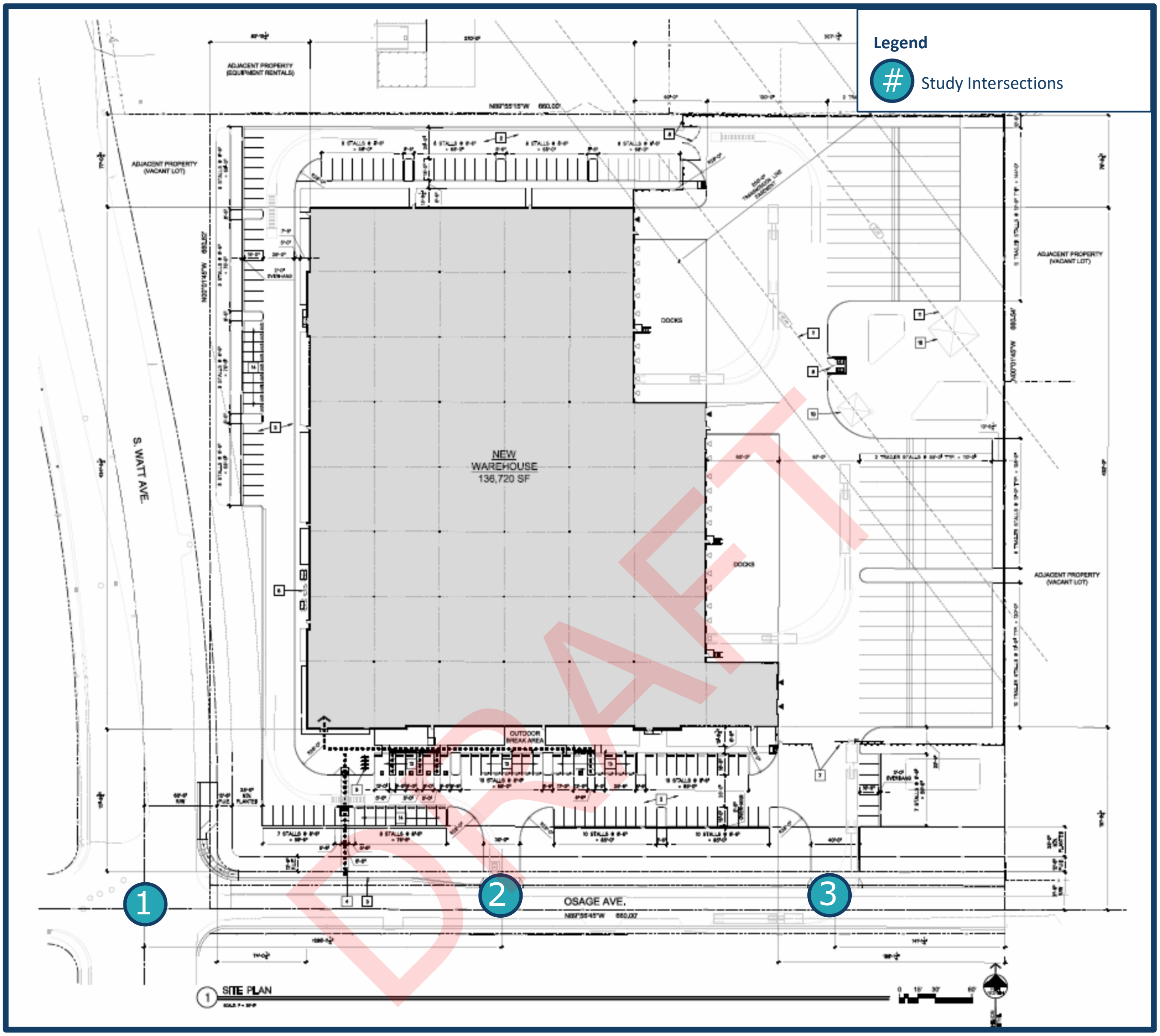


FIGURE 2. SITE PLAN



Source: Panattoni, New Warehouse, Sheet 1.01, July 22, 2021.

ENVIRONMENTAL SETTING

The roadway, transit, bicycle, and pedestrian transportation systems within the study area are described below.

ROADWAY SYSTEM

The roadway system near the proposed project is described below.

South Watt Avenue is a north-south arterial that extends to Folsom Boulevard to the north, where it becomes Watt Avenue. Watt Avenue provides access to US 50 and extends northerly across the American River. To the north, it provides access through northern Sacramento County to I-80 and into Placer County. To the south, South Watt Avenue extends to Florin Road, where it becomes Elk Grove Florin Road. Elk Grove Florin Road extends to Stockton Boulevard in the City of Elk Grove. South Watt Avenue has two to six through lanes. It is a two-lane roadway at its unsignalized intersection with Osage Avenue.

Osage Avenue is an east-west local street. It begins about 600 feet west of South Watt Avenue at a gated entry to an industrial / commercial complex. To the east, it extends about 2,000 feet east of South Watt Avenue to a T-intersection at Hedge Avenue. Osage Avenue is stop-sign controlled at South Watt Avenue and at Hedge Avenue.

West of South Watt Avenue, Osage Avenue has been improved with 40 feet of pavement and sidewalks on both sides. East of South Watt Avenue, Osage Avenue is typically 16 to 20 feet wide, without shoulders or sidewalks. The pavement east of Osage Avenue is in poor to fair condition, exhibiting alligator cracking in several areas.

Fruitridge Road is an east-west arterial located about 1,100 feet north of the Osage Avenue. To the west, the roadway provides access to SR 99 and extends to South Land Park Drive. To the east, Fruitridge Road extends to Mayhew Road. Fruitridge Road has two to four through lanes.

Elder Creek Road is an east-west arterial located about 4,100 feet south of Osage Avenue. To the west, Elder Creek Road extends to Stockton Boulevard, where it becomes 47th Avenue. 47th Avenue provides access to SR 99. To the east, Elder Creek Road extends to Excelsior Road. Elder Creek Road has two to four through lanes.

EXISTING PEDESTRIAN SYSTEM

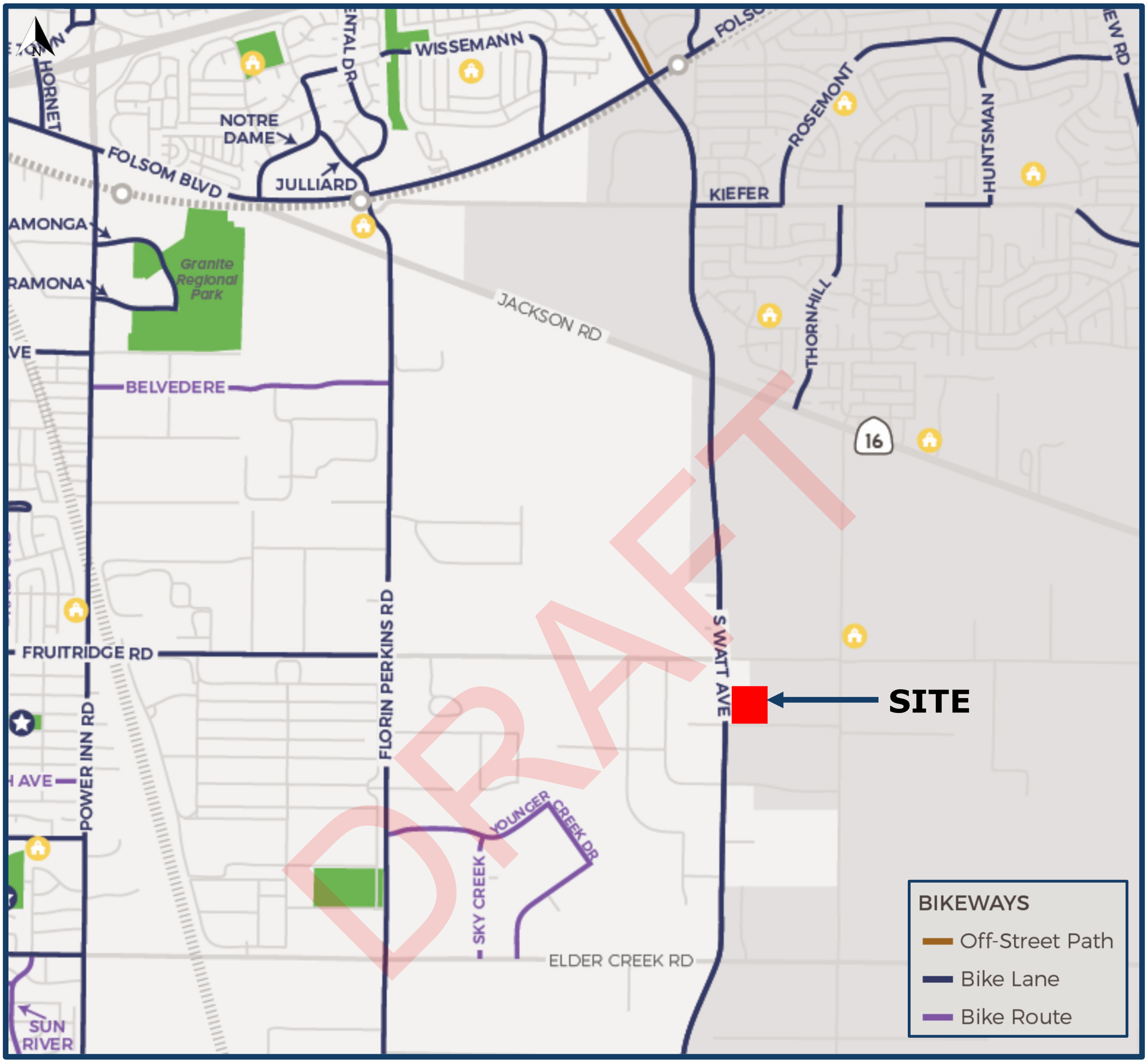
The existing pedestrian system is limited in the site vicinity.

- Osage Avenue west of South Watt Avenue – sidewalks on both sides.
- Osage Avenue east of South Watt Avenue – no sidewalks or shoulders.
- South Watt Avenue – Sidewalk on the west side of the street only from approximately 370 feet south of Osage Avenue to approximately 1,300 feet north of Fruitridge Road. A variable width shoulder is provided on both sides of South Watt Avenue in the project vicinity.

EXISTING BICYCLE SYSTEM

Figure 3 illustrates the existing bicycle system in the site vicinity. Bike lanes currently exist on both sides of South Watt Avenue. They extend to the north providing access to light rail at Folsom Boulevard. They extend to the south to Gerber Road.

FIGURE 3. BIKEWAYS



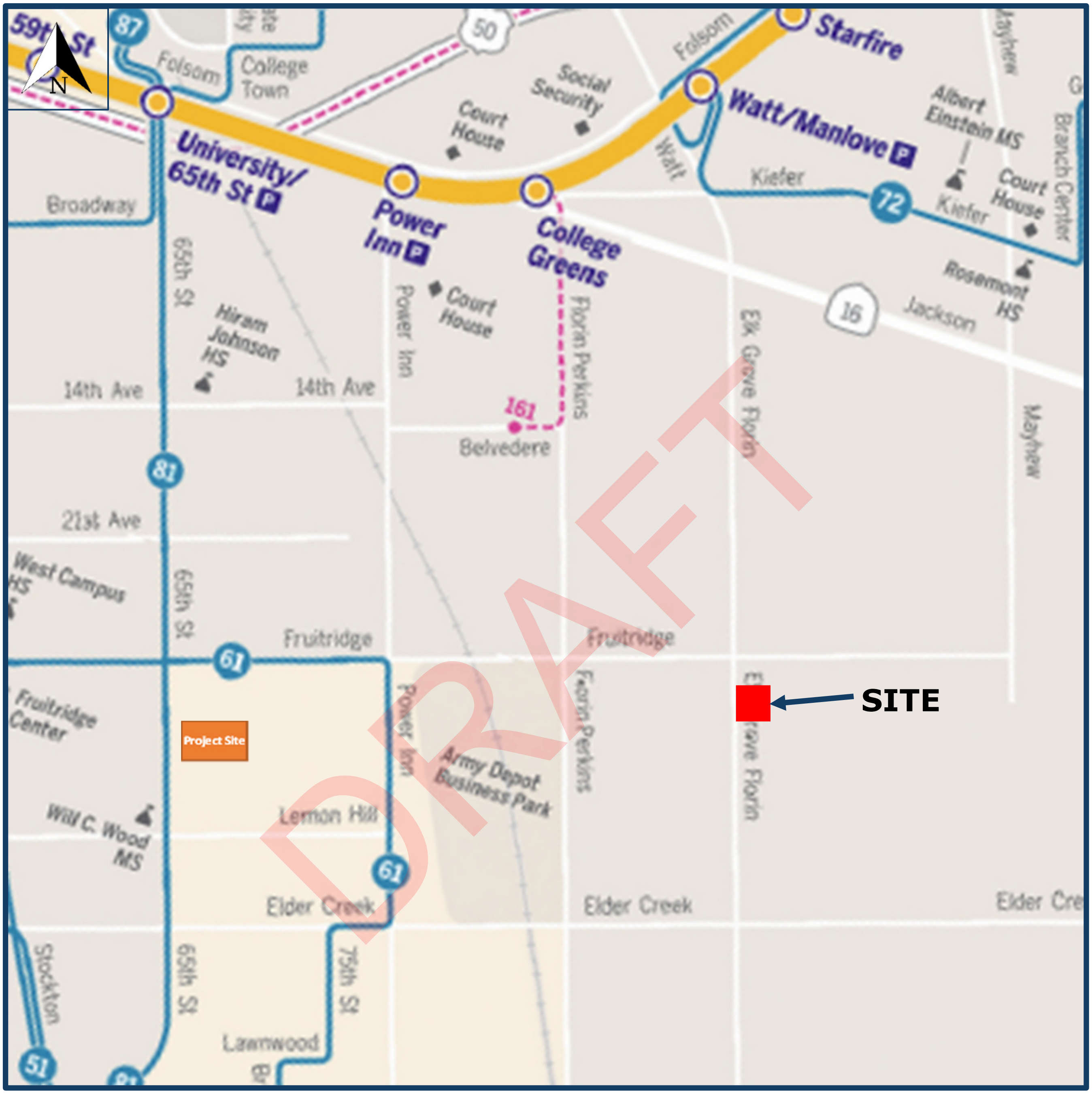
Source: City of Sacramento Bikeway User Map, Bicycle Master Plan amended on Aug 14, 2018.

TRANSIT SYSTEM

Regional Transit (RT) service in the site vicinity is illustrated in **Figure 4**.

There is no transit service in the vicinity of the project site. RT's Gold Line Light Rail service is located about 2.2 miles north of the site. Bus Route 61 (Fruitridge) operates along Fruitridge Road and Florin Perkins Road about 1.4 miles northwest of the project site.

FIGURE 4. REGIONAL TRANSIT ROUTES



Source: Sacramento Regional Transit Bus & Light Rail System Map

STUDY AREA

The following intersections are included in the study area and shown in **Figure 2**:

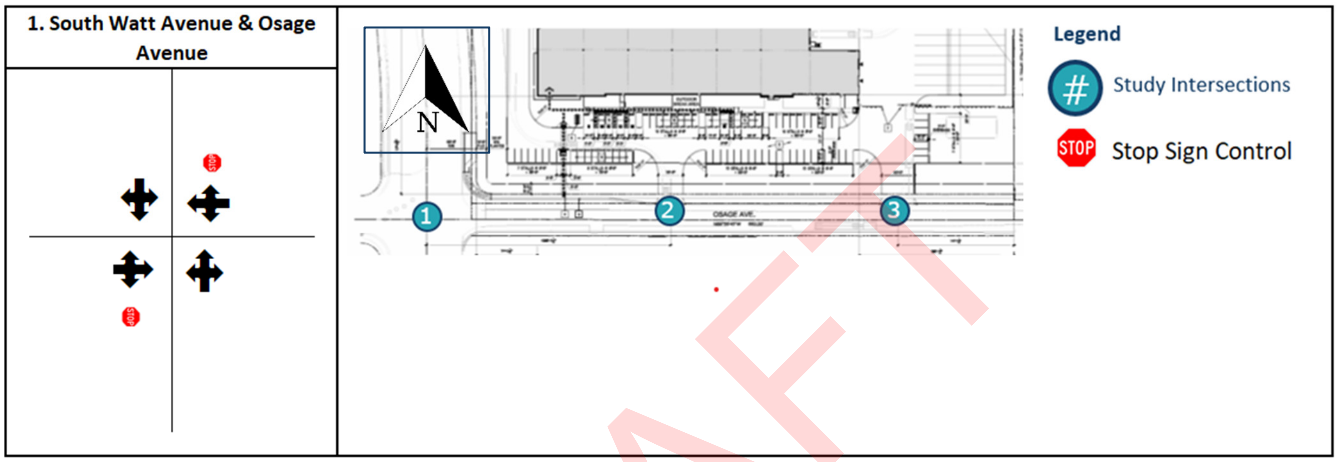
1. Osage Avenue and South Watt Avenue
2. Osage Avenue and West Driveway

3. Osage Avenue and East Driveway

EXISTING INTERSECTION LANE CONFIGURATION

Existing intersection geometry (number of approach lanes and traffic control) is illustrated in **Figure 5**. The intersection of South Watt Avenue and Osage Avenue is controlled by stop signs on the Osage Avenue approaches.

FIGURE 5. EXISTING INTERSECTION LANE CONFIGURATION



TRAFFIC DATA COLLECTION

VOLUME DATA

Intersection turning movement counts were collected at the intersection of South Watt Avenue and Osage Avenue in 15-minute intervals on Wednesday, October 13, 2021, from 6:00 AM to 10:00 PM. These counts included data on pedestrians and bicyclists, as well as heavy vehicles. Detailed traffic count data is included in the Appendix.

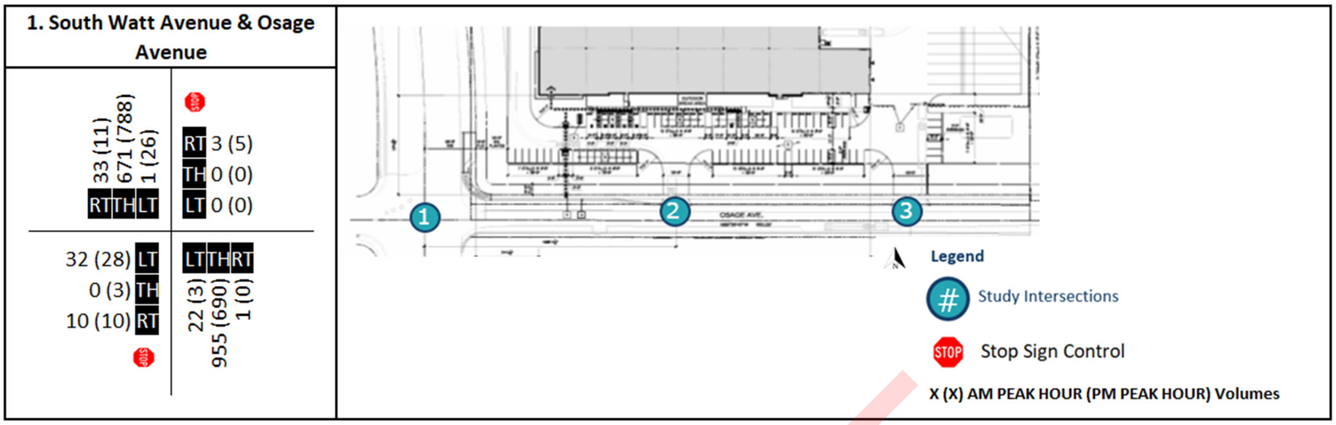
Due to the economic and travel disruptions of the COVID-19 pandemic, there was concern that these volumes might be lower than pre-pandemic levels. The 2021 counts were compared to peak period intersection counts collected at the intersection of South Watt Avenue and Fruitridge Road on Tuesday, October 2, 2018. Counts were compared for the 7:00 to 9:00 AM and 4:00 to 6:00 PM time periods. Compared to 2018, the 2021 counts were lower, as follows:

- Northbound AM – 12 percent lower
- Southbound AM – 14 percent lower
- Northbound PM – 1 percent lower
- Southbound PM – 11 percent lower

Based upon these results, the 2021 counts were adjusted (increased) to reflect 2018 traffic volume levels. Detailed calculations are included in the appendix.

Figure 6 illustrates the adjusted existing 2021 peak hour traffic volumes used in the analysis.

FIGURE 6. ADJUSTED EXISTING 2021 PEAK HOUR VOLUMES



SPEED DATA

On Wednesday, October 13, 2021, for 24 hours, travel speed and volume data was collected on South Watt Avenue just south of Osage Avenue. Detailed speed data is included in the appendix.

In the northbound direction, the average (mean) speed is 46 miles per hour. The 15th percentile speed is 39 miles per hour. The median (50th percentile) speed is 48 miles per hour. The 85th percentile speed is 55 miles per hour. The 95th percentile speed is 59 miles per hour. The 10-mile per hour pace is 46 miles per hour to 55 miles per hour, with 52 percent of the vehicles travelling within that speed range.

In the southbound direction, the average (mean) speed is 46 miles per hour. The 15th percentile speed is 35 miles per hour. The median (50th percentile) speed is 48 miles per hour. The 85th percentile speed is 58 miles per hour. The 95th percentile speed is 64 miles per hour. The 10-mile per hour pace is 46 miles per hour to 55 miles per hour, with 35 percent of the vehicles travelling within that speed range.

REGULATORY SETTING

CITY OF SACRAMENTO

The Mobility Element of the Sacramento 2035 General Plan outlines goals and policies that coordinate the transportation and circulation system with planned land uses. The following level of service policy has been used in this study, as amended on January 23, 2018:

> **Policy M 1.2.2 Level of Service (LOS) Standard.** The City shall implement a flexible context sensitive Level of Service (LOS) standard, and will measure traffic operations against the vehicle LOS thresholds established in this policy. The City will measure Vehicle LOS based on the methodology contained in the latest version of the Highway Capacity Manual (HCM) published by the Transportation Research Board. The City's specific vehicle LOS thresholds

have been defined based on community values with respect to modal priorities, land use context, economic development, and environmental resources and constraints. As such, the City has established variable LOS thresholds appropriate for the unique characteristics of the City's diverse neighborhoods and communities. The City will strive to operate the roadway network at LOS D or better for vehicles during typical weekday conditions, including AM and PM peak hour with the following exceptions described below and mapped on Figure M-1 (**Figure 7**):

A. Core Area (Central City Community Plan Area) - LOS F allowed

B. Priority Investment Areas – LOS F allowed

C. LOS E Roadways - LOS E is allowed for the following roadways because expansion of the roadways would cause undesirable impacts or conflict with other community values.

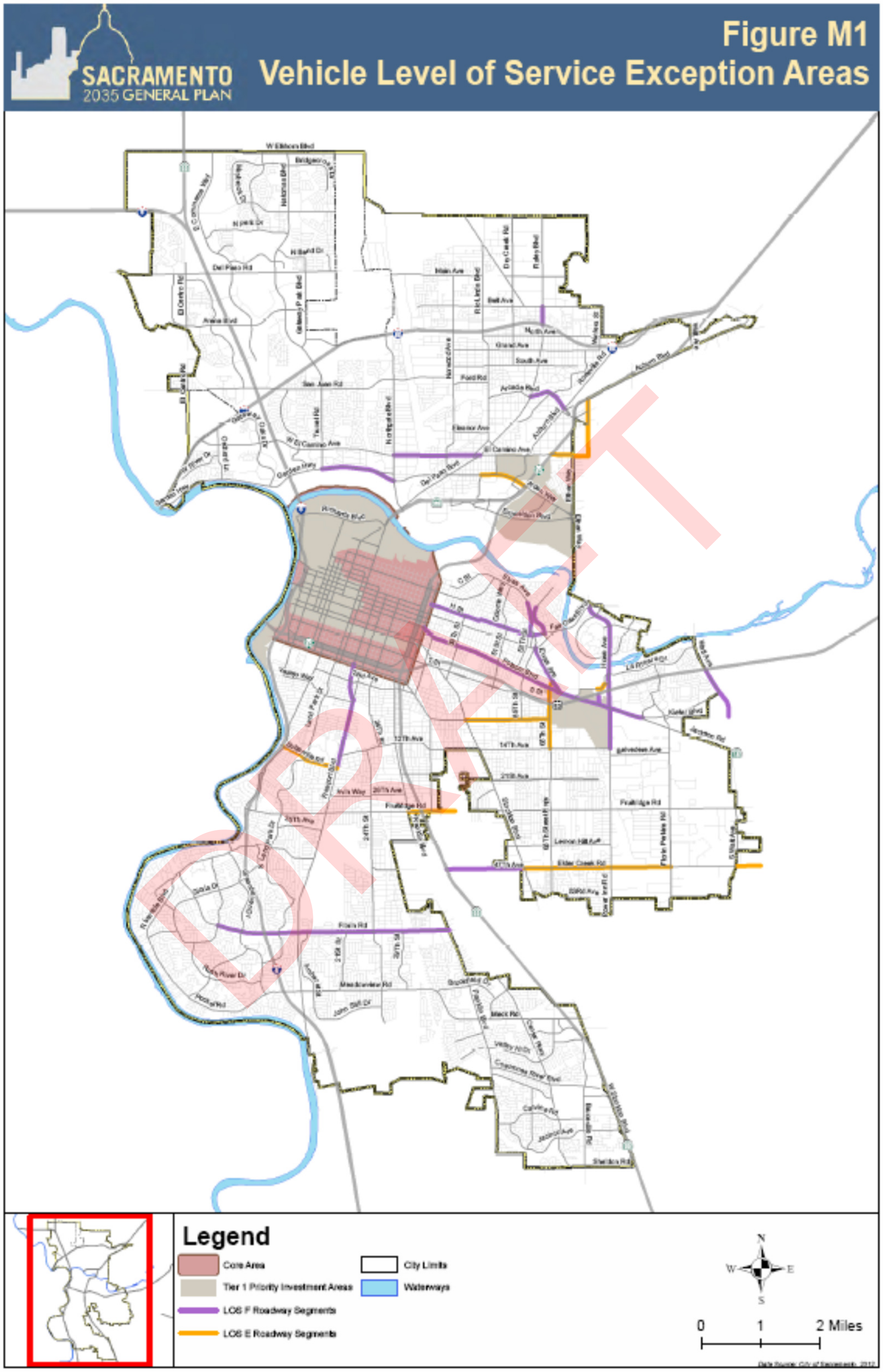
- 65th Street: Elvas Avenue to 14th Avenue
- Arden Way: Royal Oaks Drive to I-80 Business
- Broadway: Stockton Boulevard to 65th Street
- College Town Drive: Hornet Drive to La Rivera Drive
- El Camino Avenue: I-80 Business to Howe Avenue
- Elder Creek Road: Stockton Boulevard to Florin Perkins Road
- Elder Creek Road: South Watt Avenue to Hedge Avenue
- Fruitridge Road: Franklin Boulevard to SR 99
- Fruitridge Road: SR 99 to 44th Street
- Howe Avenue: El Camino Avenue to Auburn Boulevard
- Sutterville Road: Riverside Boulevard to Freeport Boulevard

LOS E is also allowed on all roadway segments and associated intersections located within ½ mile walking distance of light rail stations.

D. Other LOS F Roadways - LOS F is allowed for the following roadways because expansion of the roadways would cause undesirable impacts or conflict with other community values.

- 47th Avenue: State Route 99 to Stockton Boulevard
- Arcade Boulevard: Marysville Boulevard to Roseville Road
- Carlson Drive: Moddison Avenue to H Street
- Duckhorn Drive: Arena Boulevard to San Juan Road
- El Camino Avenue: Grove Avenue to Del Paso Boulevard
- Elvas Avenue: J Street to Folsom Boulevard

FIGURE 7. VEHICLE LEVEL OF SERVICE EXCEPTION AREAS



Source: Sacramento 2035 General Plan, Mobility Element, Amended January 23, 2018.

- Elvas Avenue/56th Street: 52nd Street to H Street
- Florin Road: Havenside Drive to Interstate 5
- Florin Road: Freeport Boulevard to Franklin Boulevard
- Florin Road: Interstate 5 to Freeport Boulevard
- Folsom Boulevard: 47th Street to 65th Street
- Folsom Boulevard: Howe Avenue to Jackson Highway
- Folsom Boulevard: US 50 to Howe Avenue
- Freeport Boulevard: Sutterville Road (North) to Sutterville Road (South)
- Freeport Boulevard: 21st Street to Sutterville Road (North)
- Freeport Boulevard: Broadway to 21st Street
- Garden Highway: Truxel Road to Northgate Boulevard
- H Street: Alhambra Boulevard to 45th Street
- H Street 45th: Street to Carlson Drive
- Hornet Drive: US 50 Westbound On-ramp to Folsom Boulevard
- Howe Avenue: US 50 to Fair Oaks Boulevard
- Howe Avenue: US 50 to 14th Avenue
- Raley Boulevard: Bell Avenue to Interstate 80
- San Juan Road: Duckhorn Drive to Truxel Road
- South Watt Avenue: US 50 to Kiefer Boulevard
- West El Camino Avenue: Northgate Boulevard to Grove Avenue

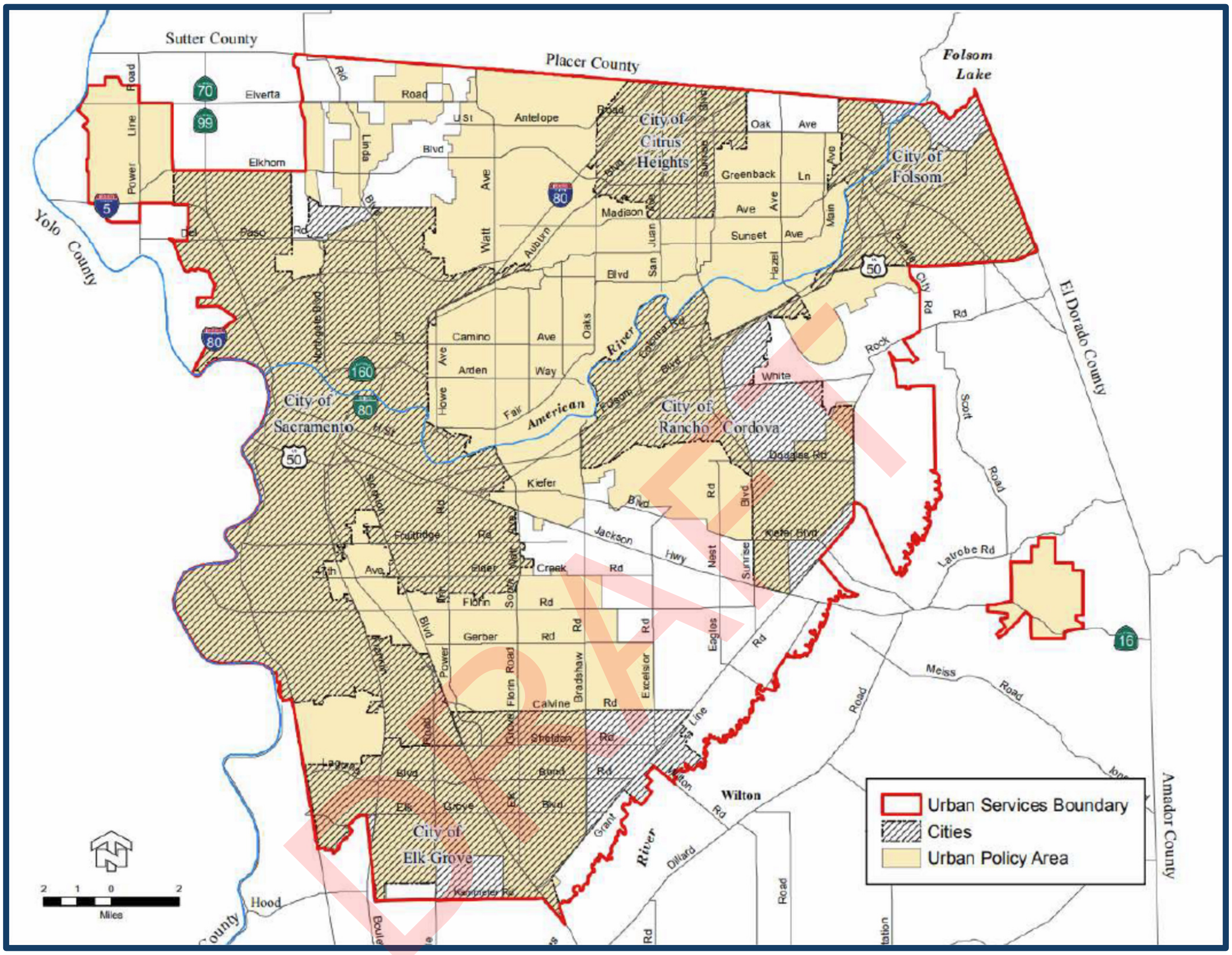
E. If maintaining the above LOS standards would, in the City's judgment be infeasible and/or conflict with the achievement of other goals, LOS E or F conditions may be accepted provided that provisions are made to improve the overall system, promote non-vehicular transportation, and/or implement vehicle trip reduction measures as part of a development project or a city-initiated project. Additionally, the City shall not expand the physical capacity of the planned roadway network to accommodate a project beyond that identified in Figure M4 and M4a (2035 General Plan Roadway Classification and Lanes).

In accordance with the City policies, the applicable operating standard for the study area intersections is LOS D.

SACRAMENTO COUNTY

Sacramento County defines the minimum acceptable operation level for its roadways to be LOS D for rural areas and LOS E for urban areas. The urban areas are those areas that are dominated with urban type land uses and transportation infrastructure and are located within the Urban Service Boundary (USB), as shown in the Land Use Element of the Sacramento County General Plan and Figure F-1 (**Figure 8**). The rural areas are those areas that are either outside the USB or are dominated with rural type land uses and transportation infrastructure and are located within the USB. The study area intersections are located on the boundary between the City of Sacramento and a rural area within the Urban Services Boundary.

FIGURE 8. SACRAMENTO COUNTY URBAN SERVICES BOUNDARY MAP



Source: Transportation Analysis Guidelines, Sacramento County, September 10, 2020.

Given the nature of the project and the adjacent urban development across South Watt Avenue, it is presumed that the County standard is LOS E. However, as this is less conservative than the City standard, LOS D shall be considered to be the standard in this analysis.

LEVEL OF SERVICE ANALYSIS AND METHODOLOGY

Intersection analyses were conducted using a methodology outlined in the Transportation Research Board's Special Report 209, Highway Capacity Manual 6th Edition (HCM 6). The methodology utilized is known as "operational analysis." This procedure calculates an average control delay per vehicle at an intersection and assigns a level of service designation based upon the delay. **Table 1** presents the level of service criteria for intersections in accordance with the HCM 6 methodology.

In accordance with City of Sacramento policy, at unsignalized intersection, the intersection average delay / LOS is used to determine conformity with City policies. Sacramento County policy considers LOS for individual movements / approaches.

TABLE 1. INTERSECTION LEVEL OF SERVICE

INTERSECTION LEVEL OF SERVICE CRITERIA		
LEVEL OF SERVICE (LOS)	TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: Highway Capacity Manual 6th Edition, Transportation Research Board.

Queue lengths at intersections and driveways have been estimated based upon the 95th percentile queue. HCM 6 computes the queue length for unsignalized intersections and roundabouts.

RESULTS OF EXISTING CONDITION ANALYSIS

Existing condition intersection analysis results are summarized in **Table 2.** For analysis purposes, the recorded heavy vehicle percentages were utilized for each movement, rather than a default value. The appendix includes the analysis details.

TABLE 2. EXISTING INTERSECTION OPERATION ANALYSIS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. Osage Avenue & South Watt Avenue	2.8	A	1.7	A
- Northbound left turn	*9.6*	*A*	*9.3*	*A*
- Southbound left turn	*10.0*	*A*	*9.1*	*A*
- Eastbound	*109.3*	*F*	*56.7*	*F*
- Westbound	*18.3*	*C*	*13.1*	*B*

Source: DKS Associates, 2021.

The existing study area intersection operates at LOS A overall. The eastbound movement operates at LOS F in both peak hours, primarily due to the difficulty of making a left turn into the South Watt Avenue traffic stream. The westbound movement operates at LOS C in the AM peak hour and LOS B in the PM peak hour. However, it should be noted that only westbound right turns were recorded during the peak hours. Motorists may be choosing alternate routes to avoid the difficulty of making a left turn at this unsignalized intersection from westbound Osage Avenue.

PROJECT TRAVEL CHARACTERISTICS

TRIP GENERATION

Vehicular trip generation estimates of the project are based upon information published by the Institute of Transportation Engineers (ITE). Specifically, the following source has been utilized:

- Trip Generation, 11th Edition.

For conservatism in the analysis, no adjustments have been made for mode choice, as the mode choice in the site environs is predominantly via private automobile. Various manufacturing, industrial, and warehouse uses are permitted in the M-2(S)-R zone. Such uses could be accommodated within the proposed project. Several representative permitted land uses are included in the ITE data:

- Code 110 – General Light Industrial
- Code 130 – Industrial Park
- Code 140 – Manufacturing
- Code 150 – Warehousing
- Code 154 – High-Cube Transload and Short-Term Storage Warehouse
- Code 155 – High-Cube Fulfillment Center Warehouse – Non-Sort
- Code 156 – High-Cube Parcel Hub Warehouse

VEHICULAR TRIP GENERATION ESTIMATES

Table 3 summarizes trip generation for these land use types. Additional descriptive information on each land use type is included in the appendix.

TRUCK TRIP GENERATION ESTIMATES

ITE Trip Generation, 11th Edition, also provides information on the number of truck trips generated by each of the land use categories. **Table 4** summarizes the truck trip generation.

RECOMMENDED TRIP GENERATION ESTIMATES

As the transportation analysis will focus on peak weekday commuter period intersection operations, the manufacturing trip generation estimates (Code 140) have been selected for analysis, as they provide the most conservative (highest) peak hour estimates of total vehicle trips. **Table 5** summarizes the recommended trip generation estimates.

HOURLY TRIP GENERATION ESTIMATES

For the determination of vehicle volumes for traffic signal warrants, trip generation was estimated for the manufacturing land use for all 24 hours of a typical weekday based on ITE Trip Generation, 11th Edition, information. The ITE information provides a percentage of land use trips entering and exiting a site for each hour of the day. As the hourly information is from a different data sample and is independent of project size, the hourly percentages were proportionally adjusted to match the AM and PM peak hour volume estimates. The derivation of the hourly adjustments is documented in the Appendix. Traffic counts collected on Wednesday, October 13, 2021, at the intersection of Osage Avenue and South Watt Avenue found that the AM peak hour occurs from 7:15 to 8:15 AM, while the PM peak hour occurs from 4:30 to 5:30 PM. **Table 6** summarizes the hourly trip generation.

TABLE 3. VEHICULAR TRIP GENERATION ESTIMATES

USE	ITE CODE	SIZE (1,000 SQUARE FEET)	VEHICLE TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
GENERAL LIGHT INDUSTRIAL	110	136.72	565	85	12	97	7	43	50
INDUSTRIAL PARK	130		1,105	37	9	46	10	36	46
MANUFACTURING	140		717	71	22	93	31	70	101
WAREHOUSING	150		254	31	9	40	12	31	43
HIGH-CUBE TRANSLOAD AND SHORT-TERM STORAGE WAREHOUSE	154		191	8	3	11	4	10	14
HIGH-CUBE FULFILLMENT CENTER WAREHOUSE - NON-SORT	155		100	17	4	21	9	13	22
HIGH-CUBE PARCEL HUB WAREHOUSE	156		633	48	48	96	60	28	88

Note: Peak Hour refers to peak hour of adjacent street traffic.

Source: ITE Trip Generation, 11th Edition, 2021.

TABLE 4. TRUCK TRIP GENERATION ESTIMATES

USE	ITE CODE	SIZE (1,000 SQUARE FEET)	TRUCK TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
GENERAL LIGHT INDUSTRIAL	110	136.72	34	1	0	1	1	0	1
INDUSTRIAL PARK	130		78	2	3	5	2	3	5
MANUFACTURING	140		62	2	2	4	2	2	4
WAREHOUSING	150		81	2	1	3	2	2	4
HIGH-CUBE TRANSLOAD AND SHORT-TERM STORAGE WAREHOUSE	154		30	1	2	3	0	1	1
HIGH-CUBE FULFILLMENT CENTER WAREHOUSE - NON-SORT	155		31	2	1	3	0	1	1
HIGH-CUBE PARCEL HUB WAREHOUSE	156		79	6	6	12	4	4	8

Note: Peak Hour refers to peak hour of adjacent street traffic.

Source: ITE Trip Generation, 11th Edition, 2021.

TABLE 5. RECOMMENDED VEHICULAR TRIP GENERATION ESTIMATES

USE	VEHICLE TYPE	SIZE (1,000 SQUARE FEET)	VEHICLE TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
MANUFACTURING	TRUCKS	136.72	62	2	2	4	2	2	4
	TOTAL		717	71	22	93	31	70	101

Source: ITE Trip Generation, 11th Edition, 2021.

TABLE 6. HOURLY TRIP GENERATION ESTIMATES

TIME	TRIPS GENERATED (TRIP-ENDS)					
	ALL VEHICLE TRIPS			TRUCK TRIPS		
	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
12:00 - 1:00 AM	1	6	7	0	0	0
1:00 - 2:00 AM	1	4	5	0	0	0
2:00 - 3:00 AM	1	3	4	0	0	0
3:00 - 4:00 AM	1	2	3	0	1	1
4:00 - 5:00 AM	4	1	5	0	0	0
5:00 - 6:00 AM	9	0	9	0	0	0
6:00 - 7:00 AM	52	8	60	1	1	2
7:00 - 8:00 AM	72	20	92	2	2	4
8:00 - 9:00 AM	23	11	34	3	3	6
9:00 - 10:00 AM	12	9	21	3	3	6
10:00 - 11:00 AM	10	9	19	4	3	7
11:00 - 12:00 PM	19	15	34	3	3	6
12:00 - 1:00 PM	27	19	46	2	3	5
1:00 - 2:00 PM	20	21	41	3	2	5
2:00 - 3:00 PM	16	22	38	2	2	4
3:00 - 4:00 PM	28	64	92	3	3	6
4:00 - 5:00 PM	23	56	79	2	2	4
5:00 - 6:00 PM	17	47	64	1	1	2
6:00 - 7:00 PM	4	8	12	1	1	2
7:00 - 8:00 PM	3	5	8	1	0	1
8:00 - 9:00 PM	3	5	8	0	1	1
9:00 - 10:00 PM	4	7	11	0	0	0
10:00 - 11:00 PM	5	7	12	0	0	0
11:00 - 12:00 AM	4	9	13	0	0	0
TOTAL	359	358	717	31	31	62
AM PEAK HOUR (7:15 TO 8:15 AM)	71	22	93	2	2	4
PM PEAK HOUR (4:30 TO 5:30 PM)	31	70	101	2	2	4

Note: Peak Hour refers to peak hour of adjacent street traffic.

Source: ITE Trip Generation, 11th Edition, 2021.

TRIP DISTRIBUTION

Vehicular trip distribution estimates of the project are based upon:

- Traffic counts collected at the intersection of Osage Avenue and South Watt Avenue on Wednesday, October 13, 2021, from 6:00 AM to 10:00 PM
- The functional and physical characteristics of area roadways
- Travel patterns of nearby industrial land uses

The traffic counts collected at the adjacent intersection segregated motorized vehicles by type: light, articulated trucks, and medium. For trip distribution purposes, light vehicles (typically automobiles and single-unit, 4-wheel trucks) were separated from “heavy” vehicles (articulated trucks and medium vehicles).

The west leg of the intersection of Osage Avenue and South Watt Avenue is a dead-end street, providing access to industrial and commercial uses. Intersection turning movements into and out of this leg of Osage Avenue provided information on distribution patterns, including heavy truck movements.

Regarding trips on Osage Avenue east of South Watt Avenue, the current travel patterns show that fewer than three percent of trips associated with the uses west of South Watt Avenue use this roadway. For trip distribution purposes of the proposed warehouse at 8981 Osage Avenue, it was assumed that 5 percent of light vehicle trips would use Osage Avenue east of the warehouse. It was also assumed that heavy vehicle traffic to and from the warehouse would be unlikely to use Osage Avenue east of the warehouse due to the current condition of the roadway. Osage Avenue east of South Watt Avenue is typically less than 20 feet wide, and the pavement is in poor condition.

Figure 9 illustrates the resultant trip distribution by time of day for light and heavy vehicles.

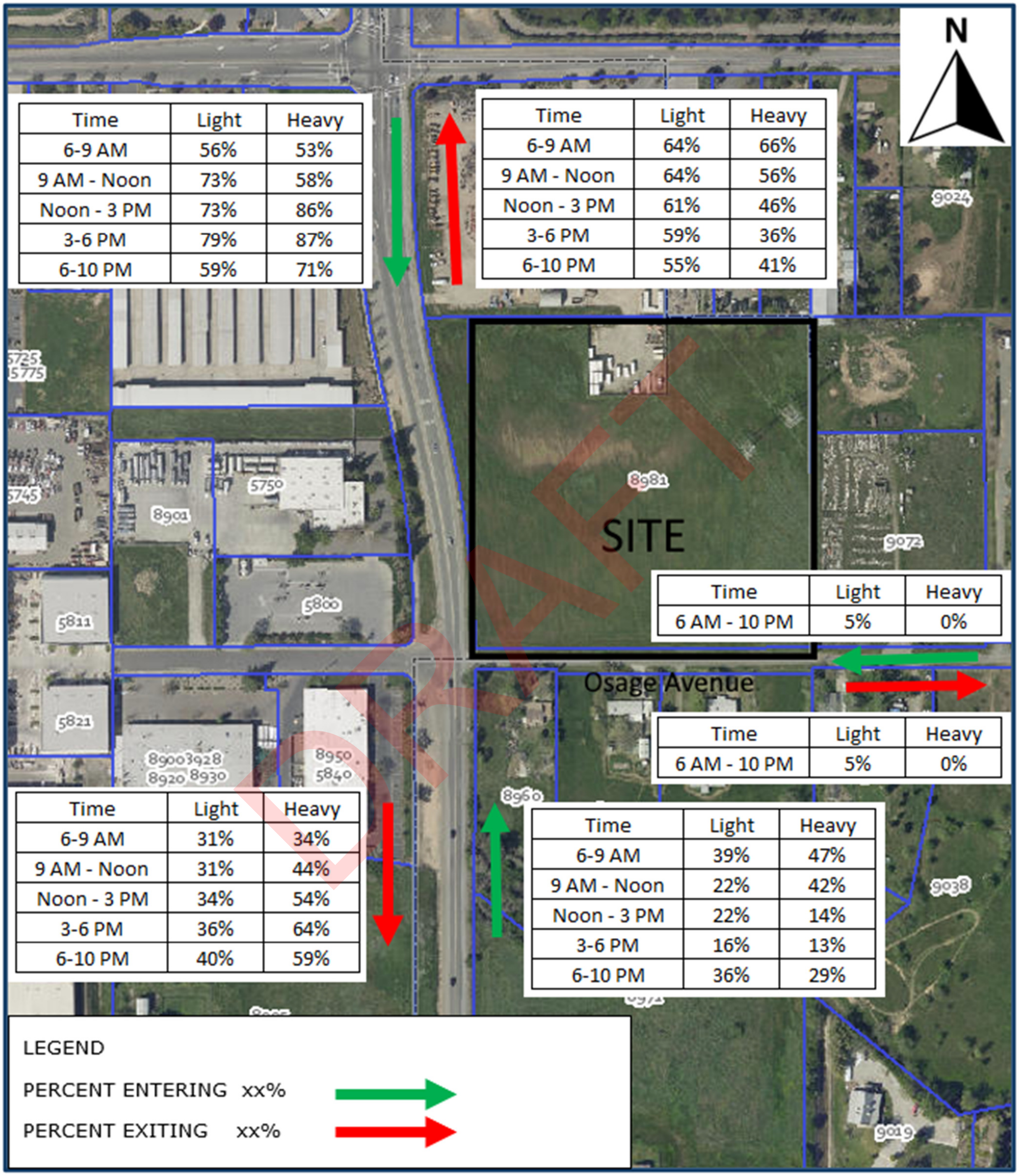
THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, thresholds of significance adopted by the governing jurisdictions in applicable general plans and previous environmental documents, and professional judgement, a significant impact would occur if the proposed project would:

INTERSECTIONS – CITY OF SACRAMENTO

- The traffic generated by the project degrades LOS from an acceptable LOS (without the project) to an unacceptable LOS (with the project),
- The LOS (without project) is unacceptable and project generated traffic increases the average vehicle delay by 5 seconds or more.
- Note: General Plan Mobility Element Policy M 1.2.2 sets forth definitions for what is considered an acceptable LOS. As previously discussed, Policy M 1.2.2 applies to the study area roadway facilities as follows:

FIGURE 9. ESTIMATED TRIP DISTRIBUTION



Time	Light	Heavy
6-9 AM	56%	53%
9 AM - Noon	73%	58%
Noon - 3 PM	73%	86%
3-6 PM	79%	87%
6-10 PM	59%	71%

Time	Light	Heavy
6-9 AM	64%	66%
9 AM - Noon	64%	56%
Noon - 3 PM	61%	46%
3-6 PM	59%	36%
6-10 PM	55%	41%

Time	Light	Heavy
6 AM - 10 PM	5%	0%

Time	Light	Heavy
6 AM - 10 PM	5%	0%

Time	Light	Heavy
6-9 AM	31%	34%
9 AM - Noon	31%	44%
Noon - 3 PM	34%	54%
3-6 PM	36%	64%
6-10 PM	40%	59%

Time	Light	Heavy
6-9 AM	39%	47%
9 AM - Noon	22%	42%
Noon - 3 PM	22%	14%
3-6 PM	16%	13%
6-10 PM	36%	29%

- Intersections - LOS A-D is always to be maintained; provided, LOS E or F may be acceptable if improvements are made to the overall transportation system and/or non-vehicular transportation and transit are promoted as part of the project or a City initiated project.

INTERSECTIONS – SACRAMENTO COUNTY

- Result in an unsignalized intersection movement / approach operating at an acceptable LOS to deteriorate to an unacceptable LOS, and also cause the intersection to meet a traffic signal warrant; or
- For an unsignalized intersection that meets a signal warrant, increase the delay by more than 5 seconds at a movement / approach that is operating at an unacceptable LOS without the project.

TRANSIT – CITY OF SACRAMENTO

- Adversely affect public transit operations,
- Fail to adequately provide access to transit.

TRANSIT – SACRAMENTO COUNTY

- Eliminate or adversely affect existing transit access, or operations; or
- Interfere with the implementation of transit service as planned in the Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP/SCS); or
- Substantially increase transit demand and fail to provide adequate transit service

BICYCLE FACILITIES – CITY OF SACRAMENTO

- Adversely affect existing or planned bicycle facilities,
- Fail to adequately provide for access by bicycle.

PEDESTRIAN CIRCULATION – CITY OF SACRAMENTO

- Adversely affect existing or planned pedestrian facilities,
- Fail to adequately provide for access by pedestrians.

BICYCLE AND PEDESTRIAN FACILITIES – SACRAMENTO COUNTY

- Eliminate or adversely affect an existing bikeway or pedestrian facility in a way that would discourage its use;
- Interfere with the implementation of a planned bikeway as shown in the Bicycle Master Plan, or be in conflict with the Pedestrian Master Plan; or
- Fail to provide adequate access for bicyclists and pedestrians, resulting in unsafe conditions, including unsafe bicycle / pedestrian, bicycle / motor vehicle, or pedestrian / motor vehicle conflicts.

CONSTRUCTION-RELATED TRAFFIC IMPACTS – CITY OF SACRAMENTO

- Degrade an intersection or roadway to an unacceptable level,
- Cause inconveniences to motorists due to prolonged road closures, or
- Result in increased frequency of potential conflicts between vehicles, pedestrians, and bicyclists.

SUBSTANDARD RURAL ROADWAY FUNCTIONALITY – SACRAMENTO COUNTY

- Cause the substandard rural roadway to exceed an average daily traffic volume of 6,000 daily vehicles; or
- Add 600 or more new daily vehicle trips to a substandard rural roadway that already carries 6,000 or more daily vehicles.

SAFETY – SACRAMENTO COUNTY

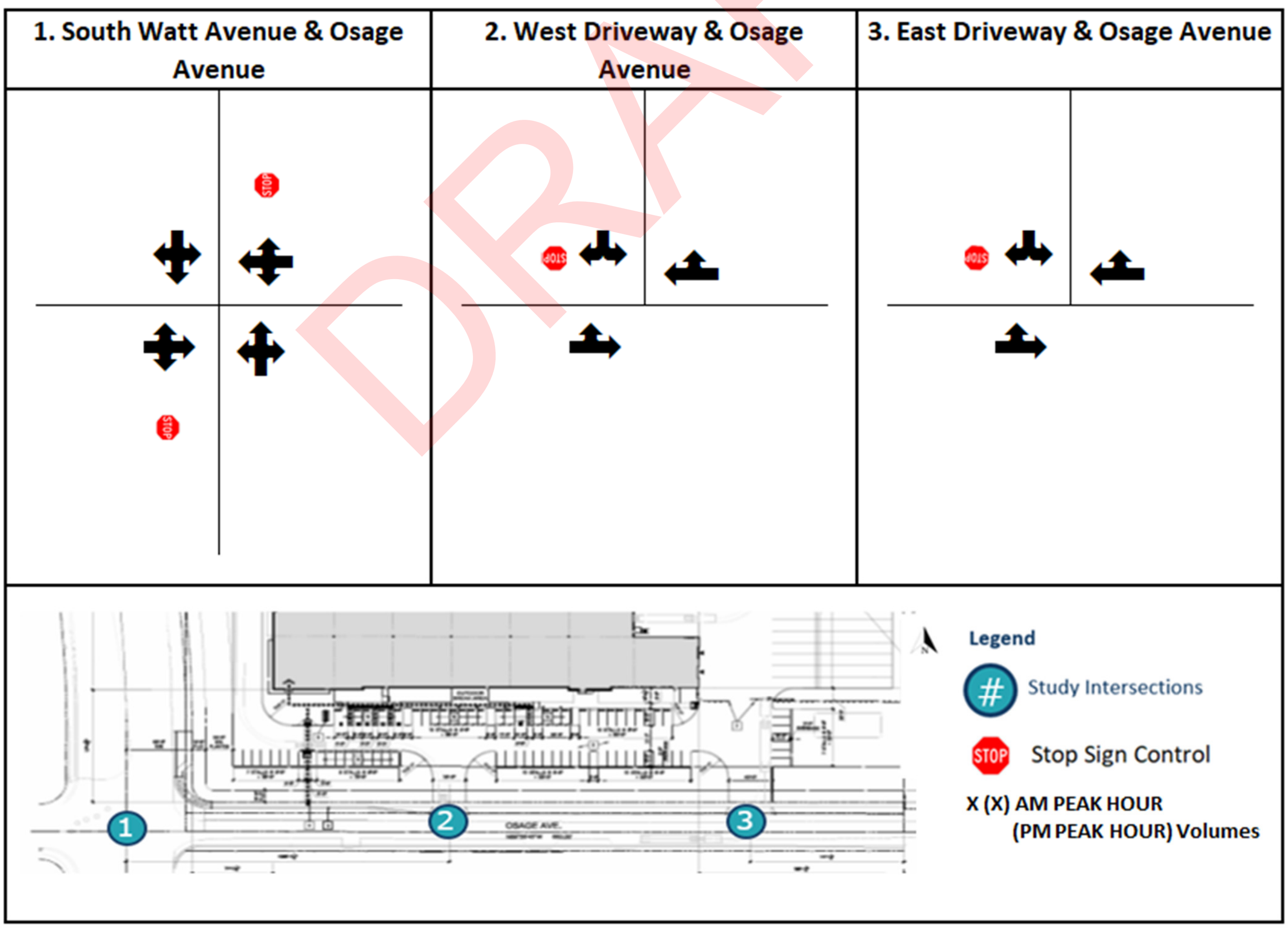
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

EXISTING PLUS PROJECT TRAFFIC CONDITIONS

EXISTING PLUS PROJECT INTERSECTION LANE CONFIGURATION

Existing plus project intersection lane configuration is illustrated in **Figure 10**. At Intersection 1, no changes from existing condition are assumed.

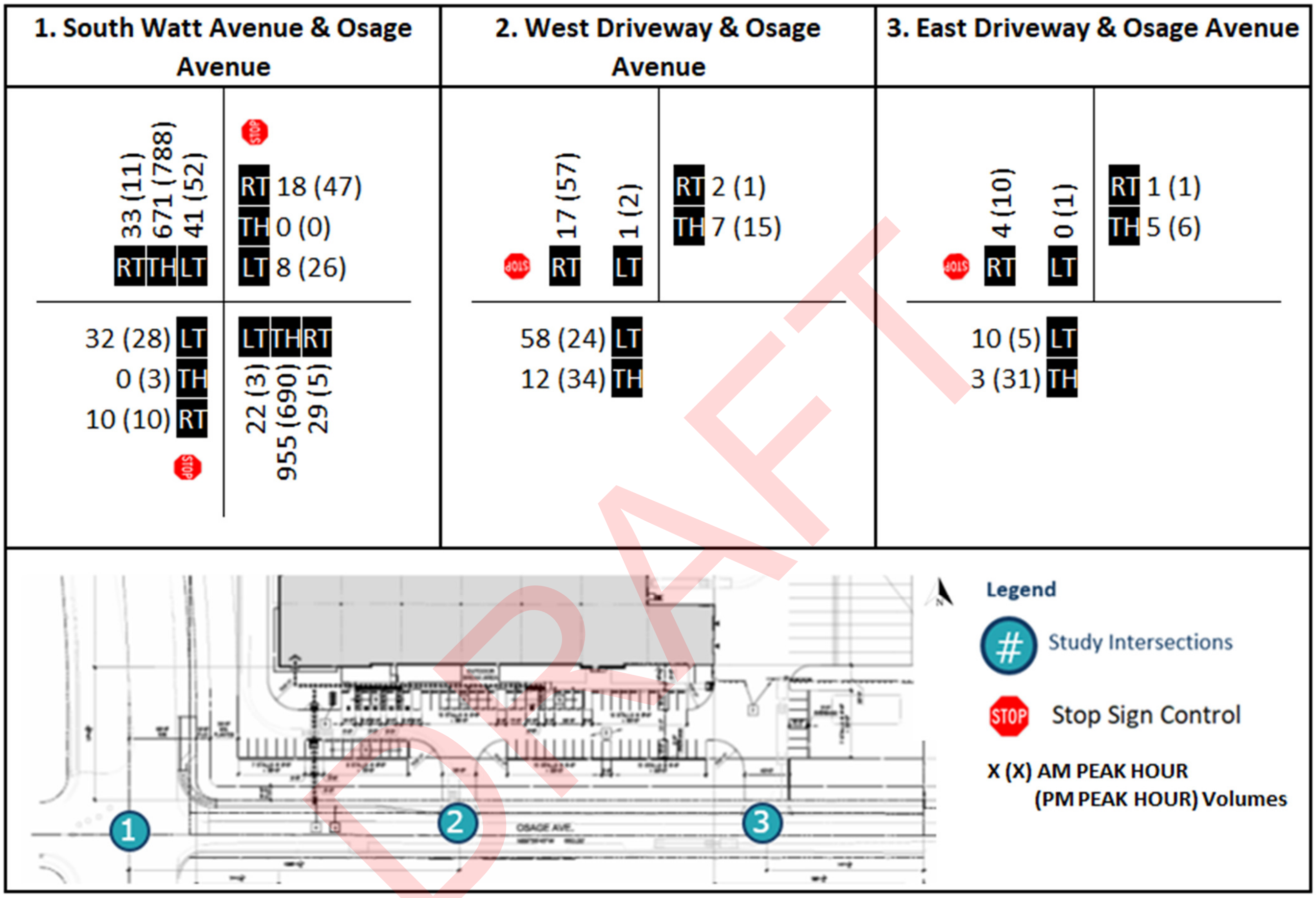
FIGURE 10. EXISTING PLUS PROJECT INTERSECTION LANE CONFIGURATION



EXISTING PLUS PROJECT TRAFFIC VOLUMES

Existing plus project traffic volumes were calculated by adding the trips associated with the project to existing traffic volumes. **Figure 11** illustrates the baseline plus project peak hour traffic volumes used in the analysis.

FIGURE 11. EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES



RESULTS OF EXISTING PLUS PROJECT CONDITION ANALYSIS

Existing plus project condition intersection analysis results are summarized in **Table 7.**

- Intersection 1 would continue to operate at LOS A overall. However, the stop-sign controlled eastbound approach would remain at LOS F with increased delay. The westbound stop-sign controlled approach would operate at LOS E in both peak hours.
- Intersections 2 and 3 would operate at LOS A overall, and at LOS A for all controlled movements.

TABLE 7. EXISTING PLUS PROJECT INTERSECTION OPERATION ANALYSIS

INTERSECTION	EXISTING				EXISTING PLUS PROJECT			
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS	DELAY (SECONDS)	LOS
1. Osage Avenue & South Watt Avenue	2.8	A	1.7	A	5.3	A	4.3	A
- Northbound left turn	*9.6*	*A*	*9.3*	*A*	*9.6*	*A*	*9.3*	*A*
- Southbound left turn	*10.0*	*A*	*9.1*	*A*	*10.5*	*B*	*9.3*	*A*
- Eastbound	*109.3*	*F*	*56.7*	*F*	*188.7*	*F*	*80.3*	*F*
- Westbound	*18.3*	*C*	*13.1*	*B*	*42.7*	*E*	*46.0*	*E*
2. Osage Avenue & West Driveway	-	-	-	-	5.9	A	5.1	A
- Southbound	-	-	-	-	*8.4*	*A*	*8.6*	*A*
- Eastbound left turn	-	-	-	-	*7.3*	*A*	*7.3*	*A*
3. Osage Avenue & East Driveway	-	-	-	-	4.8	A	2.5	A
- Southbound	-	-	-	-	*8.8*	*A*	*8.6*	*A*
- Eastbound left turn	-	-	-	-	*7.4*	*A*	*7.6*	*A*

TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic signal warrant analysis was conducted for Intersection 1. Details of the warrant analysis are included in the Appendix.

WARRANT 1: EIGHT-HOUR VEHICULAR VOLUME

The volumes at Intersection 1 meet Warrant 1 (Eight-Hour Vehicular Volume), Condition B (Interruption of Continuous Traffic) for eleven unique hours:

- 5:45 to 6:45 AM
- 6:45 to 7:45 AM
- 7:45 to 8:45 AM
- 9:30 to 10:30 AM
- 11:15 AM to 12:15 PM
- 12:15 to 1:15 PM
- 1:15 to 2:15 PM
- 2:15 to 3:15 PM
- 3:15 to 4:15 PM
- 4:15 to 5:15 PM
- 5:15 to 6:15 PM

WARRANT 2: FOUR-HOUR VEHICULAR VOLUME

The volumes at Intersection 2 meet Warrant 2 (Four-Hour Vehicular Volume) for five unique hours:

- 6:00 to 7:00 AM
- 7:00 to 8:00 AM
- 2:00 to 3:00 PM
- 3:00 to 4:00 PM
- 4:00 to 5:00 PM

WARRANT 3: PEAK HOUR VEHICULAR VOLUME

Warrant 3 (Peak Hour Vehicular Volume) is not satisfied.

IMPACTS AND MITIGATION MEASURES

Impact 1:
The proposed project would increase traffic volume and delay at study area intersections under the existing plus project scenario. Based on the analysis below, the impact is significant.

As summarized in Table 7, the project would increase traffic volumes and average delay at Intersection 1. While the LOS would remain at A overall, the Osage Avenue side street approaches would operate at LOS F (eastbound) and LOS E (westbound) during the peak hours. The increase in eastbound delay (more than 5 seconds) exceeds the Sacramento County threshold of significance, as the intersection warrants a traffic signal.

While Intersections 2 and 3 operate at an acceptable LOS A, existing Osage Avenue pavement width and condition is unsuitable for access to an industrial facility.

Mitigation Measure 1:
Improve the intersection of Osage Avenue and South Watt Avenue as follows:

- Install a traffic signal at the intersection, coordinated with the South Watt Avenue traffic signal system.
- Upgrade the intersection geometrics to City and County design guidelines, capable of accommodating heavy vehicles (typically WB-67 semi-trailer). This shall include, at a minimum:
  - Northbound approach – provide a left turn lane 200 feet long, and a through and right turn lane.
  - Southbound approach – provide a left turn lane 200 feet long, and a through and right turn lane.
  - Eastbound approach – restripe the existing pavement (40 feet wide) to accommodate a left turn lane 150 feet long and a through and right turn lane.
  - Westbound approach – provide a left turn lane 150 feet long, and a through and right turn lane.

- Accommodate pedestrian and bicycle movements at the intersection in accordance with City and County design guidelines.

Upgrade Osage Avenue along the site frontage. These improvements shall include an industrial local street cross-section north of the center line, and a reconstructed eastbound travel lane, shoulder, and drainage south of the center line.

With mitigation, Intersection 1 will operate at LOS B (17.1 seconds average delay) during the AM peak hour, and at LOS B (14.8 seconds average delay) during the PM peak hour.

Impact 2:
The proposed project could cause potentially significant impacts to transit. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect public transit operations. The project would not modify or impede any existing or planned transit facilities / routes.

Mitigation Measure 2:
None required.

Impact 3:
The proposed project could cause potentially significant impacts to pedestrian facilities. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect existing or planned pedestrian facilities. The project will include sidewalks along the project frontage. Mitigation measure 1 would include pedestrian crosswalks at Intersection 1, which will improve pedestrian access.

Mitigation Measure 3:
None required.

Impact 4:
The proposed project could cause potentially significant impacts to bicycle facilities. Based on the analysis below, the impact is less than significant.

The proposed project would not adversely affect existing or planned bicycle facilities.

Mitigation Measure 4:
None required.

Impact 5:
The proposed project could cause potentially significant impacts due to construction-related activities. Based on the analysis below, the impact is less than significant.

The City Code (City Code 12.20.030) requires that a construction traffic control plan be prepared and approved prior to the beginning of project construction, to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies. All work performed during construction must conform to the conditions and requirements of the approved plan. The plan shall ensure that safe and efficient movement of traffic through the construction work zone(s) is maintained. At a minimum, the plan shall include the following:

- Time and day of street closures
- Proper advance warning and posted signage regarding street closures
- Provision of driveway access plan to ensure safe vehicular, pedestrian, and bicycle movements
- Safe and efficient access routes for emergency vehicles
- Provisions for pedestrian safety
- Use of manual traffic control when necessary
- Number of anticipated truck trips, and time of day of arrival and departure of trucks
- Provision of a truck circulation pattern and staging area with a limitation on the number of trucks that can be waiting and any limitations on the size and type of trucks appropriate for the surrounding transportation network
- The plan must be available at the site for inspection by the City representative during all work. With the implementation of the traffic control plan, local roadways and freeway facilities will continue to operate at acceptable operating conditions and the impact of the project would be less than significant.

Mitigation Measure 5:
None required.

Impact 6:
The proposed project would add traffic to a substandard rural roadway. Based on the analysis below, the impact is less than significant.

Osage Avenue east of South Watt Avenue does not meet current County standards. Mitigation measure 1 would improve Osage Avenue along the site frontage, but not east of the site. The current estimated daily volume on Osage Avenue is 225 vehicles. An estimated 5 percent of site traffic would use Osage Avenue to and from the east, increasing the daily traffic volume to 261 vehicles. As the Osage Avenue daily volume east of the site would not exceed 6,000 vehicles, the project’s impact does not exceed the County threshold.

Mitigation Measure 6:
None required.

Impact 7:
The proposed project could substantially increase hazards. Based on the analysis below, the impact is less than significant.

The design of the project, its modifications to the existing roadway system, and its access points will conform with City and County design guidelines. No substandard or atypical features are proposed. The project will not introduce and sharp curves, dangerous intersections, or incompatible uses.

Mitigation Measure 7:
None required.

ON-SITE OPERATIONS REVIEW AND QUEUING

The project site plan was reviewed for conformity with accepted traffic engineering principles and City Design Guidelines. **Figure 3** shows the project site plan.

INTERSECTION AND DRIVEWAY SPACING

The review of driveway spacing is based upon traffic engineering principles to maintain efficient movement for motorized vehicles, pedestrians, and bicyclists, and minimize conflicts and crashes. Research has shown that proper spacing of intersections and driveways reduces crash frequency, as motorists have ample time between decision points to react to other vehicles that may affect their movement.

The proposed site plan includes two driveways. The west driveway is about 235 feet from Watt Avenue, measured inside curb to inside curb. This is beyond the intersection influence area for Intersection 1. The east driveway is about 240 feet from the west driveway, measured inside curb to inside curb. This spacing is acceptable as it provides adequate distance between intersections for sight distance, decision-making, and queuing.

DRIVEWAY THROAT LENGTHS AND INTERSECTION QUEUING

The “throat length” of a driveway is defined as the distance from the outer edge of the traveled way of the intersecting roadway to the first point along the driveway at which there are conflicting vehicular traffic movements. Conflicting movements include turning vehicles and vehicles entering / exiting parking stalls. Adequate throat length is critical to ensure that queued exiting vehicles do not interfere with / block entering vehicles, resulting in entering queues extending onto city sidewalks and / or streets.

Adequate queuing distance is necessary in turning lanes so that queued vehicles do not back into through travel lanes and disrupt normal traffic operations.

Based upon the peak period intersection analysis, it is recommended that a minimum throat length of 50 feet (to accommodate two light vehicles) be provided at the west driveway. The proposed site plan meets the criteria.

At the east driveway, it is recommended that a minimum throat length of 75 feet be provided, to accommodate one semi-trailer vehicle. To meet this recommendation, the first two parking spaces located on the east side of the east driveway should be removed or relocated. Removal of these spaces would not affect conformity with the auto parking requirement, based upon the site plan tabulations.

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APPENDICES

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TRAFFIC COUNTS - 2018

National Data & Surveying Services

Intersection Turning Movement Count

Location: S Watt Ave & Fruitridge Rd
City: Sacramento
Control:

Project ID: 18-07351-001
Date: 10/2/2018

Total

NS/EW Streets:	S Watt Ave				S Watt Ave				Fruitridge Rd				Fruitridge Rd						
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND					South Leg	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL	NB	SB
7:00 AM	23	188	1	3	1	141	74	1	46	24	19	6	10	35	3	0	575		
7:15 AM	28	204	2	0	7	181	78	1	39	26	12	9	13	58	3	0	661		
7:30 AM	35	202	13	0	3	162	86	1	44	45	7	10	17	42	2	1	670		
7:45 AM	39	188	24	1	4	127	105	0	35	48	17	6	23	73	1	0	691	951	733
8:00 AM	25	207	12	4	3	133	81	0	52	42	12	8	16	55	2	0	652		
8:15 AM	24	181	2	3	3	142	86	2	59	27	11	7	10	52	6	0	615		
8:30 AM	33	215	5	2	3	136	70	1	52	23	15	6	6	41	4	1	613		
8:45 AM	18	176	1	2	1	147	96	1	57	21	14	5	6	26	2	0	573	910	659
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL		
TOTAL VOLUMES :	225	1561	60	15	25	1169	676	7	384	256	107	57	101	382	23	2	5050		
APPROACH %'s :	12.09%	83.88%	3.22%	0.81%	1.33%	62.28%	36.01%	0.37%	47.76%	31.84%	13.31%	7.09%	19.88%	75.20%	4.53%	0.39%			
PEAK HR :	07:15 AM - 08:15 AM																TOTAL		
PEAK HR VOL :	127	801	51	5	17	603	350	2	170	161	48	33	69	228	8	1	2674		
PEAK HR FACTOR :	0.814	0.967	0.531	0.313	0.607	0.833	0.833	0.500	0.817	0.839	0.706	0.825	0.750	0.781	0.667	0.250	0.967		
	0.976				0.910				0.904				0.789						

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND						
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL		
4:00 PM	17	142	8	1	11	176	71	2	128	62	25	11	3	45	3	0	705		
4:15 PM	28	151	5	6	10	210	50	3	88	42	14	7	2	34	1	0	651		
4:30 PM	25	130	6	2	14	143	63	1	140	58	17	4	2	42	3	0	650		
4:45 PM	28	122	4	5	17	209	78	1	82	44	16	8	2	37	1	0	654	680	833
5:00 PM	26	139	5	1	10	187	63	1	125	60	15	6	3	34	1	0	676		
5:15 PM	32	147	8	1	27	166	64	1	76	44	16	8	2	29	2	0	623		
5:30 PM	15	137	4	1	11	172	71	0	70	41	14	7	1	44	1	0	589		
5:45 PM	23	135	4	2	6	172	61	2	62	29	14	5	7	39	1	0	562	680	774
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL		
TOTAL VOLUMES :	194	1103	44	19	106	1435	521	11	771	380	131	56	22	304	13	0	5110		
APPROACH %'s :	14.26%	81.10%	3.24%	1.40%	5.11%	69.22%	25.13%	0.53%	57.62%	28.40%	9.79%	4.19%	6.49%	89.68%	3.83%	0.00%			
PEAK HR :	04:00 PM - 05:00 PM																TOTAL		
PEAK HR VOL :	98	545	23	14	52	738	262	7	438	206	72	30	9	158	8	0	2660		
PEAK HR FACTOR :	0.875	0.902	0.719	0.583	0.765	0.879	0.840	0.583	0.782	0.831	0.720	0.682	0.750	0.878	0.667	0.000	0.943		
	0.895				0.868				0.825				0.858						

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TRAFFIC COUNTS - 2021

All Traffic Data Services

1 S WATT AVE & OSAGE AVE AM
Wednesday, October 13, 2021

Peak Hour
07:15 AM - 08:15 AM
Peak 15-Minutes
07:30 AM - 07:45 AM

Traffic Counts - All Vehicles

	OSAGE AVE					OSAGE AVE					S WATT AVE					S WATT AVE						
	Eastbound					Westbound					Northbound					Southbound						Rolling
Time	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	Total	Hour
6:00 AM	0	4	3	7	0	0	0	0	1	0	0	5	167	0	0	0	1	96	7	0	291	1,287
6:15 AM	0	6	0	0	0	0	1	0	0	0	0	10	158	1	0	0	3	115	6	0	300	1,342
6:30 AM	0	11	0	2	0	0	2	0	2	0	0	16	153	0	0	0	1	109	5	0	301	1,398
6:45 AM	0	9	0	5	0	0	0	0	0	0	0	6	167	0	0	0	3	191	14	0	395	1,486
7:00 AM	0	10	2	1	0	0	0	0	3	0	0	4	168	0	0	0	0	147	11	0	346	1,467
7:15 AM	0	9	0	3	0	0	0	0	1	0	0	4	207	0	0	0	0	127	5	0	356	1,506
7:30 AM	0	7	0	2	0	0	0	0	0	0	0	3	211	0	0	0	0	158	8	0	389	1,495
7:45 AM	0	7	0	3	0	0	0	0	1	0	0	8	194	0	0	0	1	152	10	0	376	1,476
8:00 AM	0	5	0	2	0	0	0	0	1	0	0	4	225	1	0	0	0	142	5	0	385	1,416
8:15 AM	0	2	1	3	0	0	0	0	0	0	0	2	195	0	0	0	0	136	6	0	345	1,325
8:30 AM	0	4	0	4	0	0	0	0	0	0	0	2	207	0	0	0	1	146	6	0	370	1,269
8:45 AM	0	2	0	3	0	0	1	0	2	0	0	1	169	1	0	0	2	129	6	0	316	1,195
9:00 AM	0	3	0	2	0	0	0	0	0	0	0	1	155	0	0	0	0	123	10	0	294	1,182
9:15 AM	0	4	0	3	0	0	0	0	0	0	0	3	146	0	0	0	0	124	9	0	289	1,136
9:30 AM	0	7	0	4	0	0	0	0	0	0	0	1	158	0	0	0	1	112	13	0	296	1,122
9:45 AM	0	5	0	4	0	0	0	0	1	0	0	5	141	1	0	0	0	139	7	0	303	1,092
10:00 AM	0	11	0	0	0	0	0	0	0	0	0	4	118	0	0	0	1	110	4	0	248	1,041
10:15 AM	0	6	0	2	0	0	0	0	0	0	0	2	134	0	0	0	0	125	6	0	275	1,055
10:30 AM	0	4	0	1	0	0	0	0	0	0	0	1	134	0	0	0	0	122	4	0	266	1,025
10:45 AM	0	11	0	1	0	0	1	0	0	0	0	3	117	0	0	0	2	115	2	0	252	1,044
11:00 AM	0	0	0	6	0	0	0	0	1	0	0	3	127	0	0	0	2	119	4	0	262	1,074
11:15 AM	0	6	0	3	0	0	0	0	1	0	0	3	111	0	0	0	0	116	5	0	245	1,103
11:30 AM	0	3	0	3	0	0	0	0	0	0	0	2	131	0	0	0	2	140	4	0	285	1,127
11:45 AM	0	2	0	5	0	0	1	0	0	0	0	0	123	0	0	0	0	144	7	0	282	1,171
12:00 PM	0	5	1	3	0	0	0	0	0	0	0	2	119	0	0	0	2	150	9	0	291	1,178
12:15 PM	0	7	0	3	0	0	0	0	0	0	0	2	136	0	0	0	0	114	7	0	269	1,169
12:30 PM	0	4	0	3	0	0	0	0	0	0	0	1	165	3	0	0	2	147	4	0	329	1,206
12:45 PM	0	4	0	2	0	0	1	0	0	0	0	0	132	0	0	0	1	144	5	0	289	1,167
1:00 PM	0	3	0	3	0	0	0	0	1	0	0	2	112	0	0	0	0	156	5	0	282	1,251
1:15 PM	0	3	0	2	0	0	0	0	2	0	0	1	144	0	0	0	1	151	2	0	306	1,319
1:30 PM	0	5	0	1	0	0	0	0	0	0	0	0	123	0	0	0	0	155	6	0	290	1,366
1:45 PM	0	2	0	7	0	0	0	0	0	0	0	1	159	0	0	1	2	196	5	0	373	1,444
2:00 PM	0	5	0	8	0	0	0	0	0	0	0	5	158	0	0	0	1	165	8	0	350	1,407
2:15 PM	0	2	0	2	0	0	0	0	0	0	0	0	159	0	0	0	3	185	2	0	353	1,394
2:30 PM	0	6	0	0	0	0	1	0	1	0	0	2	176	2	0	0	3	171	6	0	368	1,364
2:45 PM	0	15	1	6	0	0	0	0	2	0	0	0	151	0	0	0	6	140	15	0	336	1,370
3:00 PM	0	6	2	10	0	0	1	0	0	0	0	1	140	0	0	0	2	172	3	0	337	1,371
3:15 PM	0	4	1	2	0	0	0	0	0	0	0	0	153	0	0	0	2	155	6	0	323	1,384
3:30 PM	0	6	0	7	0	0	0	0	0	0	0	3	183	0	0	0	3	165	7	0	374	1,394
3:45 PM	0	3	0	5	0	0	0	0	0	0	0	0	164	1	0	0	7	150	7	0	337	1,399
4:00 PM	0	5	1	4	0	0	0	0	1	0	0	0	158	0	0	1	5	172	3	0	350	1,381
4:15 PM	0	8	1	0	0	0	0	0	1	0	0	0	155	0	0	0	5	157	6	0	333	1,427
4:30 PM	0	7	0	3	0	0	0	0	1	0	0	0	182	0	0	0	6	177	3	0	379	1,461
4:45 PM	0	5	0	3	0	0	0	0	2	0	0	1	155	0	0	0	2	147	4	0	319	1,415
5:00 PM	0	13	2	3	0	0	0	0	1	0	0	1	177	0	0	0	10	189	0	0	396	1,414
5:15 PM	0	3	1	1	0	0	0	0	1	0	0	1	168	0	0	1	4	184	3	0	367	1,306
5:30 PM	0	2	0	2	0	0	0	0	1	0	0	0	157	0	0	0	2	166	3	0	333	1,232
5:45 PM	0	0	0	4	0	0	0	0	0	0	0	0	136	0	0	0	5	170	3	0	318	1,167
6:00 PM	0	2	0	1	0	0	0	0	2	0	0	0	131	2	0	0	1	147	2	0	288	1,124
6:15 PM	0	0	0	2	0	0	0	0	1	0	0	2	114	0	0	0	2	171	1	0	293	1,084
6:30 PM	0	1	0	0	0	0	1	0	1	0	0	0	114	1	0	0	2	148	0	0	268	970
6:45 PM	0	1	0	1	0	0	1	0	1	0	0	0	115	3	0	0	0	150	3	0	275	871
7:00 PM	0	0	0	2	0	0	1	0	0	0	0	0	92	1	0	0	2	150	0	0	248	782
7:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	65	0	0	0	0	112	0	0	179	718
7:30 PM	0	0	0	0	0	0	0	0	2	0	0	0	71	1	0	0	0	94	1	0	169	709
7:45 PM	0	1	0	0	0	0	0	0	0	0	0	2	67	0	0	0	0	112	4	0	186	708
8:00 PM	0	2	0	3	0	0	0	0	0	0	0	0	83	0	0	0	1	95	0	0	184	659
8:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	74	0	0	0	0	95	0	0	170	605
8:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	68	0	0	0	0	99	0	0	168	554
8:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	71	0	0	0	0	65	0	0	137	515
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	66	0	0	130	486
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	1	73	0	0	119	0
9:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	63	0	0	0	0	64	0	0	129	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	2	60	0	0	108	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound					Westbound					Northbound					Southbound					
	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	Total
Articulated Trucks	0	2	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0	30	2	0	60
Lights	0	18	0	8	0	0	0	0	2	0	0	16	778	1	0	0	1	521	19	0	1,364
Mediums	0	8	0	2	0	0	0	0	1	0	0	3	33	0	0	0	0	28	7	0	82
Total	0	28	0	10	0	0	0	0	3	0	0	19	837	1	0	0	1	579	28	0	1,506
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Bicycles on Crosswalk			1					0					0					0			1
Heavy Vehicle Percentage			31.6%					33.3%					7.2%					11.0%			9.4%
Heavy Vehicle Percentage	0.0%	35.7%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	0.0%	15.8%	7.0%	0.0%	0.0%	0.0%	0.0%	10.0%	32.1%	0.0%	9.4%
Peak Hour Factor (PHF)			0.68					0.50					0.93					0.92			0.97
Peak Hour Factor (PHF)	0.00	0.89	0.50	0.63	0.00	0.00	0.38	0.00	0.50	0.00	0.00	0.58	0.93	0.50	0.00	0.25	0.58	0.91	0.75	0.00	0.97

Traffic Counts by Vehicle Type

Time	Eastbound					Westbound					Northbound					Southbound					
	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	Total
Articulated Trucks																					
6:00 AM	0	1	0	3	0	0	0	0	0	0	0	2	9	0	0	0	0	3	0	0	18
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	2	0	0	11
6:30 AM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	5
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	3	0	0	12
7:00 AM	0	0	2	0	0	0	0	0	0	0	0	2	4	0	0	0	0	7	0	0	15
7:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	5	1	0	16
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	8	0	0	14
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	5	0	0	11
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	12	1	0	19
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	6	0	0	16
8:30 AM	0	0	0	2	0	0	0	0	0	0	0	1	4	0	0	0	0	9	1	0	17
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	12	1	0	18
9:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	0	0	12	0	0	19
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	10	1	0	16
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	9	1	0	24
9:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	0	0	18	0	0	25
10:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	14	0	0	19
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	14	0	0	23
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	12	0	0	20
10:45 AM	0	1	0	1	0	0	0	0	0	0	0	1	4	0	0	0	0	9	0	0	16
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	8	0	0	14
11:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	6	1	0	10
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	6	0	0	10
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	11	1	0	16
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	10	0	0	14
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	10	0	0	17
12:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	9
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	11	0	0	16
1:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	12	0	0	14
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	12	0	0	18
1:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	13	3	0	20
1:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	3	0	0	0	0	11	0	0	16
2:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	0	0	6	2	0	15
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	8	0	0	12
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	5	1	0	8
2:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	4	0	11
3:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	9	1	0	14
3:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	0	0	13
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	6	1	0	8
3:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	5	0	0	8
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	1	0	13
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	6
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	4
6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	5
6:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3	1	0	6
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	4
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	3
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Counts by Vehicle Type

Time	Eastbound U-Turn	Eastbound Left	Eastbound Thru	Eastbound Right	Eastbound RTOR	Westbound U-Turn	Westbound Left	Westbound Thru	Westbound Right	Westbound RTOR	Northbound U-Turn	Northbound Left	Northbound Thru	Northbound Right	Northbound RTOR	Southbound U-Turn	Southbound Left	Southbound Thru	Southbound Right	Southbound RTOR	Total
Lights																					
6:00 AM	0	1	0	2	0	0	0	0	1	0	0	2	148	0	0	0	1	86	6	0	247
6:15 AM	0	0	0	0	0	0	1	0	0	0	0	7	138	1	0	0	3	107	4	0	261
6:30 AM	0	5	0	1	0	0	2	0	2	0	0	13	140	0	0	0	1	99	3	0	266
6:45 AM	0	7	0	1	0	0	0	0	0	0	0	5	149	0	0	0	3	184	9	0	358
7:00 AM	0	3	0	1	0	0	0	0	3	0	0	0	151	0	0	0	0	135	10	0	303
7:15 AM	0	3	0	3	0	0	0	0	1	0	0	3	192	0	0	0	0	115	2	0	319
7:30 AM	0	6	0	2	0	0	0	0	0	0	0	3	199	0	0	0	0	143	7	0	360
7:45 AM	0	6	0	3	0	0	0	0	0	0	0	7	178	0	0	0	1	142	8	0	345
8:00 AM	0	3	0	0	0	0	0	0	1	0	0	3	209	1	0	0	0	121	2	0	340
8:15 AM	0	1	1	2	0	0	0	0	0	0	0	1	177	0	0	0	0	127	5	0	314
8:30 AM	0	2	0	1	0	0	0	0	0	0	0	1	196	0	0	0	1	127	4	0	332
8:45 AM	0	2	0	3	0	0	1	0	2	0	0	0	156	1	0	0	2	114	4	0	285
9:00 AM	0	1	0	0	0	0	0	0	0	0	0	1	145	0	0	0	0	106	7	0	260
9:15 AM	0	4	0	1	0	0	0	0	0	0	0	2	131	0	0	0	0	109	8	0	255
9:30 AM	0	6	0	4	0	0	0	0	0	0	0	1	134	0	0	0	1	101	12	0	259
9:45 AM	0	3	0	1	0	0	0	0	1	0	0	3	125	1	0	0	0	117	5	0	256
10:00 AM	0	7	0	0	0	0	0	0	0	0	0	2	104	0	0	0	1	90	3	0	207
10:15 AM	0	4	0	2	0	0	0	0	0	0	0	0	115	0	0	0	0	106	3	0	230
10:30 AM	0	3	0	0	0	0	0	0	0	0	0	1	114	0	0	0	0	106	3	0	227
10:45 AM	0	9	0	0	0	0	1	0	0	0	0	2	103	0	0	0	2	97	2	0	216
11:00 AM	0	0	0	6	0	0	0	0	1	0	0	3	113	0	0	0	2	106	3	0	234
11:15 AM	0	4	0	2	0	0	0	0	1	0	0	2	100	0	0	0	0	104	4	0	217
11:30 AM	0	2	0	2	0	0	0	0	0	0	0	1	112	0	0	0	2	129	4	0	252
11:45 AM	0	2	0	4	0	0	1	0	0	0	0	0	114	0	0	0	0	125	5	0	251
12:00 PM	0	4	0	3	0	0	0	0	0	0	0	1	112	0	0	0	2	130	6	0	258
12:15 PM	0	7	0	2	0	0	0	0	0	0	0	2	124	0	0	0	0	100	7	0	242
12:30 PM	0	4	0	2	0	0	0	0	0	0	0	0	151	2	0	0	2	132	4	0	297
12:45 PM	0	3	0	1	0	0	1	0	0	0	0	0	118	0	0	0	1	123	4	0	251
1:00 PM	0	2	0	1	0	0	0	0	1	0	0	2	102	0	0	0	0	139	3	0	250
1:15 PM	0	3	0	2	0	0	0	0	2	0	0	1	132	0	0	0	1	133	2	0	276
1:30 PM	0	2	0	1	0	0	0	0	0	0	0	0	118	0	0	0	0	139	3	0	263
1:45 PM	0	2	0	4	0	0	0	0	0	0	0	1	147	0	0	1	2	179	4	0	340
2:00 PM	0	5	0	5	0	0	0	0	0	0	0	5	148	0	0	0	1	146	3	0	313
2:15 PM	0	2	0	2	0	0	0	0	0	0	0	0	149	0	0	0	3	162	1	0	319
2:30 PM	0	5	0	0	0	0	1	0	1	0	0	1	170	2	0	0	2	150	2	0	334
2:45 PM	0	10	0	4	0	0	0	0	2	0	0	0	143	0	0	0	6	128	5	0	298
3:00 PM	0	3	2	8	0	0	1	0	0	0	0	1	134	0	0	0	2	156	2	0	309
3:15 PM	0	3	1	1	0	0	0	0	0	0	0	0	145	0	0	0	2	139	3	0	294
3:30 PM	0	6	0	4	0	0	0	0	0	0	0	1	178	0	0	0	3	152	5	0	349
3:45 PM	0	3	0	4	0	0	0	0	0	0	0	0	157	1	0	0	7	140	4	0	316
4:00 PM	0	5	1	4	0	0	0	0	1	0	0	0	153	0	0	1	5	160	1	0	331
4:15 PM	0	7	0	0	0	0	0	0	1	0	0	0	151	0	0	0	5	152	2	0	318
4:30 PM	0	7	0	2	0	0	0	0	1	0	0	0	180	0	0	0	5	172	2	0	369
4:45 PM	0	4	0	2	0	0	0	0	2	0	0	1	154	0	0	0	2	139	1	0	305
5:00 PM	0	13	2	3	0	0	0	0	1	0	0	1	176	0	0	0	10	183	0	0	389
5:15 PM	0	3	1	1	0	0	0	0	1	0	0	1	168	0	0	1	4	177	2	0	359
5:30 PM	0	2	0	2	0	0	0	0	1	0	0	0	153	0	0	0	2	159	1	0	320
5:45 PM	0	0	0	3	0	0	0	0	0	0	0	0	132	0	0	0	5	163	2	0	305
6:00 PM	0	1	0	1	0	0	0	0	2	0	0	0	128	2	0	0	1	143	1	0	279
6:15 PM	0	0	0	1	0	0	0	0	1	0	0	2	113	0	0	0	2	166	0	0	285
6:30 PM	0	1	0	0	0	0	1	0	1	0	0	0	113	1	0	0	2	146	0	0	265
6:45 PM	0	1	0	1	0	0	1	0	1	0	0	0	115	3	0	0	0	143	1	0	266
7:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	92	1	0	0	2	146	0	0	242
7:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	64	0	0	0	0	111	0	0	177
7:30 PM	0	0	0	0	0	0	0	0	2	0	0	0	71	1	0	0	0	89	0	0	163
7:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0	112	3	0	181
8:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	81	0	0	0	1	93	0	0	177
8:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	73	0	0	0	0	92	0	0	166
8:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	97	0	0	162
8:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	71	0	0	0	0	65	0	0	137
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	63	0	0	0	0	66	0	0	129
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	1	72	0	0	117
9:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	62	0	0	0	0	64	0	0	128
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	2	60	0	0	108

Traffic Counts by Vehicle Type

Time	Eastbound					Westbound					Northbound					Southbound					
	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	Total
Mediums																					
6:00 AM	0	2	3	2	0	0	0	0	0	0	0	1	10	0	0	0	0	7	1	0	26
6:15 AM	0	6	0	0	0	0	0	0	0	0	0	2	12	0	0	0	0	6	2	0	28
6:30 AM	0	4	0	0	0	0	0	0	0	0	0	3	13	0	0	0	0	8	2	0	30
6:45 AM	0	2	0	4	0	0	0	0	0	0	0	0	10	0	0	0	0	4	5	0	25
7:00 AM	0	7	0	0	0	0	0	0	0	0	0	2	13	0	0	0	0	5	1	0	28
7:15 AM	0	4	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	7	2	0	21
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	7	1	0	15
7:45 AM	0	1	0	0	0	0	0	0	1	0	0	1	10	0	0	0	0	5	2	0	20
8:00 AM	0	2	0	2	0	0	0	0	0	0	0	1	10	0	0	0	0	9	2	0	26
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	1	8	0	0	0	0	3	1	0	15
8:30 AM	0	2	0	1	0	0	0	0	0	0	0	0	7	0	0	0	0	10	1	0	21
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	3	1	0	13
9:00 AM	0	2	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	5	3	0	15
9:15 AM	0	0	0	2	0	0	0	0	0	0	0	1	10	0	0	0	0	5	0	0	18
9:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	2	0	0	13
9:45 AM	0	2	0	2	0	0	0	0	0	0	0	2	10	0	0	0	0	4	2	0	22
10:00 AM	0	3	0	0	0	0	0	0	0	0	0	2	10	0	0	0	0	6	1	0	22
10:15 AM	0	2	0	0	0	0	0	0	0	0	0	2	10	0	0	0	0	5	3	0	22
10:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	12	0	0	0	0	4	1	0	19
10:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	9	0	0	20
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	5	1	0	14
11:15 AM	0	1	0	1	0	0	0	0	0	0	0	1	9	0	0	0	0	6	0	0	18
11:30 AM	0	1	0	1	0	0	0	0	0	0	0	1	15	0	0	0	0	5	0	0	23
11:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	8	1	0	15
12:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	10	3	0	19
12:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	4	0	0	10
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	10	1	0	0	0	11	0	0	23
12:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	9	0	0	0	0	10	1	0	22
1:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	9	0	0	0	0	5	2	0	18
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	0	0	12
1:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0	0	7
1:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	9	0	0	0	0	6	1	0	17
2:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	4	0	0	0	0	13	3	0	22
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	15	1	0	22
2:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	16	3	0	26
2:45 PM	0	4	0	2	0	0	0	0	0	0	0	0	7	0	0	0	0	8	6	0	27
3:00 PM	0	3	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	7	0	0	14
3:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	7	3	0	16
3:30 PM	0	0	0	3	0	0	0	0	0	0	0	2	4	0	0	0	0	7	1	0	17
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	3	0	13
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	1	0	6
4:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	2	0	9
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	2	1	0	6
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	6	2	0	11
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	7	1	0	11
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	4	1	0	9
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	4
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	3
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
7:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
8:00 PM	0	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	5
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	3
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	5
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Counts by Vehicle Type

	Eastbound					Westbound					Northbound					Southbound					
Time	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	U-Turn	Left	Thru	Right	RTOR	Total
Bicycles on Road																					
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bicycles on Crosswalk

Time	Eastbound			Westbound			Northbound			Southbound		
	CCW	CW	Total	CCW	CW	Total	CCW	CW	Total	CCW	CW	Total
6:00 AM	1	0	1	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	1	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	1	1	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	1	1	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrians

	Eastbound			Westbound			Northbound			Southbound		
Time	CCW	CW	Total	CCW	CW	Total	CCW	CW	Total	CCW	CW	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	2	0	2	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	1	1	2	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	1	1	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	1	0	0	0	0	0	0	0	0	0
3:45 PM	1	0	1	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0

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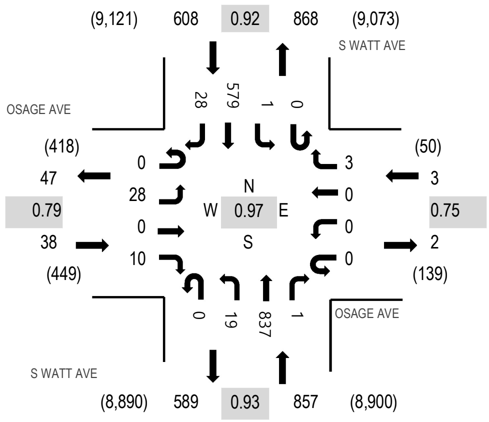
Location: 1 S WATT AVE & OSAGE AVE AM
Date: Wednesday, October 13, 2021
Study Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes in Study Peak Hour: 07:30 AM - 07:45 AM

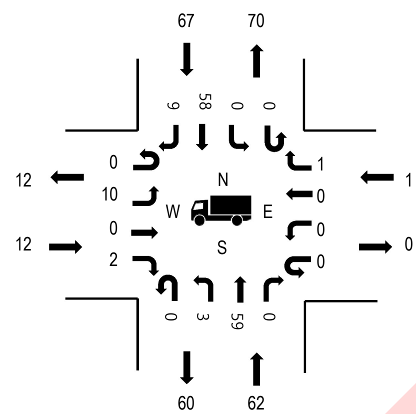
Study Peak Hour (for all study intersections)

Motorized Vehicles

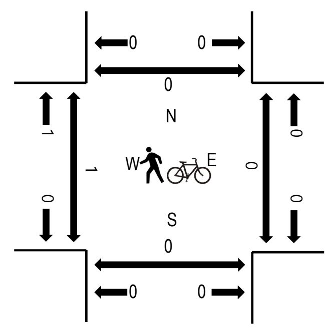


Note: Total study counts contained in parentheses.

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	31.6%	0.79
WB	33.3%	0.75
NB	7.2%	0.93
SB	11.0%	0.92
All	9.4%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	OSAGE AVE Eastbound				OSAGE AVE Westbound				S WATT AVE Northbound				S WATT AVE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
6:00 AM	0	4	3	7	0	0	0	1	0	5	167	0	0	1	96	7	291	1,287
6:15 AM	0	6	0	0	0	1	0	0	0	10	158	1	0	3	115	6	300	1,342
6:30 AM	0	11	0	2	0	2	0	2	0	16	153	0	0	1	109	5	301	1,398
6:45 AM	0	9	0	5	0	0	0	0	0	6	167	0	0	3	191	14	395	1,486
7:00 AM	0	10	2	1	0	0	0	3	0	4	168	0	0	0	147	11	346	1,467
7:15 AM	0	9	0	3	0	0	0	1	0	4	207	0	0	0	127	5	356	1,506
7:30 AM	0	7	0	2	0	0	0	0	0	3	211	0	0	0	158	8	389	1,495
7:45 AM	0	7	0	3	0	0	0	1	0	8	194	0	0	1	152	10	376	1,476
8:00 AM	0	5	0	2	0	0	0	1	0	4	225	1	0	0	142	5	385	1,416
8:15 AM	0	2	1	3	0	0	0	0	0	2	195	0	0	0	136	6	345	1,325
8:30 AM	0	4	0	4	0	0	0	0	0	2	207	0	0	1	146	6	370	1,269
8:45 AM	0	2	0	3	0	1	0	2	0	1	169	1	0	2	129	6	316	1,195
9:00 AM	0	3	0	2	0	0	0	0	0	1	155	0	0	0	123	10	294	1,182
9:15 AM	0	4	0	3	0	0	0	0	0	3	146	0	0	0	124	9	289	1,136
9:30 AM	0	7	0	4	0	0	0	0	0	1	158	0	0	1	112	13	296	1,122
9:45 AM	0	5	0	4	0	0	0	1	0	5	141	1	0	0	139	7	303	1,092
10:00 AM	0	11	0	0	0	0	0	0	0	4	118	0	0	1	110	4	248	1,041
10:15 AM	0	6	0	2	0	0	0	0	0	2	134	0	0	0	125	6	275	1,055
10:30 AM	0	4	0	1	0	0	0	0	0	1	134	0	0	0	122	4	266	1,025
10:45 AM	0	11	0	1	0	1	0	0	0	3	117	0	0	2	115	2	252	1,044
11:00 AM	0	0	0	6	0	0	0	1	0	3	127	0	0	2	119	4	262	1,074
11:15 AM	0	6	0	3	0	0	0	1	0	3	111	0	0	0	116	5	245	1,103
11:30 AM	0	3	0	3	0	0	0	0	0	2	131	0	0	2	140	4	285	1,127
11:45 AM	0	2	0	5	0	1	0	0	0	0	123	0	0	0	144	7	282	1,171
12:00 PM	0	5	1	3	0	0	0	0	0	2	119	0	0	2	150	9	291	1,178
12:15 PM	0	7	0	3	0	0	0	0	0	2	136	0	0	0	114	7	269	1,169
12:30 PM	0	4	0	3	0	0	0	0	0	1	165	3	0	2	147	4	329	1,206

12:45 PM	0	4	0	2	0	1	0	0	0	0	132	0	0	1	144	5	289	1,167
1:00 PM	0	3	0	3	0	0	0	1	0	2	112	0	0	0	156	5	282	1,251
1:15 PM	0	3	0	2	0	0	0	2	0	1	144	0	0	1	151	2	306	1,319
1:30 PM	0	5	0	1	0	0	0	0	0	0	123	0	0	0	155	6	290	1,366
1:45 PM	0	2	0	7	0	0	0	0	0	1	159	0	1	2	196	5	373	1,444
2:00 PM	0	5	0	8	0	0	0	0	0	5	158	0	0	1	165	8	350	1,407
2:15 PM	0	2	0	2	0	0	0	0	0	0	159	0	0	3	185	2	353	1,394
2:30 PM	0	6	0	0	0	1	0	1	0	2	176	2	0	3	171	6	368	1,364
2:45 PM	0	15	1	6	0	0	0	2	0	0	151	0	0	6	140	15	336	1,370
3:00 PM	0	6	2	10	0	1	0	0	0	1	140	0	0	2	172	3	337	1,371
3:15 PM	0	4	1	2	0	0	0	0	0	0	153	0	0	2	155	6	323	1,384
3:30 PM	0	6	0	7	0	0	0	0	0	3	183	0	0	3	165	7	374	1,394
3:45 PM	0	3	0	5	0	0	0	0	0	0	164	1	0	7	150	7	337	1,399
4:00 PM	0	5	1	4	0	0	0	1	0	0	158	0	1	5	172	3	350	1,381
4:15 PM	0	8	1	0	0	0	0	1	0	0	155	0	0	5	157	6	333	1,427
4:30 PM	0	7	0	3	0	0	0	1	0	0	182	0	0	6	177	3	379	1,461
4:45 PM	0	5	0	3	0	0	0	2	0	1	155	0	0	2	147	4	319	1,415
5:00 PM	0	13	2	3	0	0	0	1	0	1	177	0	0	10	189	0	396	1,414
5:15 PM	0	3	1	1	0	0	0	1	0	1	168	0	1	4	184	3	367	1,306
5:30 PM	0	2	0	2	0	0	0	1	0	0	157	0	0	2	166	3	333	1,232
5:45 PM	0	0	0	4	0	0	0	0	0	0	136	0	0	5	170	3	318	1,167
6:00 PM	0	2	0	1	0	0	0	2	0	0	131	2	0	1	147	2	288	1,124
6:15 PM	0	0	0	2	0	0	0	1	0	2	114	0	0	2	171	1	293	1,084
6:30 PM	0	1	0	0	0	1	0	1	0	0	114	1	0	2	148	0	268	970
6:45 PM	0	1	0	1	0	1	0	1	0	0	115	3	0	0	150	3	275	871
7:00 PM	0	0	0	2	0	1	0	0	0	0	92	1	0	2	150	0	248	782
7:15 PM	0	0	0	0	0	0	0	2	0	0	65	0	0	0	112	0	179	718
7:30 PM	0	0	0	0	0	0	0	2	0	0	71	1	0	0	94	1	169	709
7:45 PM	0	1	0	0	0	0	0	0	0	2	67	0	0	0	112	4	186	708
8:00 PM	0	2	0	3	0	0	0	0	0	0	83	0	0	1	95	0	184	659
8:15 PM	0	1	0	0	0	0	0	0	0	0	74	0	0	0	95	0	170	605
8:30 PM	0	1	0	0	0	0	0	0	0	0	68	0	0	0	99	0	168	554
8:45 PM	0	0	0	0	0	0	0	1	0	0	71	0	0	0	65	0	137	515
9:00 PM	0	0	0	0	0	0	0	0	0	0	64	0	0	0	66	0	130	486
9:15 PM	0	0	0	0	0	0	0	0	0	0	45	0	0	1	73	0	119	
9:30 PM	0	1	0	0	0	0	0	0	0	1	63	0	0	0	64	0	129	
9:45 PM	0	0	0	0	0	0	0	0	0	0	46	0	0	2	60	0	108	
Count Total	0	271	16	162	0	12	0	38	0	121	8,761	18	3	105	8,716	297	18,520	
Peak Hour	0	28	0	10	0	0	0	3	0	19	837	1	0	1	579	28	1,506	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
6:00 AM	11	22	0	11	44	6:00 AM	0	0	0	0	0	6:00 AM	1	0	0	0	1
6:15 AM	6	23	0	10	39	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:30 AM	7	16	0	12	35	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:45 AM	6	19	0	12	37	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
7:00 AM	9	21	0	13	43	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:15 AM	6	16	0	15	37	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:30 AM	1	12	0	16	29	7:30 AM	0	0	0	1	1	7:30 AM	1	0	0	0	1
7:45 AM	1	17	1	12	31	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	4	17	0	24	45	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:15 AM	2	19	0	10	31	8:15 AM	0	0	0	0	0	8:15 AM	1	0	0	0	1
8:30 AM	5	12	0	21	38	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:45 AM	0	14	0	17	31	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
9:00 AM	4	10	0	20	34	9:00 AM	0	0	0	1	1	9:00 AM	0	0	0	0	0
9:15 AM	2	16	0	16	34	9:15 AM	0	0	0	0	0	9:15 AM	0	0	0	0	0
9:30 AM	1	24	0	12	37	9:30 AM	0	0	0	0	0	9:30 AM	0	0	0	0	0
9:45 AM	5	18	0	24	47	9:45 AM	0	0	0	0	0	9:45 AM	0	0	0	0	0
10:00 AM	4	16	0	21	41	10:00 AM	0	0	0	0	0	10:00 AM	2	0	0	0	2
10:15 AM	2	21	0	22	45	10:15 AM	0	0	0	0	0	10:15 AM	0	0	0	0	0

10:30 AM	2	20	0	17	39	10:30 AM	0	0	0	1	1	10:30 AM	0	0	0	0	0
10:45 AM	3	15	0	18	36	10:45 AM	0	0	0	0	0	10:45 AM	0	0	0	0	0
11:00 AM	0	14	0	14	28	11:00 AM	0	0	0	0	0	11:00 AM	0	0	0	0	0
11:15 AM	3	12	0	13	28	11:15 AM	0	0	0	0	0	11:15 AM	0	0	0	0	0
11:30 AM	2	20	0	11	33	11:30 AM	0	0	0	0	0	11:30 AM	0	0	0	0	0
11:45 AM	1	9	0	21	31	11:45 AM	0	0	0	0	0	11:45 AM	0	0	0	0	0
12:00 PM	2	8	0	23	33	12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0
12:15 PM	1	12	0	14	27	12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0
12:30 PM	1	16	0	15	32	12:30 PM	0	0	0	0	0	12:30 PM	2	0	0	0	2
12:45 PM	2	14	0	22	38	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
1:00 PM	3	10	0	19	32	1:00 PM	0	0	0	0	0	1:00 PM	0	0	0	0	0
1:15 PM	0	12	0	18	30	1:15 PM	0	1	0	0	1	1:15 PM	0	0	0	0	0
1:30 PM	3	5	0	19	27	1:30 PM	0	0	0	0	0	1:30 PM	1	0	0	0	1
1:45 PM	3	12	0	18	33	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
2:00 PM	3	10	0	24	37	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:15 PM	0	10	0	24	34	2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0
2:30 PM	1	7	0	26	34	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:45 PM	8	8	0	22	38	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
3:00 PM	5	6	0	17	28	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:15 PM	2	8	0	19	29	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:30 PM	3	7	0	15	25	3:30 PM	0	0	0	0	0	3:30 PM	1	0	0	0	1
3:45 PM	1	7	0	13	21	3:45 PM	0	0	0	0	0	3:45 PM	2	0	0	0	2
4:00 PM	0	5	0	14	19	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	2	4	0	9	15	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	1	2	0	7	10	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	0	1
4:45 PM	2	1	0	11	14	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	6	7	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	8	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	4	0	9	13	5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0
5:45 PM	1	4	0	8	13	5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0
6:00 PM	1	3	0	5	9	6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0
6:15 PM	1	1	0	6	8	6:15 PM	0	1	0	0	1	6:15 PM	0	0	0	0	0
6:30 PM	0	1	0	2	3	6:30 PM	0	0	0	0	0	6:30 PM	0	0	0	0	0
6:45 PM	0	0	0	9	9	6:45 PM	0	0	0	0	0	6:45 PM	0	0	0	0	0
7:00 PM	2	0	0	4	6	7:00 PM	0	0	0	0	0	7:00 PM	0	0	0	0	0
7:15 PM	0	1	0	1	2	7:15 PM	0	0	0	0	0	7:15 PM	0	0	0	0	0
7:30 PM	0	0	0	6	6	7:30 PM	0	0	0	0	0	7:30 PM	1	0	0	0	1
7:45 PM	0	4	0	1	5	7:45 PM	0	0	0	0	0	7:45 PM	0	0	0	0	0
8:00 PM	3	2	0	2	7	8:00 PM	0	1	0	0	1	8:00 PM	0	0	0	0	0
8:15 PM	0	1	0	3	4	8:15 PM	0	0	0	0	0	8:15 PM	0	0	0	0	0
8:30 PM	0	4	0	2	6	8:30 PM	0	0	0	0	0	8:30 PM	0	0	0	0	0
8:45 PM	0	0	0	0	0	8:45 PM	0	0	0	0	0	8:45 PM	0	0	0	0	0
9:00 PM	0	1	0	0	1	9:00 PM	0	0	0	0	0	9:00 PM	0	0	0	0	0
9:15 PM	0	1	0	1	2	9:15 PM	0	0	0	0	0	9:15 PM	0	0	0	0	0
9:30 PM	0	1	0	0	1	9:30 PM	0	0	0	0	0	9:30 PM	0	0	0	0	0
9:45 PM	0	0	0	0	0	9:45 PM	0	0	0	0	0	9:45 PM	0	0	0	0	0
Count Total	138	596	1	804	1,539	Count Total	0	5	0	3	8	Count Total	13	0	0	0	13
Peak Hour	12	62	1	67	142	Peak Hour	0	0	0	1	1	Peak Hour	1	0	0	0	1

All Traffic Data Services, LLC

www.alltrafficdata.net

Site Code: 2
Station ID:
S WATT AVE S.O OSAGE AVE

Start Time	13-Oct-21 NB	13-Oct-21 SB	14-Oct-21 NB	14-Oct-21 SB	15-Oct-21 NB	15-Oct-21 SB	16-Oct-21 NB	16-Oct-21 SB	17-Oct-21 NB	17-Oct-21 SB	18-Oct-21 NB	18-Oct-21 SB	19-Oct-21 NB	19-Oct-21 SB	Week Average NB	Week Average SB
12:00 AM	71	69	*	*	*	*	*	*	*	*	*	*	*	*	71	69
01:00	42	54	*	*	*	*	*	*	*	*	*	*	*	*	42	54
02:00	79	116	*	*	*	*	*	*	*	*	*	*	*	*	79	116
03:00	137	238	*	*	*	*	*	*	*	*	*	*	*	*	137	238
04:00	313	401	*	*	*	*	*	*	*	*	*	*	*	*	313	401
05:00	644	467	*	*	*	*	*	*	*	*	*	*	*	*	644	467
06:00	725	541	*	*	*	*	*	*	*	*	*	*	*	*	725	541
07:00	**764**	539	*	*	*	*	*	*	*	*	*	*	*	*	**764**	539
08:00	644	487	*	*	*	*	*	*	*	*	*	*	*	*	644	487
09:00	463	448	*	*	*	*	*	*	*	*	*	*	*	*	463	448
10:00	516	529	*	*	*	*	*	*	*	*	*	*	*	*	516	529
11:00	555	**565**	*	*	*	*	*	*	*	*	*	*	*	*	555	**565**
12:00 PM	529	622	*	*	*	*	*	*	*	*	*	*	*	*	529	622
01:00	561	622	*	*	*	*	*	*	*	*	*	*	*	*	561	622
02:00	631	659	*	*	*	*	*	*	*	*	*	*	*	*	631	659
03:00	**632**	657	*	*	*	*	*	*	*	*	*	*	*	*	**632**	657
04:00	632	**684**	*	*	*	*	*	*	*	*	*	*	*	*	632	**684**
05:00	478	633	*	*	*	*	*	*	*	*	*	*	*	*	478	633
06:00	306	484	*	*	*	*	*	*	*	*	*	*	*	*	306	484
07:00	307	377	*	*	*	*	*	*	*	*	*	*	*	*	307	377
08:00	228	264	*	*	*	*	*	*	*	*	*	*	*	*	228	264
09:00	194	224	*	*	*	*	*	*	*	*	*	*	*	*	194	224
10:00	126	136	*	*	*	*	*	*	*	*	*	*	*	*	126	136
11:00	60	71	*	*	*	*	*	*	*	*	*	*	*	*	60	71
Total	9637	9887	0	0	0	0	0	0	0	0	0	0	0	0	9637	9887
Day	19524		0		0		0		0		0		0		19524	
AM Peak	07:00	11:00	-	-	-	-	-	-	-	-	-	-	-	-	07:00	11:00
Vol.	764	565	-	-	-	-	-	-	-	-	-	-	-	-	764	565
PM Peak	15:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	15:00	16:00
Vol.	632	684	-	-	-	-	-	-	-	-	-	-	-	-	632	684

	13-Oct-21	14-Oct-21	15-Oct-21	16-Oct-21	17-Oct-21	18-Oct-21	19-Oct-21	Week Average
Comb. Total	19524	0	0	0	0	0	0	19524

ADT   ADT 19,524   AADT 19,524

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ADJUSTMENT OF YEAR 2021 TRAFFIC COUNTS

Traffic Counts - All Vehicles

2021 All Vehicles

	OSAGE AVE			OSAGE AVE			S WATT AVE			S WATT AVE		
	Eastbound			Westbound			Northbound			Southbound		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	3	7	0	0	1	5	167	0	1	96	7
6:15 AM	6	0	0	1	0	0	10	158	1	3	115	6
6:30 AM	11	0	2	2	0	2	16	153	0	1	109	5
6:45 AM	9	0	5	0	0	0	6	167	0	3	191	14
7:00 AM	10	2	1	0	0	3	4	168	0	0	147	11
7:15 AM	9	0	3	0	0	1	4	207	0	0	127	5
7:30 AM	7	0	2	0	0	0	3	211	0	0	158	8
7:45 AM	7	0	3	0	0	1	8	194	0	1	152	10
8:00 AM	5	0	2	0	0	1	4	225	1	0	142	5
8:15 AM	2	1	3	0	0	0	2	195	0	0	136	6
8:30 AM	4	0	4	0	0	0	2	207	0	1	146	6
8:45 AM	2	0	3	1	0	2	1	169	1	2	129	6
9:00 AM	3	0	2	0	0	0	1	155	0	0	123	10
9:15 AM	4	0	3	0	0	0	3	146	0	0	124	9
9:30 AM	7	0	4	0	0	0	1	158	0	1	112	13
9:45 AM	5	0	4	0	0	1	5	141	1	0	139	7
10:00 AM	11	0	0	0	0	0	4	118	0	1	110	4
10:15 AM	6	0	2	0	0	0	2	134	0	0	125	6
10:30 AM	4	0	1	0	0	0	1	134	0	0	122	4
10:45 AM	11	0	1	1	0	0	3	117	0	2	115	2
11:00 AM	0	0	6	0	0	1	3	127	0	2	119	4
11:15 AM	6	0	3	0	0	1	3	111	0	0	116	5
11:30 AM	3	0	3	0	0	0	2	131	0	2	140	4
11:45 AM	2	0	5	1	0	0	0	123	0	0	144	7
12:00 PM	5	1	3	0	0	0	2	119	0	2	150	9
12:15 PM	7	0	3	0	0	0	2	136	0	0	114	7
12:30 PM	4	0	3	0	0	0	1	165	3	2	147	4
12:45 PM	4	0	2	1	0	0	0	132	0	1	144	5
1:00 PM	3	0	3	0	0	1	2	112	0	0	156	5
1:15 PM	3	0	2	0	0	2	1	144	0	1	151	2
1:30 PM	5	0	1	0	0	0	0	123	0	0	155	6
1:45 PM	2	0	7	0	0	0	1	159	0	3	196	5
2:00 PM	5	0	8	0	0	0	5	158	0	1	165	8
2:15 PM	2	0	2	0	0	0	0	159	0	3	185	2
2:30 PM	6	0	0	1	0	1	2	176	2	3	171	6
2:45 PM	15	1	6	0	0	2	0	151	0	6	140	15
3:00 PM	6	2	10	1	0	0	1	140	0	2	172	3
3:15 PM	4	1	2	0	0	0	0	153	0	2	155	6
3:30 PM	6	0	7	0	0	0	3	183	0	3	165	7
3:45 PM	3	0	5	0	0	0	0	164	1	7	150	7
4:00 PM	5	1	4	0	0	1	0	158	0	6	172	3
4:15 PM	8	1	0	0	0	1	0	155	0	5	157	6
4:30 PM	7	0	3	0	0	1	0	182	0	6	177	3
4:45 PM	5	0	3	0	0	2	1	155	0	2	147	4
5:00 PM	13	2	3	0	0	1	1	177	0	10	189	0
5:15 PM	3	1	1	0	0	1	1	168	0	5	184	3
5:30 PM	2	0	2	0	0	1	0	157	0	2	166	3
5:45 PM	0	0	4	0	0	0	0	136	0	5	170	3
6:00 PM	2	0	1	0	0	2	0	131	2	1	147	2
6:15 PM	0	0	2	0	0	1	2	114	0	2	171	1
6:30 PM	1	0	0	1	0	1	0	114	1	2	148	0
6:45 PM	1	0	1	1	0	1	0	115	3	0	150	3
7:00 PM	0	0	2	1	0	0	0	92	1	2	150	0
7:15 PM	0	0	0	0	0	2	0	65	0	0	112	0
7:30 PM	0	0	0	0	0	2	0	71	1	0	94	1
7:45 PM	1	0	0	0	0	0	2	67	0	0	112	4
8:00 PM	2	0	3	0	0	0	0	83	0	1	95	0
8:15 PM	1	0	0	0	0	0	0	74	0	0	95	0
8:30 PM	1	0	0	0	0	0	0	68	0	0	99	0
8:45 PM	0	0	0	0	0	1	0	71	0	0	65	0
9:00 PM	0	0	0	0	0	0	0	64	0	0	66	0
9:15 PM	0	0	0	0	0	0	0	45	0	1	73	0
9:30 PM	1	0	0	0	0	0	1	63	0	0	64	0
9:45 PM	0	0	0	0	0	0	0	46	0	2	60	0

Adjustments

OSAGE AVE			OSAGE AVE			S WATT AVE			S WATT AVE			
Eastbound			Westbound			Northbound			Southbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Time
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	6:00 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	6:15 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	6:30 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	6:45 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	7:00 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	7:15 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	7:30 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	7:45 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	8:00 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	8:15 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	8:30 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	8:45 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	9:00 AM
1.14	1.15	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.16	1.16	1.16	9:15 AM
1.13	1.14	1.16	1.16	1.14	1.13	1.13	1.13	1.13	1.16	1.16	1.16	9:30 AM
1.13	1.14	1.16	1.16	1.14	1.13	1.13	1.13	1.13	1.16	1.16	1.16	9:45 AM
1.12	1.14	1.16	1.16	1.14	1.12	1.12	1.12	1.12	1.16	1.16	1.16	10:00 AM
1.12	1.14	1.15	1.15	1.14	1.12	1.12	1.12	1.12	1.15	1.15	1.15	10:15 AM
1.11	1.13	1.15	1.15	1.13	1.11	1.11	1.11	1.11	1.15	1.15	1.15	10:30 AM
1.11	1.13	1.15	1.15	1.13	1.11	1.11	1.11	1.11	1.15	1.15	1.15	10:45 AM
1.10	1.13	1.15	1.15	1.13	1.10	1.10	1.10	1.10	1.15	1.15	1.15	11:00 AM
1.10	1.12	1.15	1.15	1.12	1.10	1.10	1.10	1.10	1.15	1.15	1.15	11:15 AM
1.09	1.12	1.15	1.15	1.12	1.09	1.09	1.09	1.09	1.15	1.15	1.15	11:30 AM
1.09	1.12	1.15	1.15	1.12	1.09	1.09	1.09	1.09	1.15	1.15	1.15	11:45 AM
1.08	1.12	1.15	1.15	1.12	1.08	1.08	1.08	1.08	1.15	1.15	1.15	12:00 PM
1.08	1.11	1.15	1.15	1.11	1.08	1.08	1.08	1.08	1.15	1.15	1.15	12:15 PM
1.08	1.11	1.15	1.15	1.11	1.08	1.08	1.08	1.08	1.15	1.15	1.15	12:30 PM
1.07	1.11	1.14	1.14	1.11	1.07	1.07	1.07	1.07	1.14	1.14	1.14	12:45 PM
1.07	1.10	1.14	1.14	1.10	1.07	1.07	1.07	1.07	1.14	1.14	1.14	1:00 PM
1.06	1.10	1.14	1.14	1.10	1.06	1.06	1.06	1.06	1.14	1.14	1.14	1:15 PM
1.06	1.10	1.14	1.14	1.10	1.06	1.06	1.06	1.06	1.14	1.14	1.14	1:30 PM
1.05	1.10	1.14	1.14	1.10	1.05	1.05	1.05	1.05	1.14	1.14	1.14	1:45 PM
1.05	1.09	1.14	1.14	1.09	1.05	1.05	1.05	1.05	1.14	1.14	1.14	2:00 PM
1.04	1.09	1.14	1.14	1.09	1.04	1.04	1.04	1.04	1.14	1.14	1.14	2:15 PM
1.04	1.09	1.14	1.14	1.09	1.04	1.04	1.04	1.04	1.14	1.14	1.14	2:30 PM
1.03	1.08	1.14	1.14	1.08	1.03	1.03	1.03	1.03	1.14	1.14	1.14	2:45 PM
1.03	1.08	1.13	1.13	1.08	1.03	1.03	1.03	1.03	1.13	1.13	1.13	3:00 PM
1.02	1.08	1.13	1.13	1.08	1.02	1.02	1.02	1.02	1.13	1.13	1.13	3:15 PM
1.02	1.08	1.13	1.13	1.08	1.02	1.02	1.02	1.02	1.13	1.13	1.13	3:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	3:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	4:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	4:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	4:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	4:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	5:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	5:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	5:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	5:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	6:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	6:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	6:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	6:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	7:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	7:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	7:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	7:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	8:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	8:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	8:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	8:45 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	9:00 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	9:15 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	9:30 PM
1.01	1.07	1.13	1.13	1.07	1.01	1.01	1.01	1.01	1.13	1.13	1.13	9:45 PM

Adjusted Volumes - All Vehicles

	OSAGE AVE			OSAGE AVE			S WATT AVE			S WATT AVE		
	Eastbound			Westbound			Northbound			Southbound		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	5	3	8	0	0	1	6	190	0	1	111	8
6:15 AM	7	0	0	1	0	0	11	180	1	3	133	7
6:30 AM	13	0	2	2	0	2	18	174	0	1	126	6
6:45 AM	10	0	6	0	0	0	7	190	0	3	222	16
7:00 AM	11	2	1	0	0	3	5	192	0	0	171	13
7:15 AM	10	0	3	0	0	1	5	236	0	0	147	6
7:30 AM	8	0	2	0	0	0	3	241	0	0	183	9
7:45 AM	8	0	3	0	0	1	9	221	0	1	176	12
8:00 AM	6	0	2	0	0	1	5	257	1	0	165	6
8:15 AM	2	1	3	0	0	0	2	222	0	0	158	7
8:30 AM	5	0	5	0	0	0	2	236	0	1	169	7
8:45 AM	2	0	3	1	0	2	1	193	1	2	150	7
9:00 AM	3	0	2	0	0	0	1	177	0	0	143	12
9:15 AM	5	0	3	0	0	0	3	166	0	0	144	10
9:30 AM	8	0	5	0	0	0	1	179	0	1	130	15
9:45 AM	6	0	5	0	0	1	6	159	1	0	161	8
10:00 AM	12	0	0	0	0	0	4	132	0	1	127	5
10:15 AM	7	0	2	0	0	0	2	150	0	0	144	7
10:30 AM	4	0	1	0	0	0	1	149	0	0	141	5
10:45 AM	12	0	1	1	0	0	3	130	0	2	133	2
11:00 AM	0	0	7	0	0	1	3	140	0	2	137	5
11:15 AM	7	0	3	0	0	1	3	122	0	0	133	6
11:30 AM	3	0	3	0	0	0	2	143	0	2	161	5
11:45 AM	2	0	6	1	0	0	0	134	0	0	165	8
12:00 PM	5	1	3	0	0	0	2	129	0	2	172	10
12:15 PM	8	0	3	0	0	0	2	147	0	0	131	8
12:30 PM	4	0	3	0	0	0	1	177	3	2	168	5
12:45 PM	4	0	2	1	0	0	0	141	0	1	165	6
1:00 PM	3	0	3	0	0	1	2	119	0	0	178	6
1:15 PM	3	0	2	0	0	2	1	153	0	1	172	2
1:30 PM	5	0	1	0	0	0	0	130	0	0	177	7
1:45 PM	2	0	8	0	0	0	1	167	0	3	223	6
2:00 PM	5	0	9	0	0	0	5	165	0	1	188	9
2:15 PM	2	0	2	0	0	0	0	166	0	3	210	2
2:30 PM	6	0	0	1	0	1	2	183	2	3	194	7
2:45 PM	15	1	7	0	0	2	0	156	0	7	159	17
3:00 PM	6	2	11	1	0	0	1	144	0	2	195	3
3:15 PM	4	1	2	0	0	0	0	157	0	2	176	7
3:30 PM	6	0	8	0	0	0	3	187	0	3	187	8
3:45 PM	3	0	6	0	0	0	0	166	1	8	170	8
4:00 PM	5	1	5	0	0	1	0	160	0	7	194	3
4:15 PM	8	1	0	0	0	1	0	157	0	6	177	7
4:30 PM	7	0	3	0	0	1	0	184	0	7	200	3
4:45 PM	5	0	3	0	0	2	1	157	0	2	166	5
5:00 PM	13	2	3	0	0	1	1	179	0	11	214	0
5:15 PM	3	1	1	0	0	1	1	170	0	6	208	3
5:30 PM	2	0	2	0	0	1	0	159	0	2	188	3
5:45 PM	0	0	5	0	0	0	0	137	0	6	192	3
6:00 PM	2	0	1	0	0	2	0	132	2	1	166	2
6:15 PM	0	0	2	0	0	1	2	115	0	2	193	1
6:30 PM	1	0	0	1	0	1	0	115	1	2	167	0
6:45 PM	1	0	1	1	0	1	0	116	3	0	170	3
7:00 PM	0	0	2	1	0	0	0	93	1	2	170	0
7:15 PM	0	0	0	0	0	2	0	66	0	0	127	0
7:30 PM	0	0	0	0	0	2	0	72	1	0	106	1
7:45 PM	1	0	0	0	0	0	2	68	0	0	127	5
8:00 PM	2	0	3	0	0	0	0	84	0	1	107	0
8:15 PM	1	0	0	0	0	0	0	75	0	0	107	0
8:30 PM	1	0	0	0	0	0	0	69	0	0	112	0
8:45 PM	0	0	0	0	0	1	0	72	0	0	73	0
9:00 PM	0	0	0	0	0	0	0	65	0	0	75	0
9:15 PM	0	0	0	0	0	0	0	45	0	1	82	0
9:30 PM	1	0	0	0	0	0	1	64	0	0	72	0
9:45 PM	0	0	0	0	0	0	0	46	0	2	68	0

SPEED DATA - 2021

All Traffic Data Services, LLC

www.alltrafficdata.net

Site Code: 2
Station ID:
S WATT AVE S.O OSAGE AVE

NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
10/13/21	2	1	0	1	0	1	3	9	26	17	8	2	0	1	71	51-60	43
01:00	2	0	0	0	0	1	4	3	7	12	10	1	**2**	0	42	56-65	22
02:00	7	0	0	0	0	0	2	14	16	18	12	**9**	1	0	79	51-60	34
03:00	6	1	0	0	0	3	10	15	33	37	**26**	4	0	**2**	137	51-60	70
04:00	26	1	1	**8**	4	8	27	80	92	47	14	4	1	0	313	46-55	172
05:00	77	**3**	**4**	4	3	53	133	204	119	35	7	1	0	1	644	41-50	337
06:00	**94**	1	0	4	9	57	165	220	**145**	19	6	3	0	2	725	41-50	385
07:00	80	2	0	3	**16**	**65**	**174**	**261**	135	21	6	1	0	0	**764**	41-50	435
08:00	60	3	1	4	6	47	105	229	133	45	9	0	0	2	644	46-55	362
09:00	53	1	1	4	5	31	58	126	117	**57**	9	1	0	0	463	46-55	243
10:00	45	1	2	0	4	31	72	170	120	49	17	4	1	0	516	46-55	290
11:00	34	1	1	5	1	31	103	185	121	56	10	6	0	1	555	46-55	306
12 PM	50	**5**	5	3	8	20	106	144	113	58	13	3	0	1	529	46-55	257
13:00	**67**	0	**7**	4	**23**	**75**	129	119	97	37	2	1	0	0	561	41-50	248
14:00	50	0	2	5	10	48	**131**	188	142	46	4	3	1	1	631	46-55	330
15:00	54	2	3	**10**	21	23	95	**196**	129	59	26	**10**	3	1	**632**	46-55	325
16:00	40	2	0	1	5	42	79	187	**177**	**81**	11	4	2	1	632	46-55	364
17:00	26	0	2	0	2	10	52	153	151	54	18	8	1	1	478	46-55	304
18:00	5	0	0	2	0	10	30	77	101	55	21	4	0	1	306	46-55	178
19:00	12	1	1	1	0	7	17	65	116	60	18	5	**4**	0	307	46-55	181
20:00	7	1	0	2	0	0	10	32	81	65	21	6	1	**2**	228	51-60	146
21:00	7	0	0	0	0	2	6	27	69	49	**27**	7	0	0	194	51-60	118
22:00	4	1	1	0	0	0	7	14	39	38	14	6	1	1	126	51-60	77
23:00	1	0	0	0	0	0	1	6	14	20	10	5	2	1	60	51-60	34
Total	809	27	31	61	117	565	1519	2724	2293	1035	319	98	20	19	9637		
Percent	8.4%	0.3%	0.3%	0.6%	1.2%	5.9%	15.8%	28.3%	23.8%	10.7%	3.3%	1.0%	0.2%	0.2%			
AM Peak	06:00	05:00	05:00	04:00	07:00	07:00	07:00	07:00	06:00	09:00	03:00	02:00	01:00	03:00	07:00		
Vol.	94	3	4	8	16	65	174	261	145	57	26	9	2	2	764		
PM Peak	13:00	12:00	13:00	15:00	13:00	13:00	14:00	15:00	16:00	16:00	21:00	15:00	19:00	20:00	15:00		
Vol.	67	5	7	10	23	75	131	196	177	81	27	10	4	2	632		
Total	809	27	31	61	117	565	1519	2724	2293	1035	319	98	20	19	9637		
Percent	8.4%	0.3%	0.3%	0.6%	1.2%	5.9%	15.8%	28.3%	23.8%	10.7%	3.3%	1.0%	0.2%	0.2%			

	15th Percentile :	38 MPH
	50th Percentile :	48 MPH
	85th Percentile :	55 MPH
	95th Percentile :	59 MPH
Stats	10 MPH Pace Speed :	46-55 MPH
	Number in Pace :	5017
	Percent in Pace :	52.1%
	Number of Vehicles > 55 MPH :	1491
	Percent of Vehicles > 55 MPH :	15.5%
	Mean Speed(Average) :	46 MPH

All Traffic Data Services, LLC
www.alltrafficdata.net

Site Code: 2
Station ID:
S WATT AVE S.O OSAGE AVE

SB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
10/13/21	2	0	0	0	0	0	4	8	8	24	9	7	5	2	69	54-63	33
01:00	1	0	0	0	0	0	2	3	6	11	17	8	0	6	54	56-65	28
02:00	8	0	0	0	1	6	9	15	9	14	23	12	11	**8**	116	56-65	37
03:00	13	0	0	0	0	0	3	14	50	62	47	**29**	13	7	238	51-60	112
04:00	25	1	0	4	15	36	49	57	57	63	**51**	22	**14**	7	401	51-60	120
05:00	66	2	1	0	7	43	48	74	102	58	46	10	4	6	467	46-55	176
06:00	**89**	3	0	6	11	42	**95**	**104**	87	61	32	7	1	3	541	41-50	199
07:00	85	1	0	1	14	**51**	91	82	105	73	24	9	1	2	539	46-55	187
08:00	57	1	4	2	6	22	71	100	102	69	37	8	6	2	487	46-55	202
09:00	31	1	1	0	10	20	93	96	105	57	23	9	1	1	448	46-55	201
10:00	38	0	0	1	3	37	72	94	114	**104**	47	12	7	0	529	51-60	218
11:00	64	**8**	**11**	**21**	**18**	34	72	88	**118**	80	36	11	2	2	**565**	46-55	206
12 PM	59	1	3	3	25	96	110	143	99	49	21	11	2	0	622	41-50	253
13:00	**120**	**21**	**19**	**29**	29	67	121	96	65	36	14	4	0	1	622	41-50	217
14:00	83	4	3	10	**52**	98	137	106	77	47	24	10	6	2	659	41-50	243
15:00	65	1	8	12	48	**107**	126	105	86	54	26	10	5	4	657	36-45	233
16:00	50	3	12	12	16	84	**139**	128	107	82	33	10	3	5	**684**	41-50	267
17:00	37	0	1	3	20	44	109	**144**	**117**	**98**	42	12	3	3	633	46-55	261
18:00	18	0	1	2	4	27	100	102	88	74	38	16	**10**	4	484	41-50	202
19:00	17	0	0	3	0	5	29	65	90	88	**58**	17	3	2	377	51-60	178
20:00	3	0	1	0	1	3	14	42	71	52	42	**20**	10	5	264	51-60	123
21:00	6	0	0	0	1	1	1	28	63	59	36	17	5	7	224	51-60	122
22:00	2	0	0	1	0	0	2	15	27	37	26	12	6	**8**	136	51-60	64
23:00	0	0	0	0	1	0	1	10	16	19	17	1	4	2	71	54-63	36
Total	939	47	65	110	282	823	1498	1719	1769	1371	769	284	122	89	9887		
Percent	9.5%	0.5%	0.7%	1.1%	2.9%	8.3%	15.2%	17.4%	17.9%	13.9%	7.8%	2.9%	1.2%	0.9%			
AM Peak	06:00	11:00	11:00	11:00	11:00	07:00	06:00	06:00	11:00	10:00	04:00	03:00	04:00	02:00	11:00		
Vol.	89	8	11	21	18	51	95	104	118	104	51	29	14	8	565		
PM Peak	13:00	13:00	13:00	13:00	14:00	15:00	16:00	17:00	17:00	17:00	19:00	20:00	18:00	22:00	16:00		
Vol.	120	21	19	29	52	107	139	144	117	98	58	20	10	8	684		
Total	939	47	65	110	282	823	1498	1719	1769	1371	769	284	122	89	9887		
Percent	9.5%	0.5%	0.7%	1.1%	2.9%	8.3%	15.2%	17.4%	17.9%	13.9%	7.8%	2.9%	1.2%	0.9%			

	15th Percentile :	35 MPH
	50th Percentile :	48 MPH
	85th Percentile :	58 MPH
	95th Percentile :	64 MPH
Stats	10 MPH Pace Speed :	46-55 MPH
	Number in Pace :	3488
	Percent in Pace :	35.3%
	Number of Vehicles > 55 MPH :	2635
	Percent of Vehicles > 55 MPH :	26.7%
	Mean Speed(Average) :	46 MPH

TRIP GENERATION AND TRIP DISTRIBUTION MEMORANDUM

TRIP GENERATION AND DISTRIBUTION

DATE: October 24, 2021

TO: Matthew Ilagan | City of Sacramento

FROM: Vic Maslanka, Josh Pilachowski | DKS Associates

SUBJECT: 8981 Osage Avenue Warehouse Project # 19179-015

INTRODUCTION

This memorandum summarizes the results of the vehicular trip generation analysis of the proposed development at 8981 Osage Avenue in the City of Sacramento.

PROJECT DESCRIPTION

The 9.51-acre project site is located at 8981 Osage Avenue, in the northeast quadrant of the intersection of Osage Avenue and South Watt Avenue. The site is currently vacant. The project proposes a warehouse of 136,720 square feet.

The project site is located within a heavy industrial M-2(S)-R zone.

TRIP GENERATION ESTIMATION

Vehicular trip generation estimates of the project are based upon information published by the Institute of Transportation Engineers (ITE). Specifically, the following source has been utilized:

- Trip Generation, 11th Edition.

For conservatism in the analysis, no adjustments have been made for mode choice, as the mode choice in the site environs is predominantly via private automobile. Various manufacturing, industrial, and warehouse uses are permitted in the M-2(S)-R zone. Such uses could be accommodated within the proposed project. Several representative permitted land uses are included in the ITE data:

- Code 110 – General Light Industrial
- Code 130 – Industrial Park
- Code 140 – Manufacturing
- Code 150 – Warehousing
- Code 154 – High-Cube Transload and Short-Term Storage Warehouse

- Code 155 – High-Cube Fulfillment Center Warehouse – Non-Sort
- Code 156 – High-Cube Parcel Hub Warehouse

VEHICULAR TRIP GENERATION ESTIMATES

Table 1 summarizes trip generation for these land use types. Additional descriptive information on each land use type is included in the appendix.

TABLE 1: VEHICULAR TRIP GENERATION ESTIMATES

USE	ITE CODE	SIZE (1,000 SQUARE FEET)	VEHICLE TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
GENERAL LIGHT INDUSTRIAL	110		565	85	12	97	7	43	50
INDUSTRIAL PARK	130		1,105	37	9	46	10	36	46
MANUFACTURING	140		717	71	22	93	31	70	101
WAREHOUSING	150		254	31	9	40	12	31	43
HIGH-CUBE TRANSLOAD AND SHORT-TERM STORAGE WAREHOUSE	154	136.72	191	8	3	11	4	10	14
HIGH-CUBE FULFILLMENT CENTER WAREHOUSE - NON-SORT	155		100	17	4	21	9	13	22
HIGH-CUBE PARCEL HUB WAREHOUSE	156		633	48	48	96	60	28	88

NOTE: PEAK HOUR REFERS TO PEAK HOUR OF ADJACENT STREET TRAFFIC.

SOURCE: ITE TRIP GENERATION, 11TH EDITION, 2021.

TRUCK TRIP GENERATION ESTIMATES

ITE Trip Generation, 11th Edition, also provides information on the number of truck trips generated by each of the land use categories. Table 2 summarizes the truck trip generation.

TABLE 2: TRUCK TRIP GENERATION ESTIMATES

USE	ITE CODE	SIZE (1,000 SQUARE FEET)	TRUCK TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
GENERAL LIGHT INDUSTRIAL	110		34	1	0	1	1	0	1
INDUSTRIAL PARK	130		78	2	3	5	2	3	5
MANUFACTURING	140		62	2	2	4	2	2	4
WAREHOUSING	150		81	2	1	3	2	2	4
HIGH-CUBE TRANSLOAD AND SHORT-TERM STORAGE WAREHOUSE	154	136.72	30	1	2	3	0	1	1
HIGH-CUBE FULFILLMENT CENTER WAREHOUSE - NON-SORT	155		31	2	1	3	0	1	1
HIGH-CUBE PARCEL HUB WAREHOUSE	156		79	6	6	12	4	4	8

SOURCE: ITE TRIP GENERATION, 11TH EDITION, 2021.

RECOMMENDED VEHICULAR TRIP GENERATION ESTIMATES

As the transportation analysis will focus on peak weekday commuter period intersection operations, the manufacturing trip generation estimates (Code 140) have been selected for analysis, as they provide the most conservative (highest) peak hour estimates of total vehicle trips. Table 3 summarizes the recommended trip generation estimates.

TABLE 3: RECOMMENDED VEHICULAR TRIP GENERATION ESTIMATES

USE	VEHICLE TYPE	SIZE (1,000 SQUARE FEET)	VEHICLE TRIPS GENERATED (TRIP-ENDS)						
			WEEK-DAY	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
MANUFACTURING	TRUCKS	136.72	62	2	2	4	2	2	4
	TOTAL		717	71	22	93	31	70	101

SOURCE: ITE TRIP GENERATION, 11TH EDITION, 2021.

HOURLY TRIP GENERATION ESTIMATES

For the determination of vehicle volumes for traffic signal warrants, trip generation was estimated for the manufacturing land use for all 24 hours of a typical weekday based on ITE Trip Generation, 11th Edition, information. The ITE information provides a percentage of land use trips entering and exiting a site for each hour of the day. As the hourly information is from a different data sample and is independent of project size, the hourly percentages were proportionally adjusted to match the AM and PM peak hour volume estimates. The derivation of the hourly adjustments is documented in the Appendix. Traffic counts collected on Wednesday, October 13, 2021, at the intersection of Osage Avenue and South Watt Avenue found that the AM peak hour occurs from 7:15 to 8:15 AM, while the PM peak hour occurs from 4:30 to 5:30 PM. Table 4 summarizes the hourly trip generation.

TABLE 4: HOURLY TRIP GENERATION ESTIMATES

TIME	TRIPS GENERATED (TRIP-ENDS)					
	ALL VEHICLE TRIPS			TRUCK TRIPS		
	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
12:00 - 1:00 AM	1	6	7	0	0	0
1:00 - 2:00 AM	1	4	5	0	0	0
2:00 - 3:00 AM	1	3	4	0	0	0
3:00 - 4:00 AM	1	2	3	0	1	1
4:00 - 5:00 AM	4	1	5	0	0	0
5:00 - 6:00 AM	9	0	9	0	0	0
6:00 - 7:00 AM	52	8	60	1	1	2
7:00 - 8:00 AM	72	20	92	2	2	4
8:00 - 9:00 AM	23	11	34	3	3	6
9:00 - 10:00 AM	12	9	21	3	3	6
10:00 - 11:00 AM	10	9	19	4	3	7
11:00 - 12:00 PM	19	15	34	3	3	6
12:00 - 1:00 PM	27	19	46	2	3	5
1:00 - 2:00 PM	20	21	41	3	2	5
2:00 - 3:00 PM	16	22	38	2	2	4
3:00 - 4:00 PM	28	64	92	3	3	6
4:00 - 5:00 PM	23	56	79	2	2	4
5:00 - 6:00 PM	17	47	64	1	1	2
6:00 - 7:00 PM	4	8	12	1	1	2
7:00 - 8:00 PM	3	5	8	1	0	1
8:00 - 9:00 PM	3	5	8	0	1	1
9:00 - 10:00 PM	4	7	11	0	0	0
10:00 - 11:00 PM	5	7	12	0	0	0
11:00 - 12:00 AM	4	9	13	0	0	0
TOTAL	359	358	717	31	31	62
AM PEAK HOUR (7:15 TO 8:15 AM)	71	22	93	2	2	4
PM PEAK HOUR (4:30 TO 5:30 PM)	31	70	101	2	2	4

NOTE: PEAK HOUR REFERS TO PEAK HOUR OF ADJACENT STREET TRAFFIC.

SOURCE: ITE TRIP GENERATION, 11TH EDITION, 2021.

TRIP DISTRIBUTION ESTIMATION

Vehicular trip distribution estimates of the project are based upon:

- Traffic counts collected at the intersection of Osage Avenue and South Watt Avenue on Wednesday, October 13, 2021, from 6:00 AM to 10:00 PM
- The functional and physical characteristics of area roadways
- Travel patterns of nearby industrial land uses

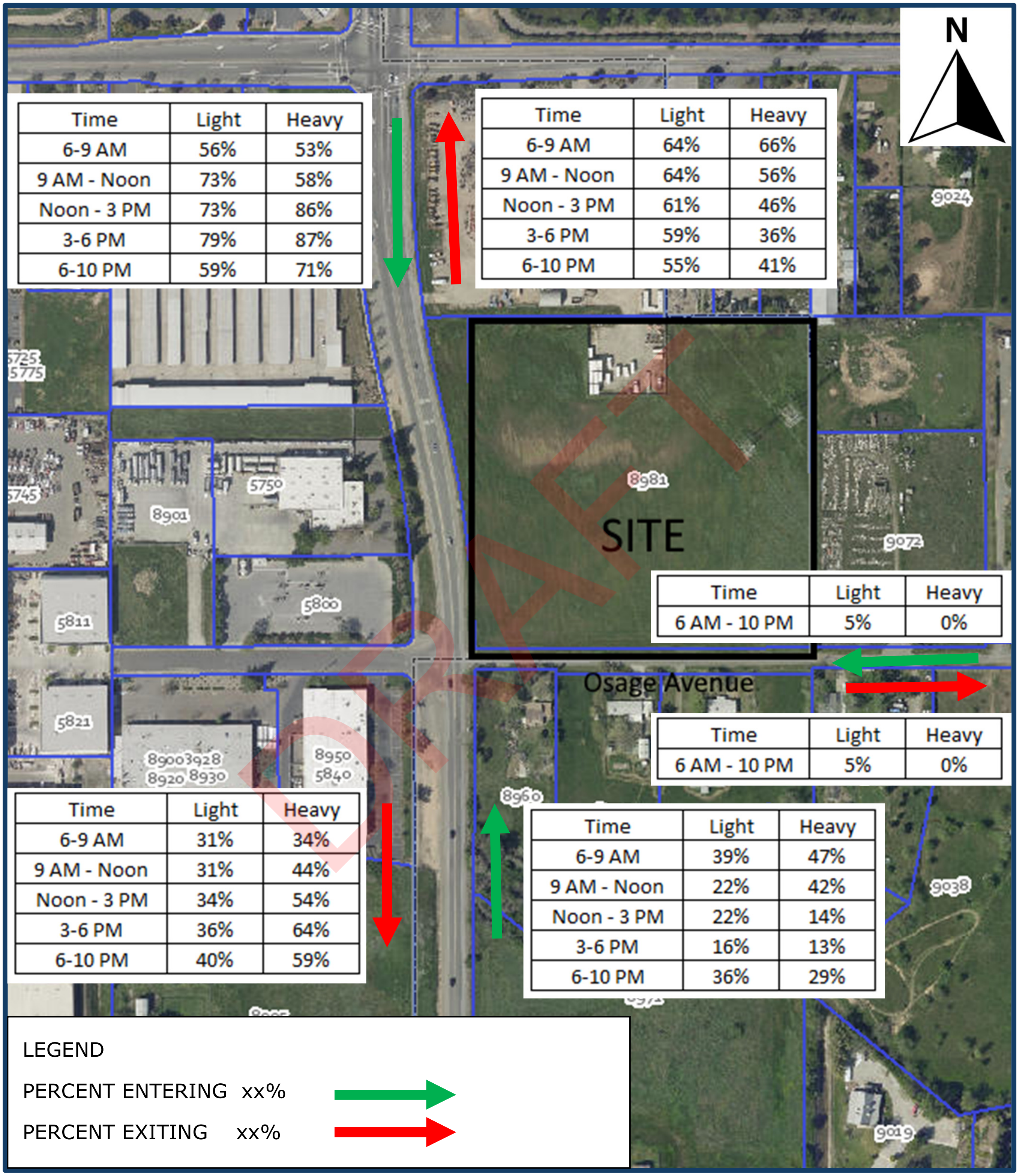
The traffic counts collected at the adjacent intersection segregated motorized vehicles by type – light, articulated trucks, and medium. For trip distribution purposes, light vehicles (typically automobiles and single-unit, 4-wheel trucks) were separated from "heavy" vehicles (articulated trucks and medium vehicles).

The west leg of the intersection of Osage Avenue and South Watt Avenue is a dead-end street, providing access to industrial and commercial uses. Intersection turning movements into and out of this leg of Osage Avenue provided information on distribution patterns.

Regarding trips on Osage Avenue east of South Watt Avenue, the current travel patterns show that fewer than three percent of trips associated with the uses west of South Watt Avenue use this roadway. For trip distribution purposes of the proposed warehouse at 8981 Osage Avenue, it was assumed that 5 percent of light vehicle trips would use Osage Avenue east of the warehouse, and that heavy vehicle traffic to and from the warehouse would be prohibited from using the roadway due to the current condition of the roadway. Osage Avenue east of South Watt Avenue is typically less than 20 feet wide, and the pavement is in poor condition.

Figure 1 illustrates the resultant trip distribution by time of day for light and heavy vehicles.

FIGURE 1: ESTIMATED TRIP DISTRIBUTION



Time	Light	Heavy
6-9 AM	56%	53%
9 AM - Noon	73%	58%
Noon - 3 PM	73%	86%
3-6 PM	79%	87%
6-10 PM	59%	71%

Time	Light	Heavy
6-9 AM	64%	66%
9 AM - Noon	64%	56%
Noon - 3 PM	61%	46%
3-6 PM	59%	36%
6-10 PM	55%	41%

Time	Light	Heavy
6 AM - 10 PM	5%	0%

Time	Light	Heavy
6 AM - 10 PM	5%	0%

Time	Light	Heavy
6-9 AM	31%	34%
9 AM - Noon	31%	44%
Noon - 3 PM	34%	54%
3-6 PM	36%	64%
6-10 PM	40%	59%

Time	Light	Heavy
6-9 AM	39%	47%
9 AM - Noon	22%	42%
Noon - 3 PM	22%	14%
3-6 PM	16%	13%
6-10 PM	36%	29%

APPENDIX

Land Use: 110
General Light Industrial

Description

A light industrial facility is a free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment. Industrial park (Land Use 130) and manufacturing (Land Use 140) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 2000s, and the 2010s in Colorado, Connecticut, Indiana, New Jersey, New York, Oregon, Pennsylvania, and Texas.

Source Numbers

106, 157, 174, 177, 179, 184, 191, 251, 253, 286, 300, 611, 874, 875, 912

General Light Industrial
(110)

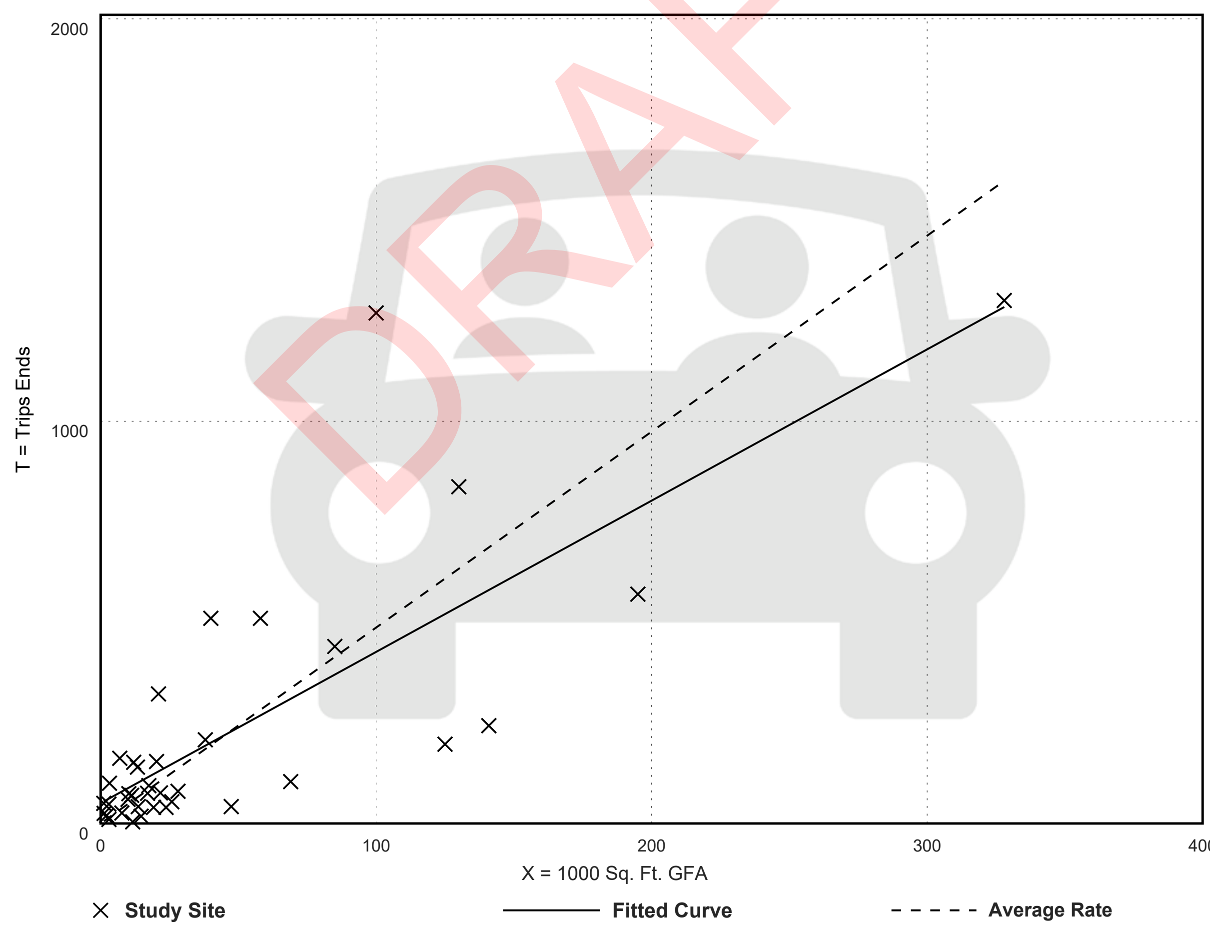
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. 1000 Sq. Ft. GFA: 45
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.87	0.34 - 43.86	4.08

Data Plot and Equation



Fitted Curve Equation: T = 3.76(X) + 50.47 **R^2= 0.61**

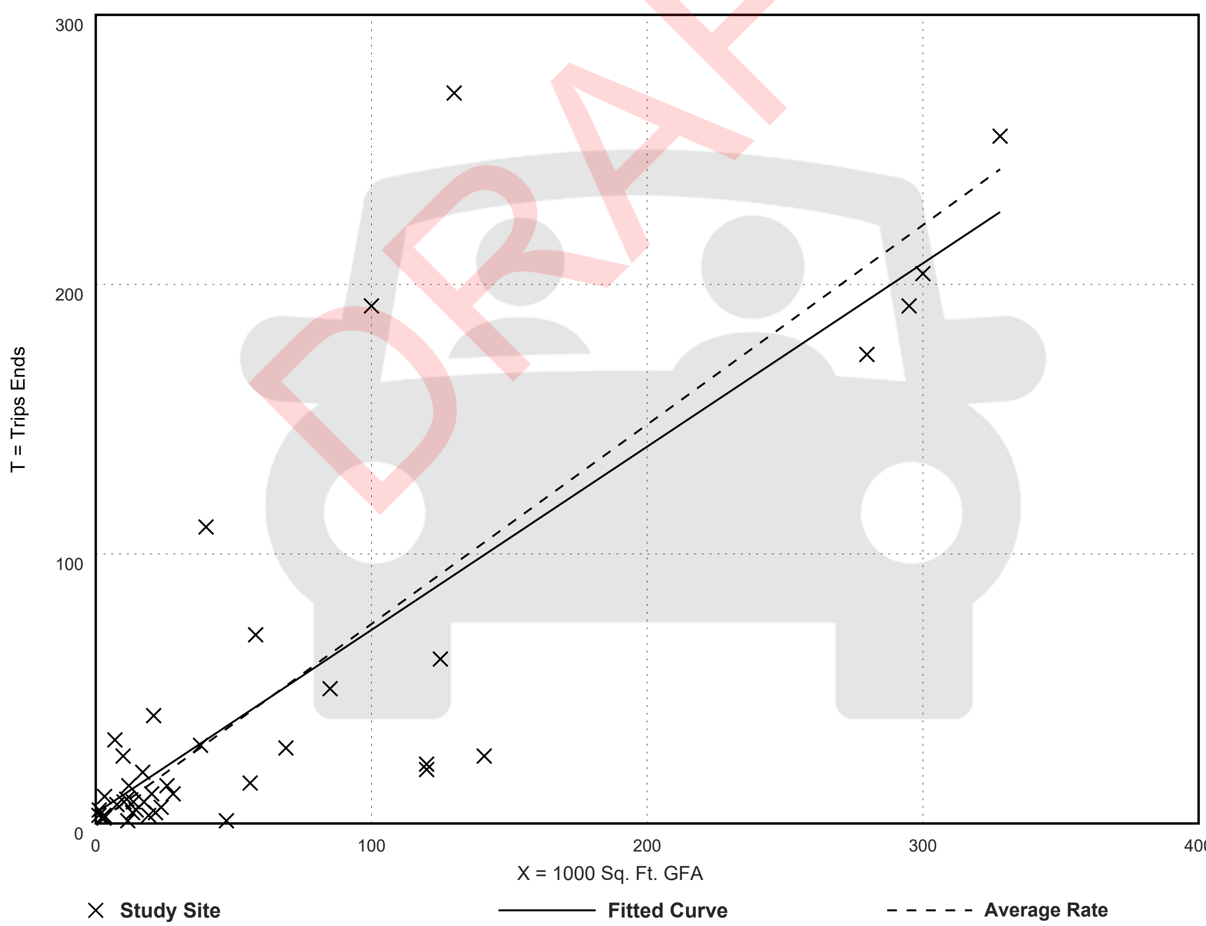
General Light Industrial
(110)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	41
Avg. 1000 Sq. Ft. GFA:	65
Directional Distribution:	88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.02 - 4.46	0.61

Data Plot and Equation



Fitted Curve Equation: $T = 0.68(X) + 3.81$

$R^2 = 0.66$

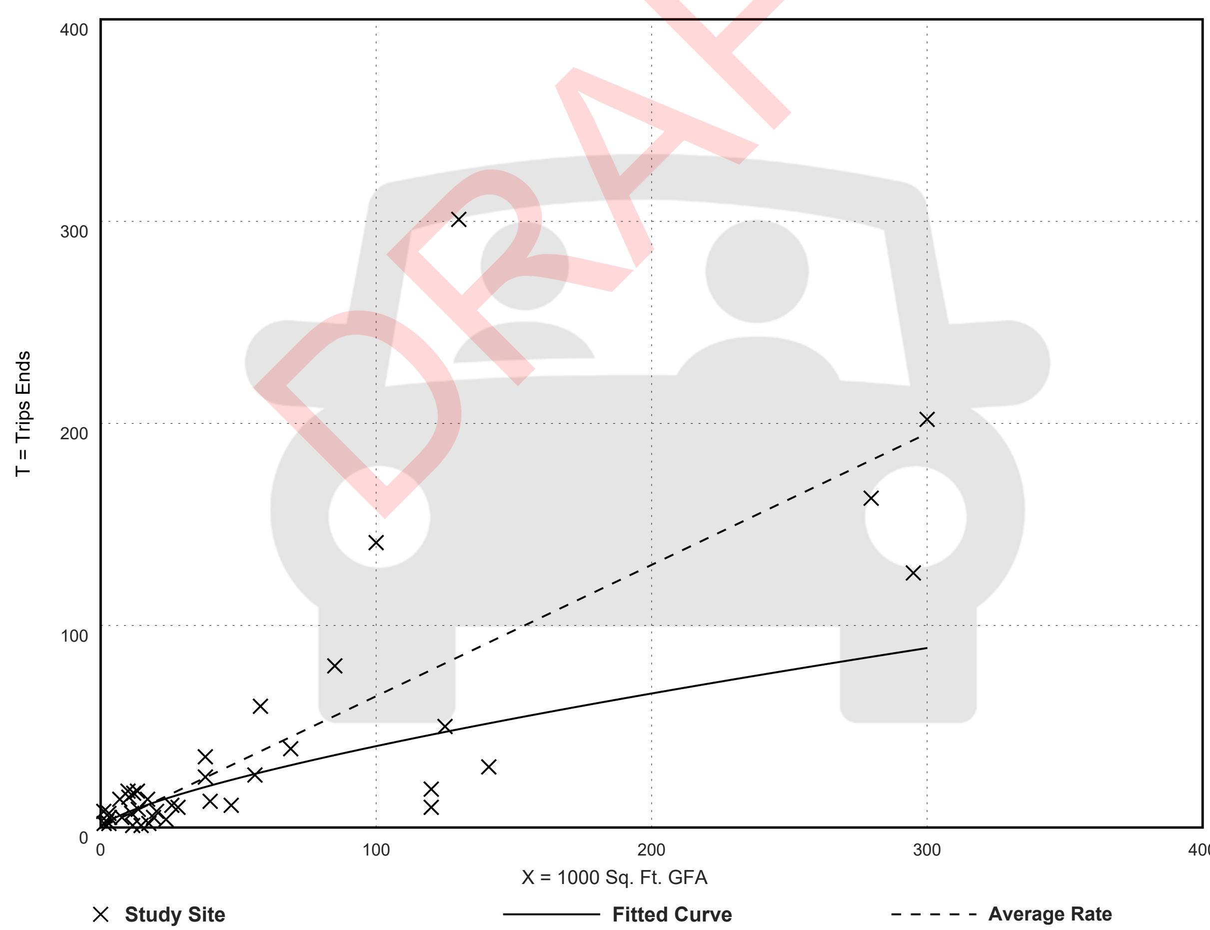
General Light Industrial
(110)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	40
Avg. 1000 Sq. Ft. GFA:	58
Directional Distribution:	14% entering, 86% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.65	0.07 - 7.02	0.56

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.72\ Ln(X) + 0.38$ **$R^2 = 0.55$**

General Light Industrial
(110)

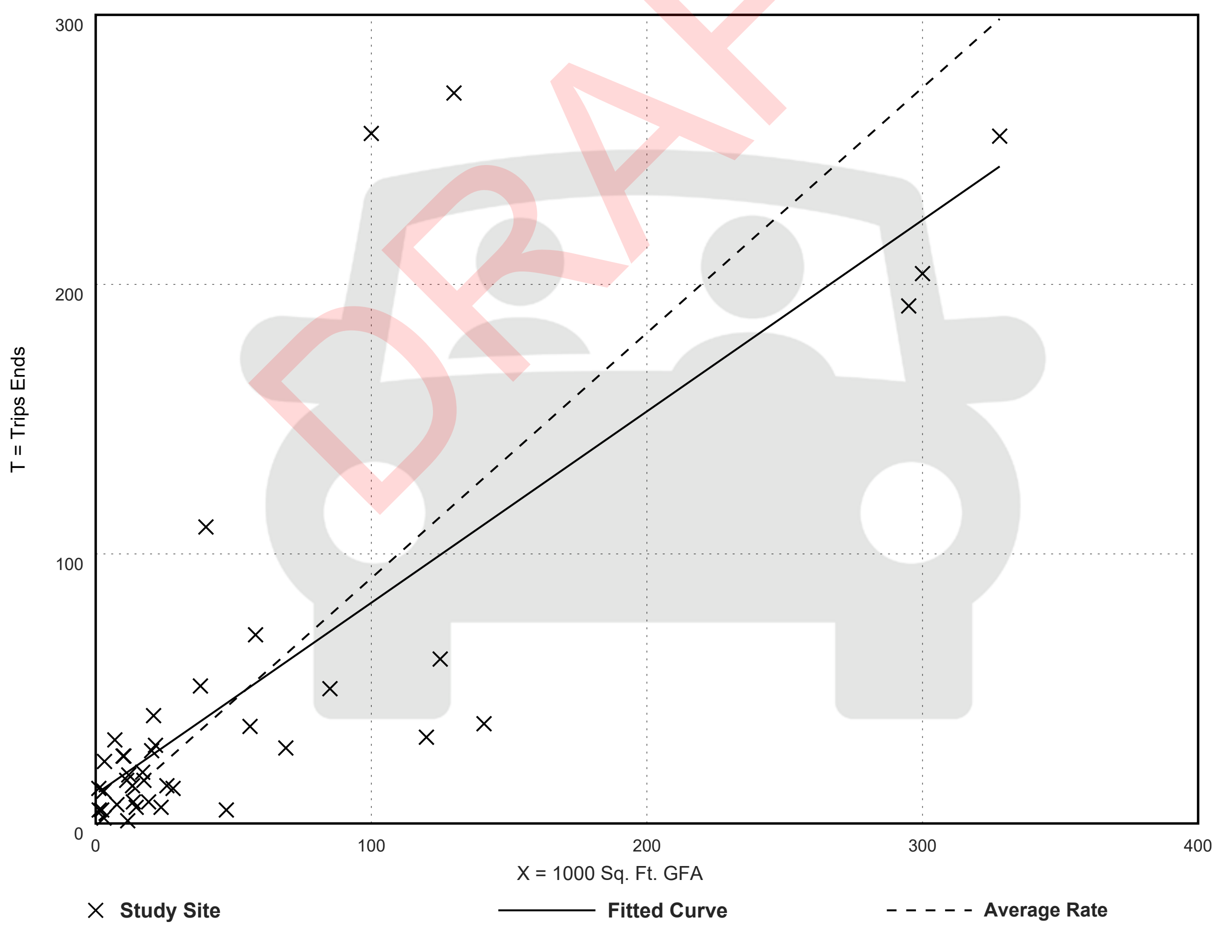
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. 1000 Sq. Ft. GFA: 56
Directional Distribution: 87% entering, 13% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.91	0.09 - 11.40	0.78

Data Plot and Equation



Fitted Curve Equation: T = 0.71(X) + 10.88 **R^2= 0.62**

General Light Industrial
(110)

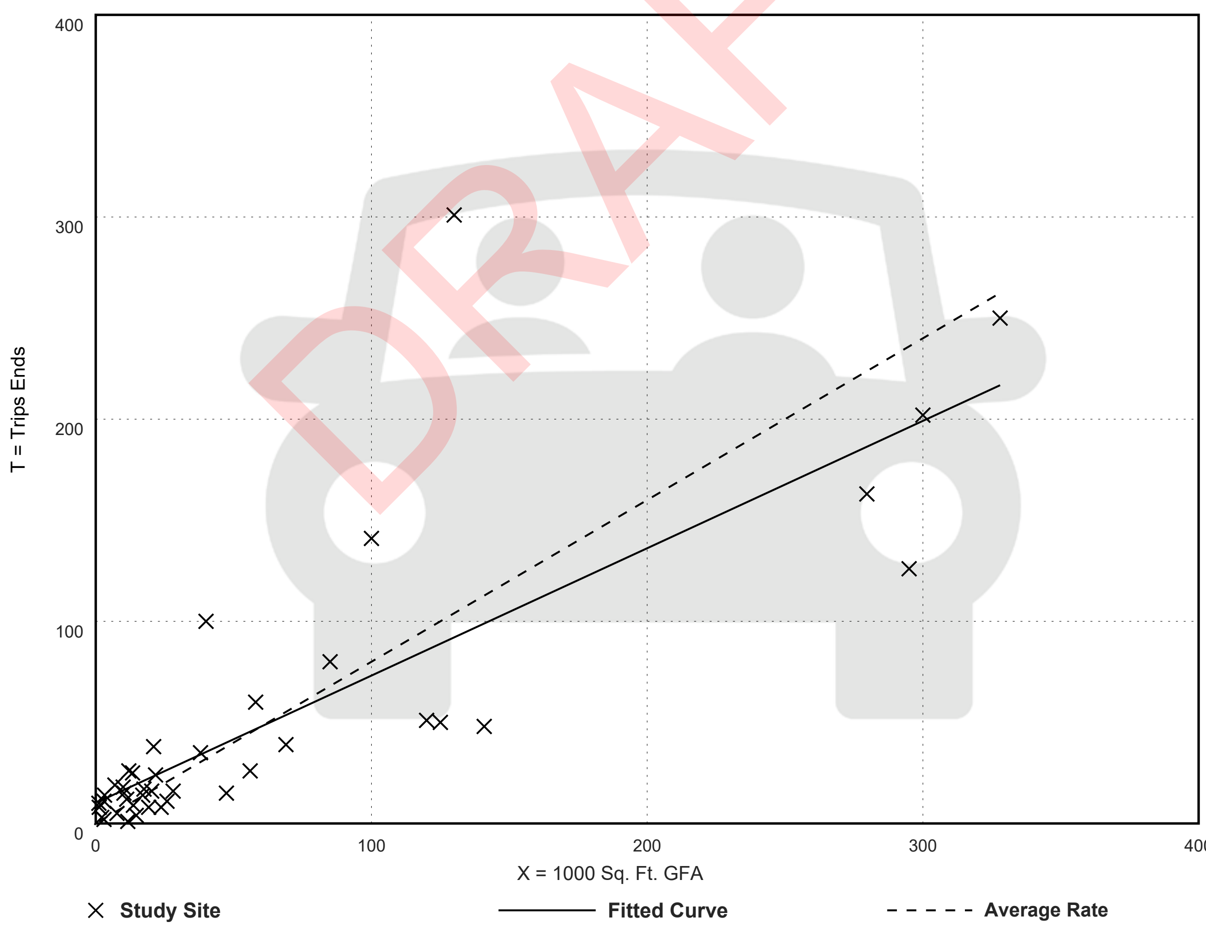
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 41
Avg. 1000 Sq. Ft. GFA: 62
Directional Distribution: 18% entering, 82% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.80	0.09 - 8.77	0.61

Data Plot and Equation



Fitted Curve Equation: T = 0.63(X) + 10.15 **R^2= 0.65**

General Light Industrial
(110)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday

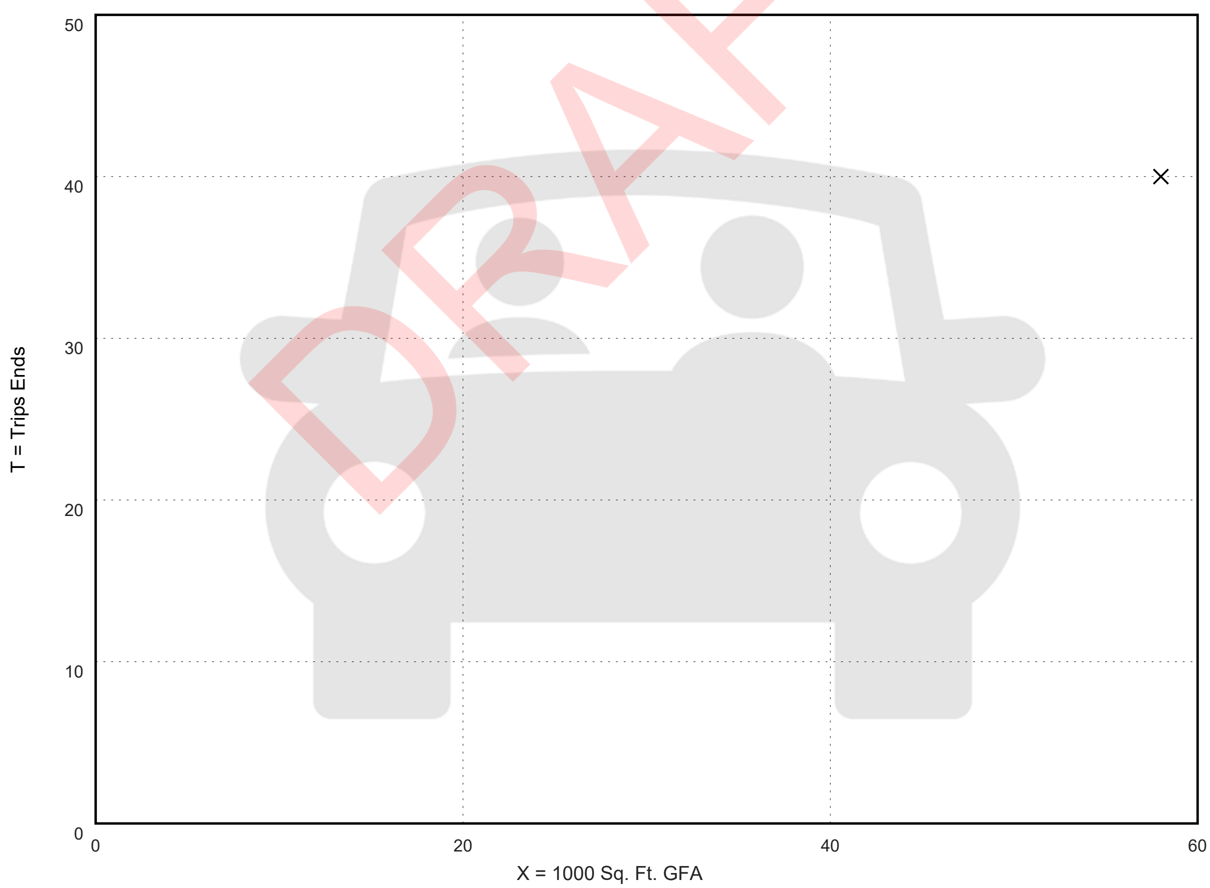
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 58
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.69	0.69 - 0.69	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= ***

General Light Industrial
(110)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday

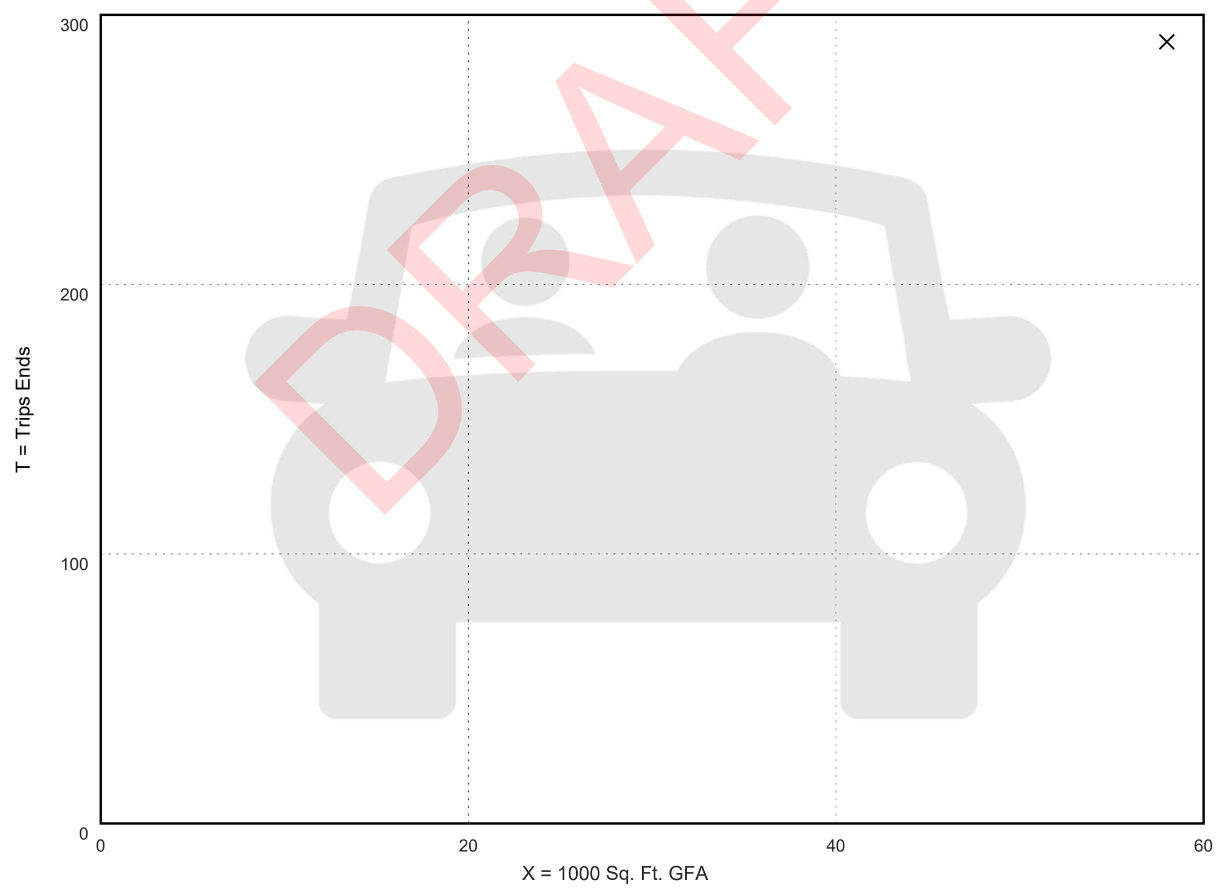
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 58
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
5.00	5.00 - 5.00	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

General Light Industrial
(110)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

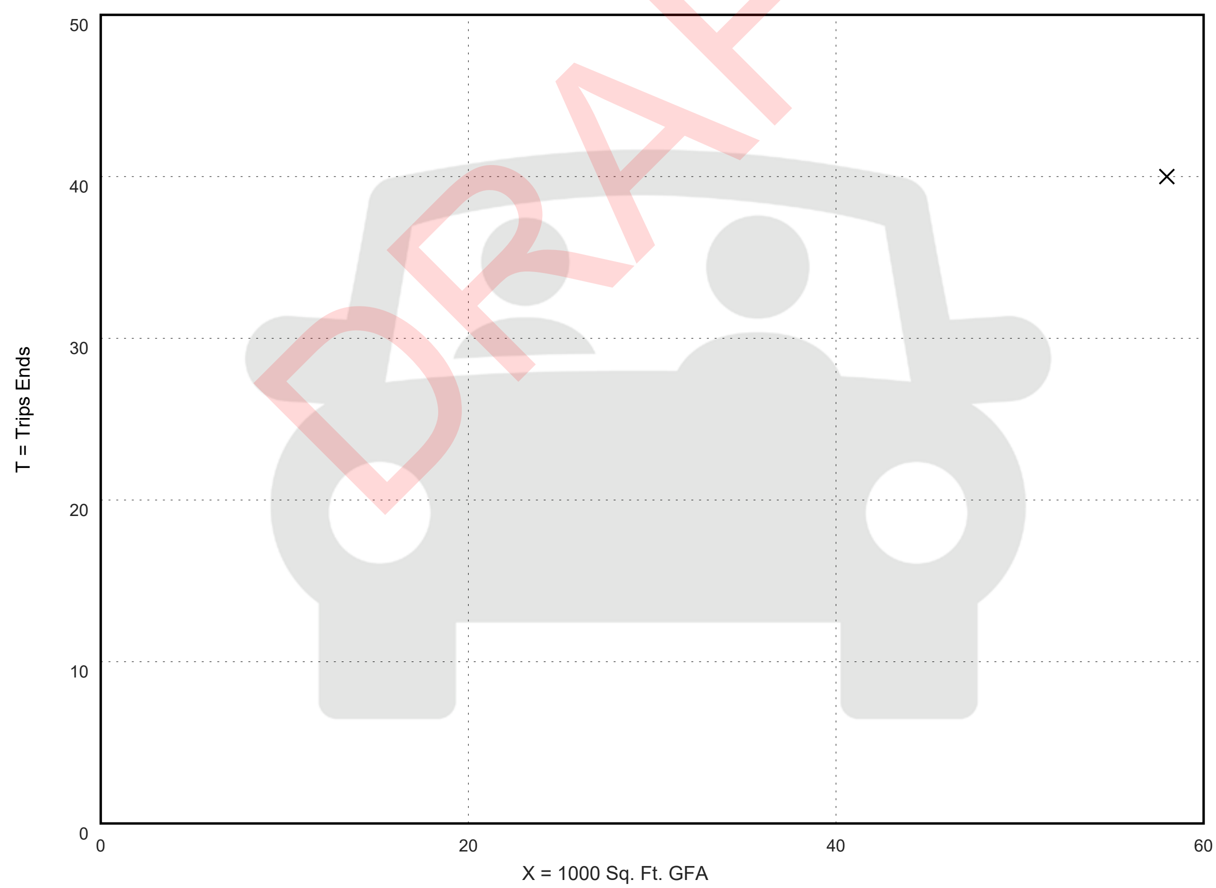
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 58
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.69	0.69 - 0.69	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

General Light Industrial
(110)

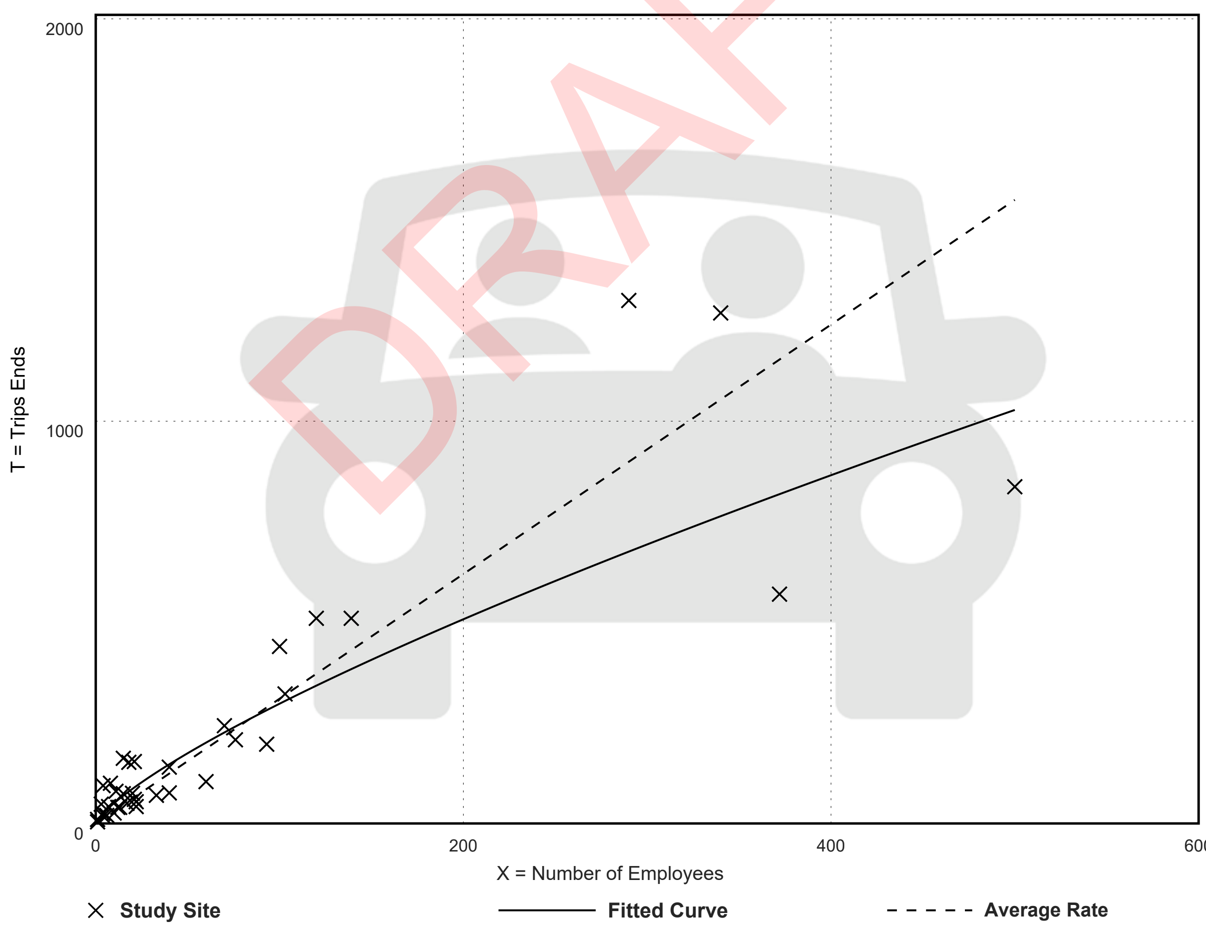
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. Num. of Employees: 71
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
3.10	1.53 - 23.50	1.81

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.77 Ln(X) + 2.15 **R^2= 0.83**

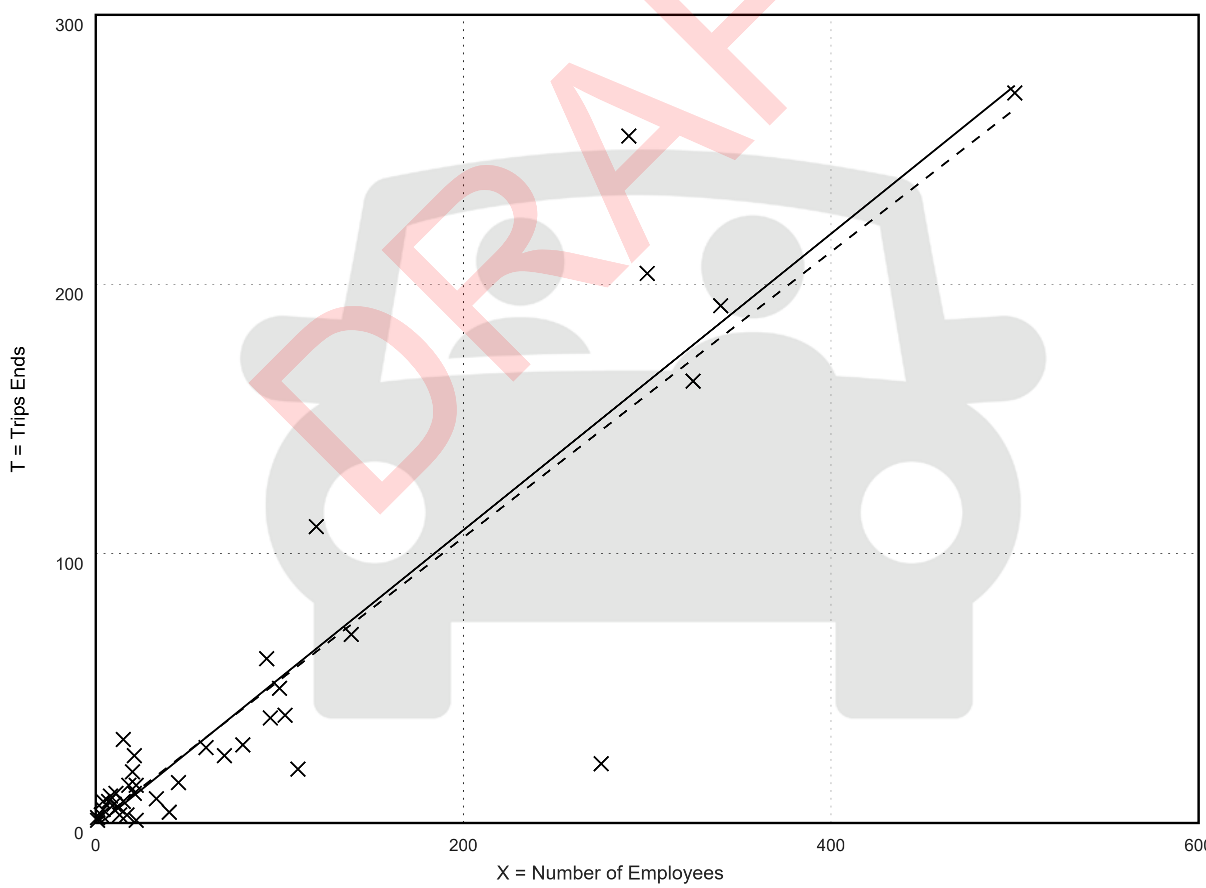
General Light Industrial
(110)

Vehicle Trip Ends vs:	**Employees**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	41
Avg. Num. of Employees:	83
Directional Distribution:	83% entering, 17% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.53	0.05 - 2.07	0.27

Data Plot and Equation



× **Study Site** ——— **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: T = 0.55(X) - 1.28 **R^2= 0.83**

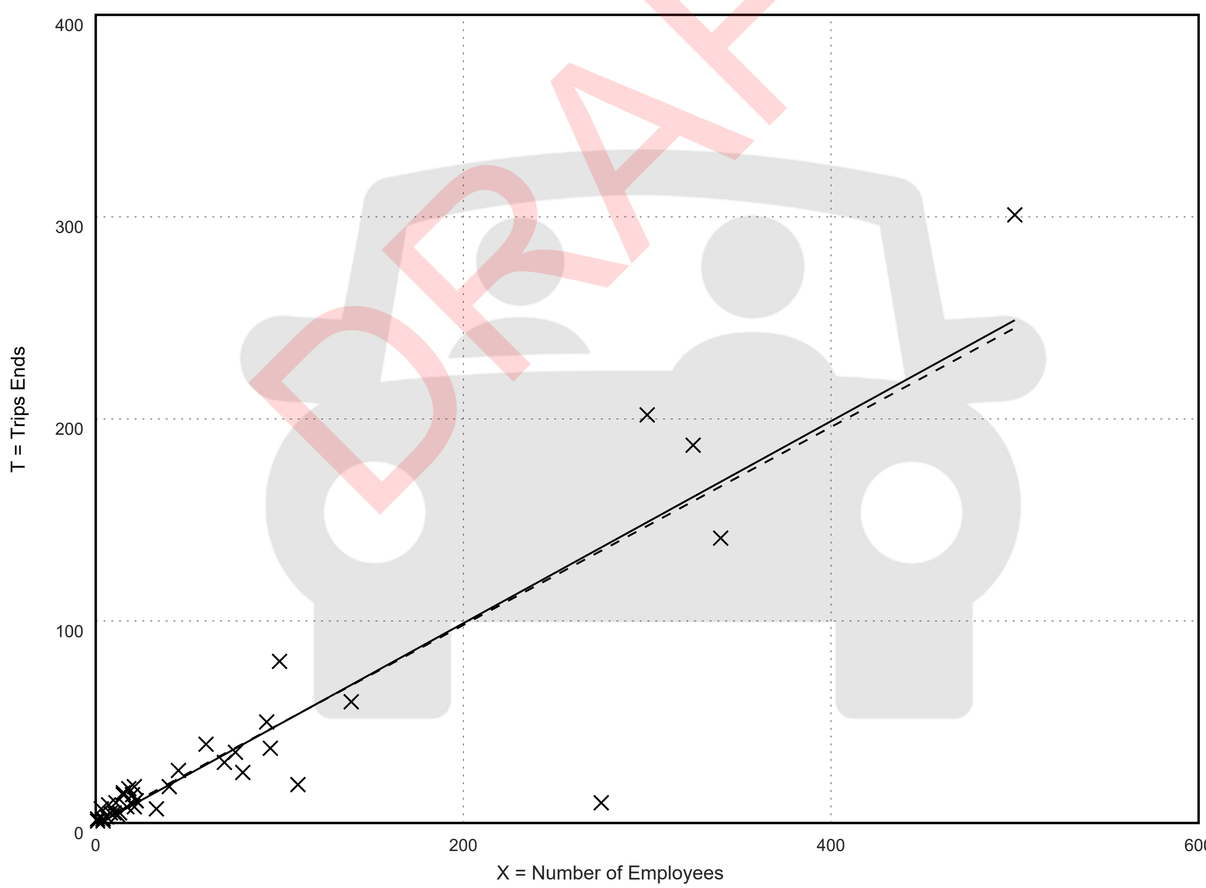
General Light Industrial
(110)

Vehicle Trip Ends vs:	**Employees**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	39
Avg. Num. of Employees:	75
Directional Distribution:	22% entering, 78% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.49	0.04 - 2.33	0.22

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - - - **Average Rate**

Fitted Curve Equation: T = 0.50(X) - 1.12 **R^2= 0.83**

General Light Industrial
(110)

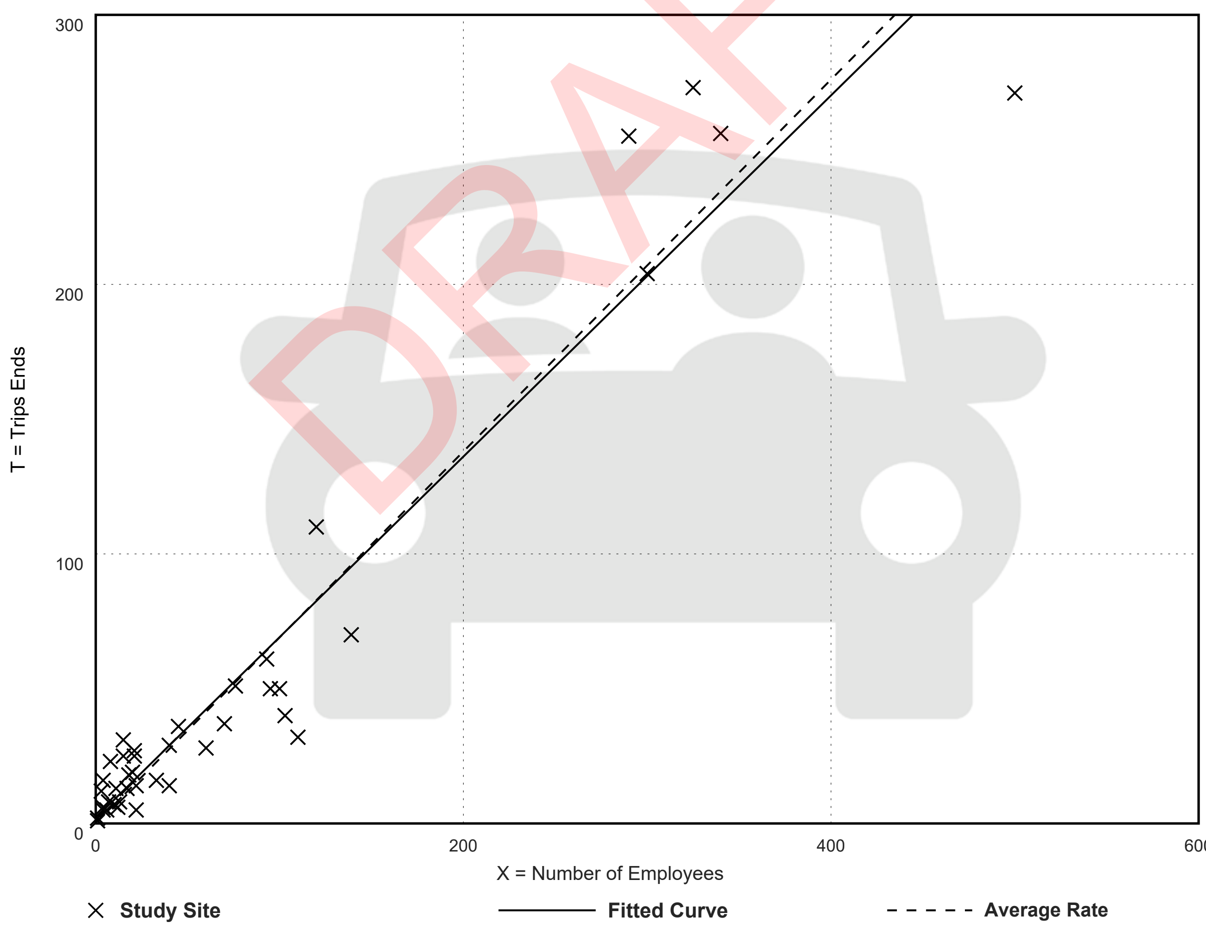
Vehicle Trip Ends vs: Employees
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 41
Avg. Num. of Employees: 76
Directional Distribution: 85% entering, 15% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.69	0.23 - 4.00	0.30

Data Plot and Equation



Fitted Curve Equation: T = 0.67(X) + 2.10 **R^2= 0.93**

General Light Industrial
(110)

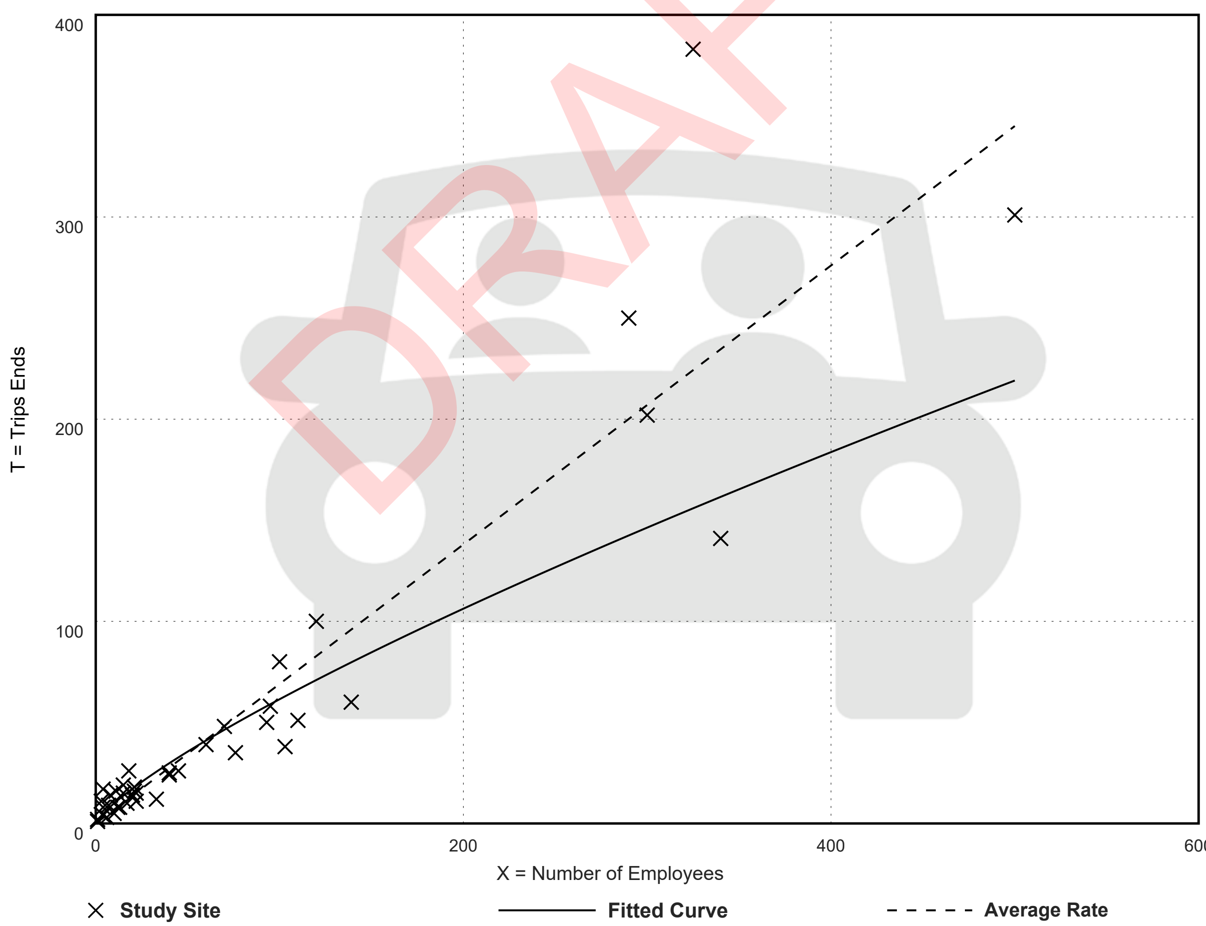
Vehicle Trip Ends vs: Employees
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 41
Avg. Num. of Employees: 76
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.69	0.36 - 4.25	0.30

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.79 Ln(X) + 0.48 **R^2= 0.87**

General Light Industrial
(110)

Vehicle Trip Ends vs: Employees
On a: Saturday

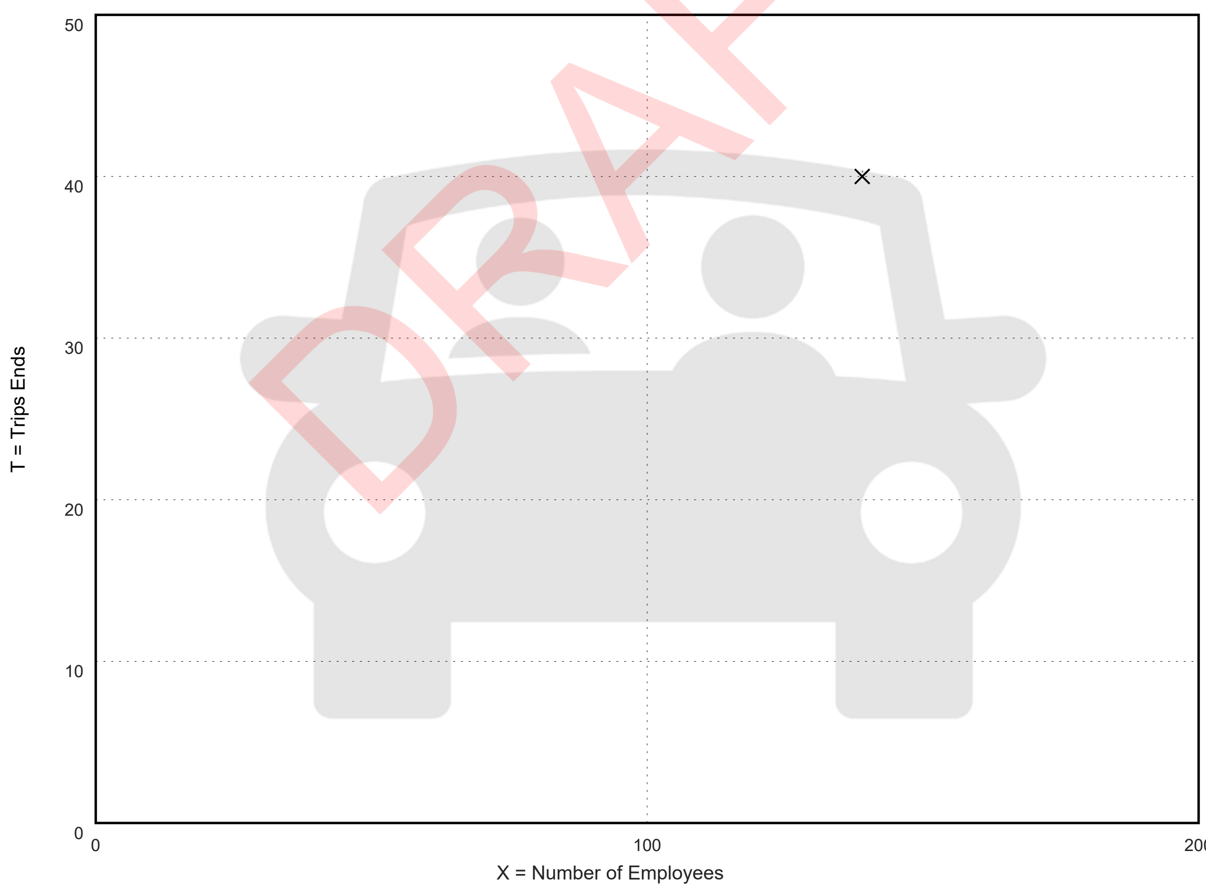
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 139
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.29	0.29 - 0.29	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

General Light Industrial (110)

Vehicle Trip Ends vs: Employees
On a: Sunday

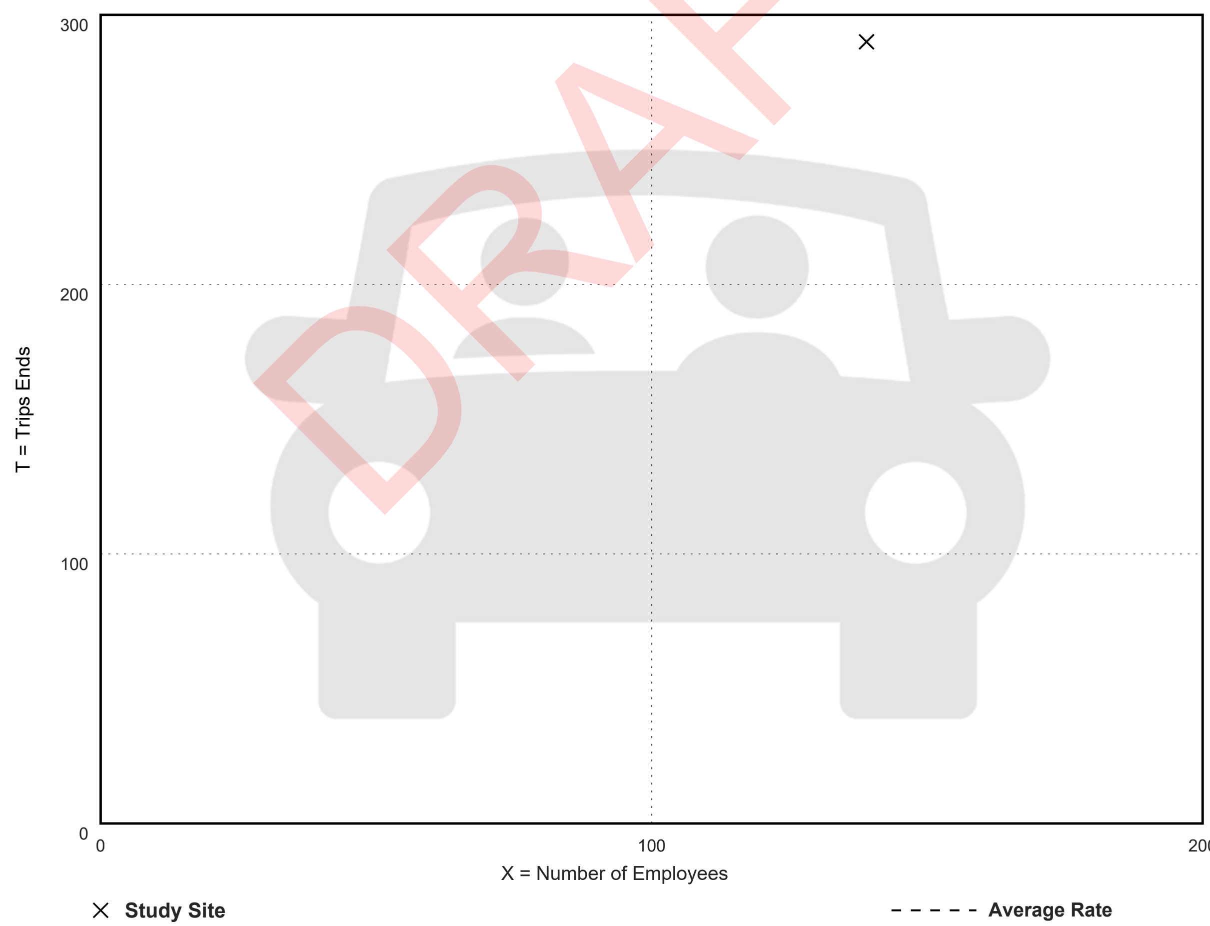
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 139
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
2.09	2.09 - 2.09	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

General Light Industrial
(110)

Vehicle Trip Ends vs: Employees
On a: Sunday, Peak Hour of Generator

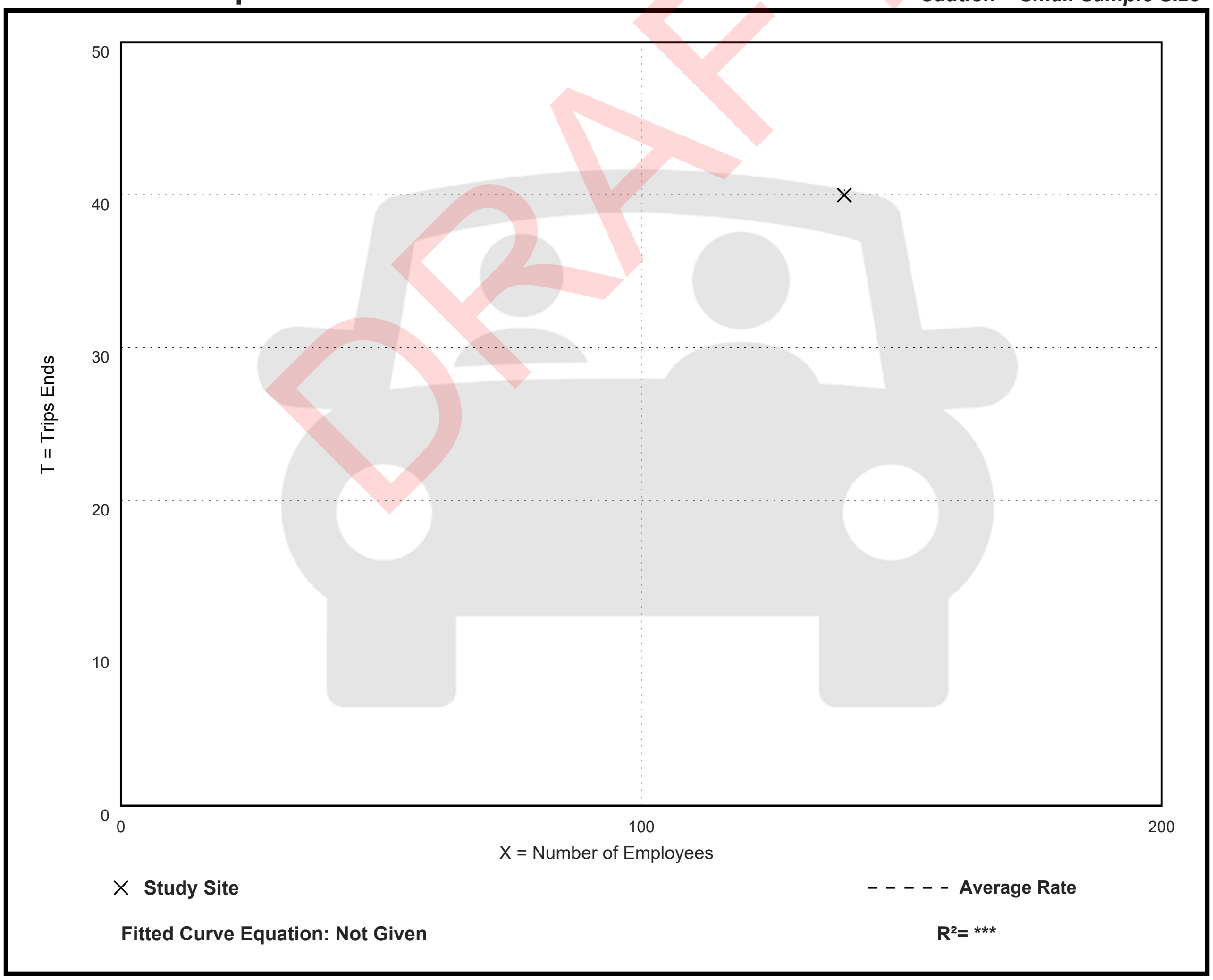
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 139
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.29	0.29 - 0.29	***

Data Plot and Equation

Caution – Small Sample Size



General Light Industrial
(110)

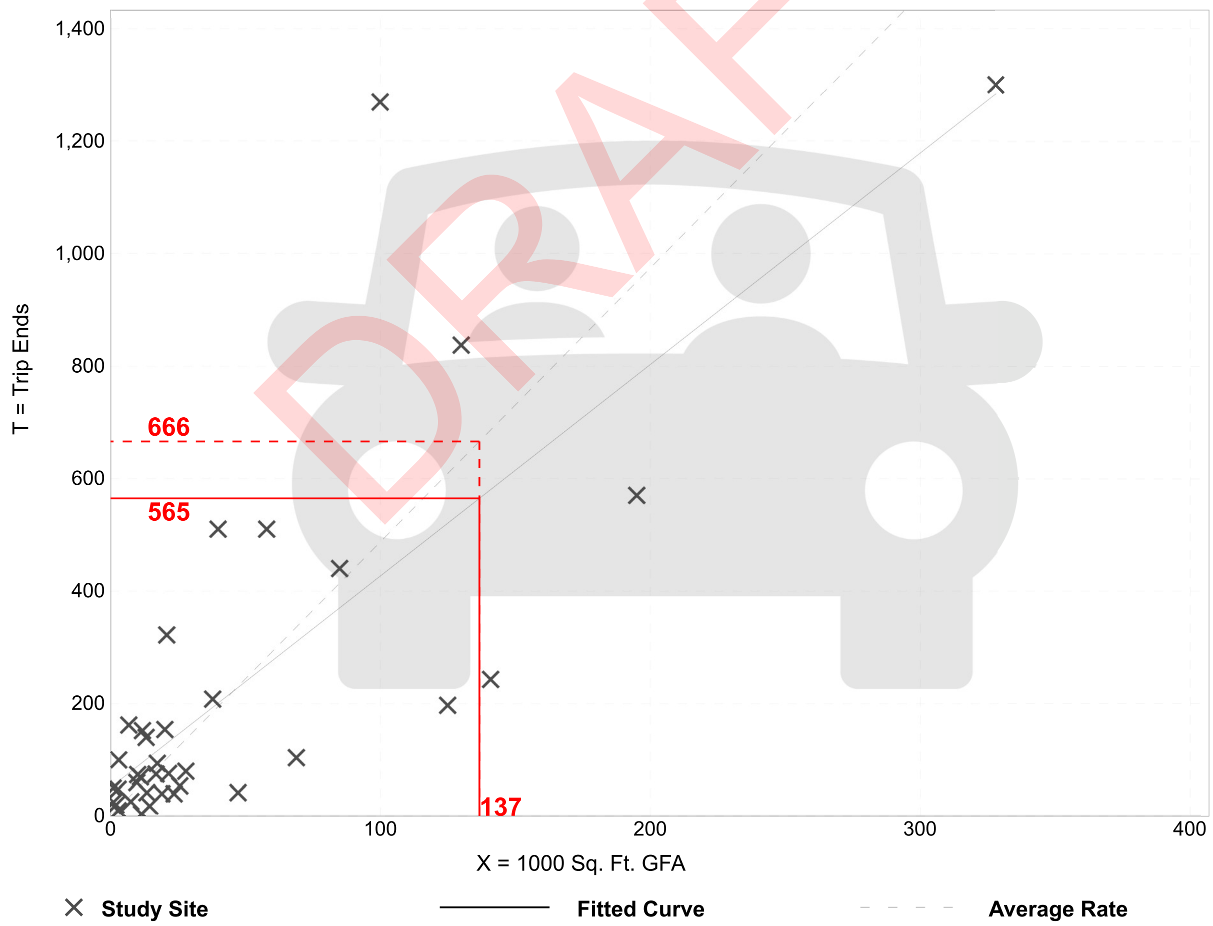
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. 1000 Sq. Ft. GFA: 45
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.87	0.34 - 43.86	4.08

Data Plot and Equation



Fitted Curve Equation: T = 3.76(X) + 50.47 **R^2= 0.61**

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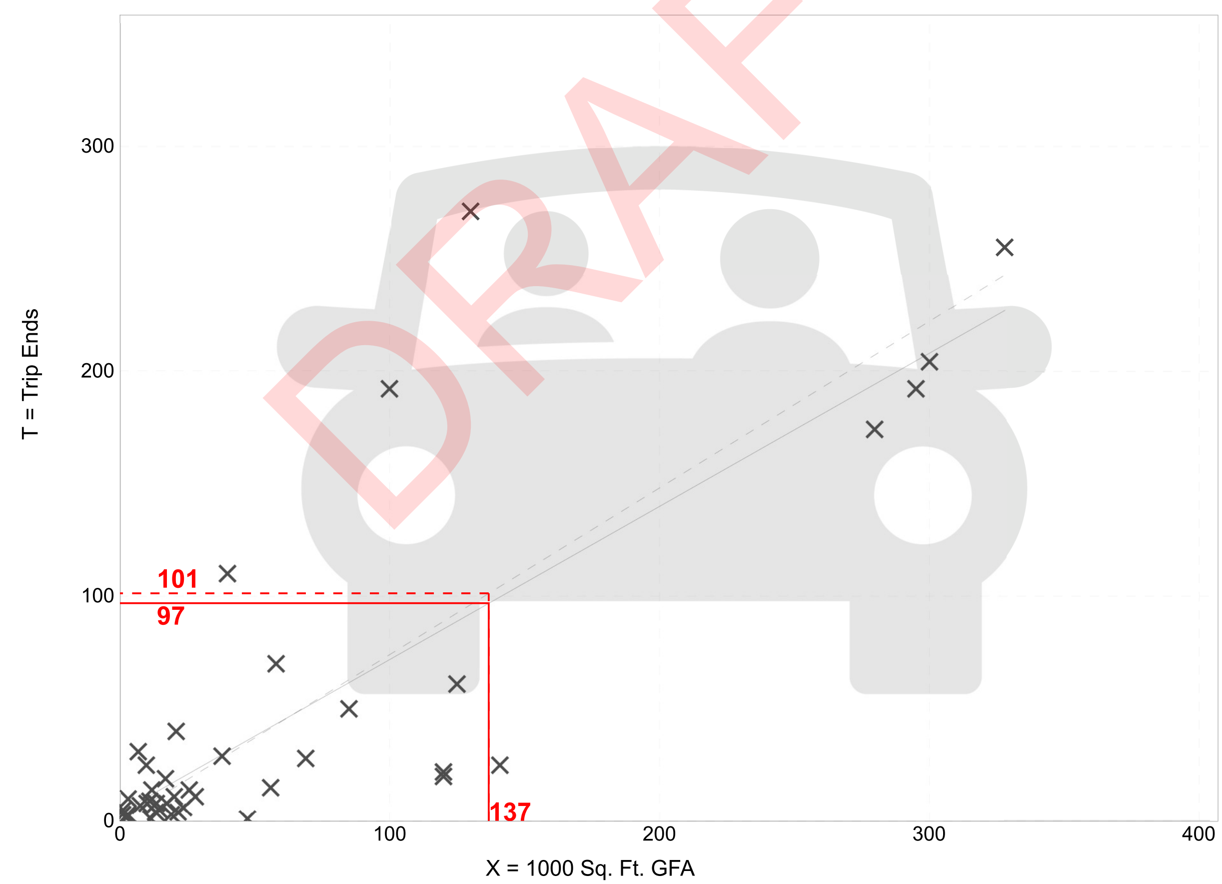
General Light Industrial
(110)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	41
Avg. 1000 Sq. Ft. GFA:	65
Directional Distribution:	88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.02 - 4.46	0.61

Data Plot and Equation



Fitted Curve Equation: $T = 0.68(X) + 3.81$ **R^2= 0.66**

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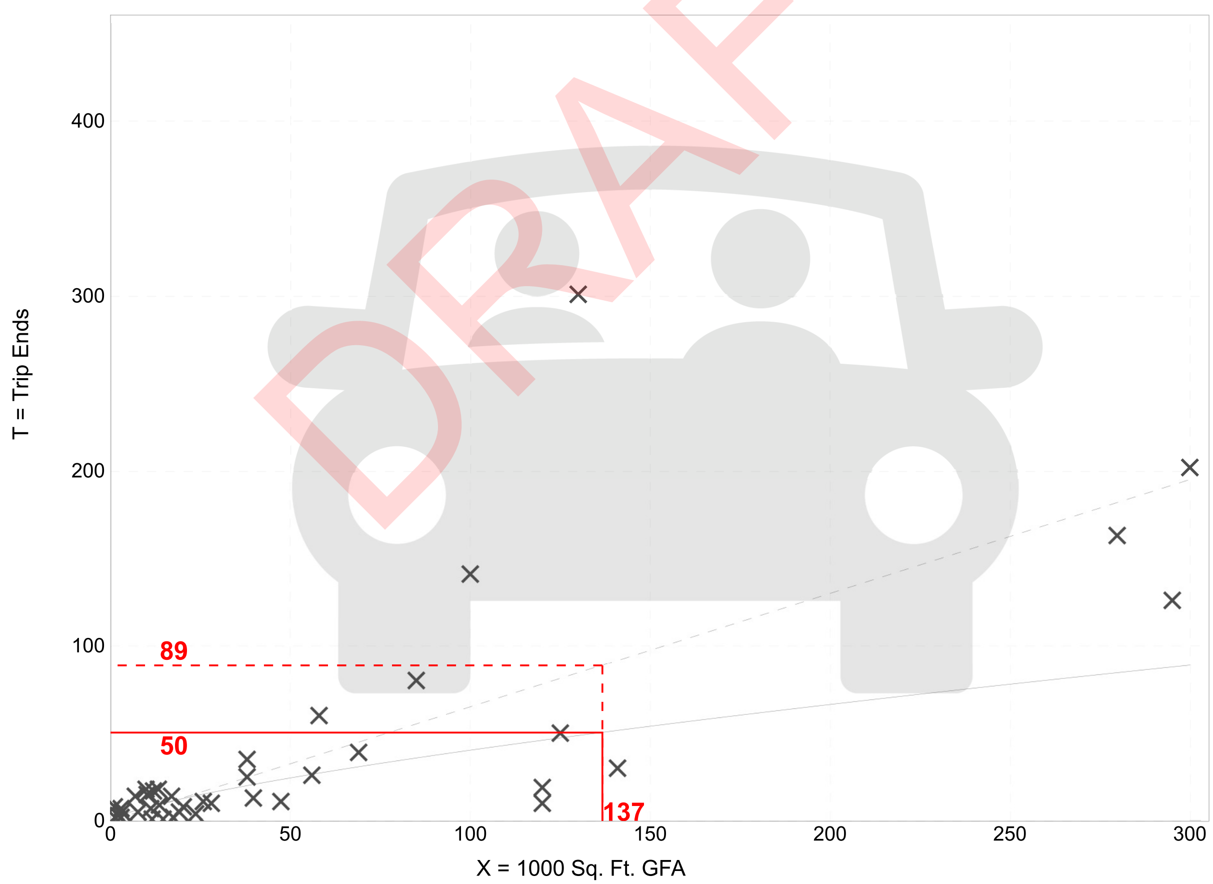
General Light Industrial
(110)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	40
Avg. 1000 Sq. Ft. GFA:	58
Directional Distribution:	14% entering, 86% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.65	0.07 - 7.02	0.56

Data Plot and Equation



× **Study Site** — **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: Ln(T) = 0.72 Ln(X) + 0.38 **R^2= 0.55**

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General Light Industrial
(110)

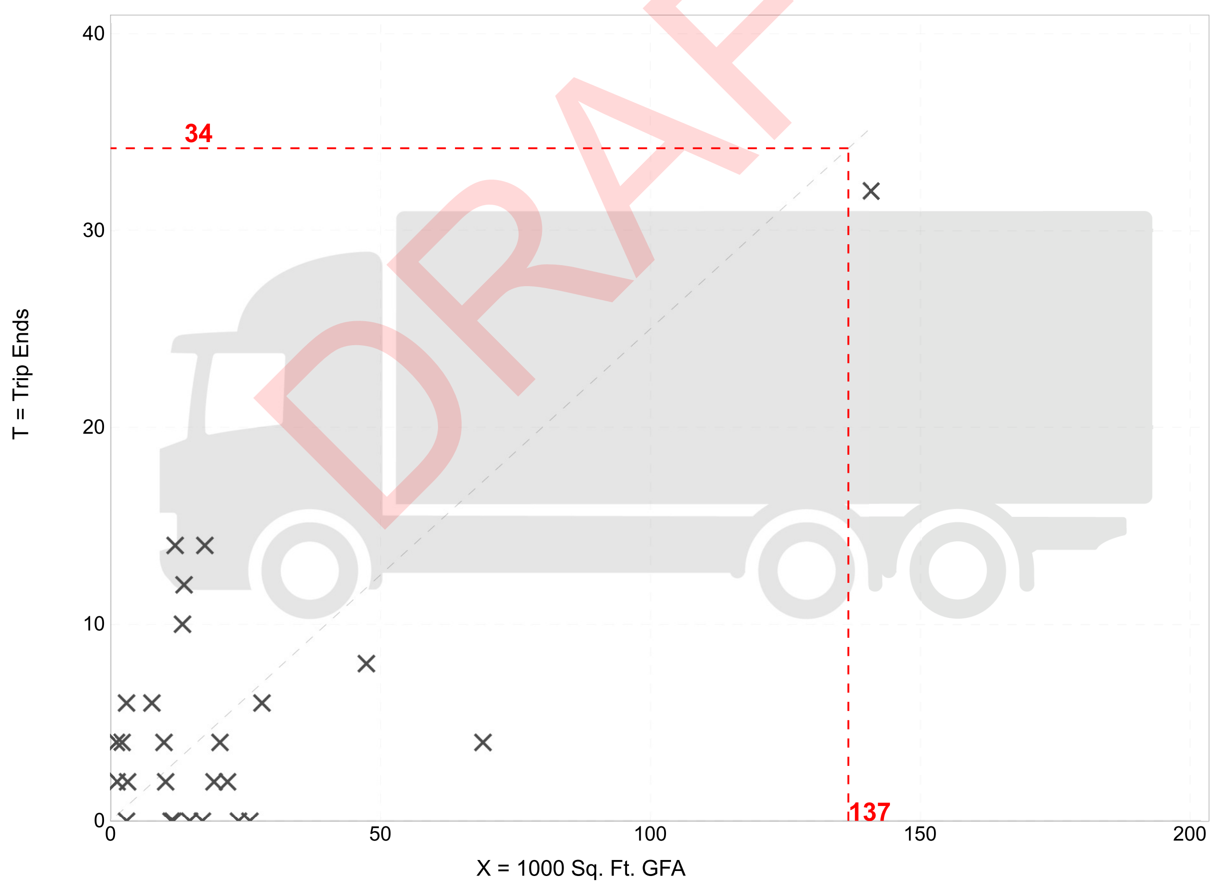
Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 26
Avg. 1000 Sq. Ft. GFA: 21
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.25	0.00 - 3.51	0.36

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

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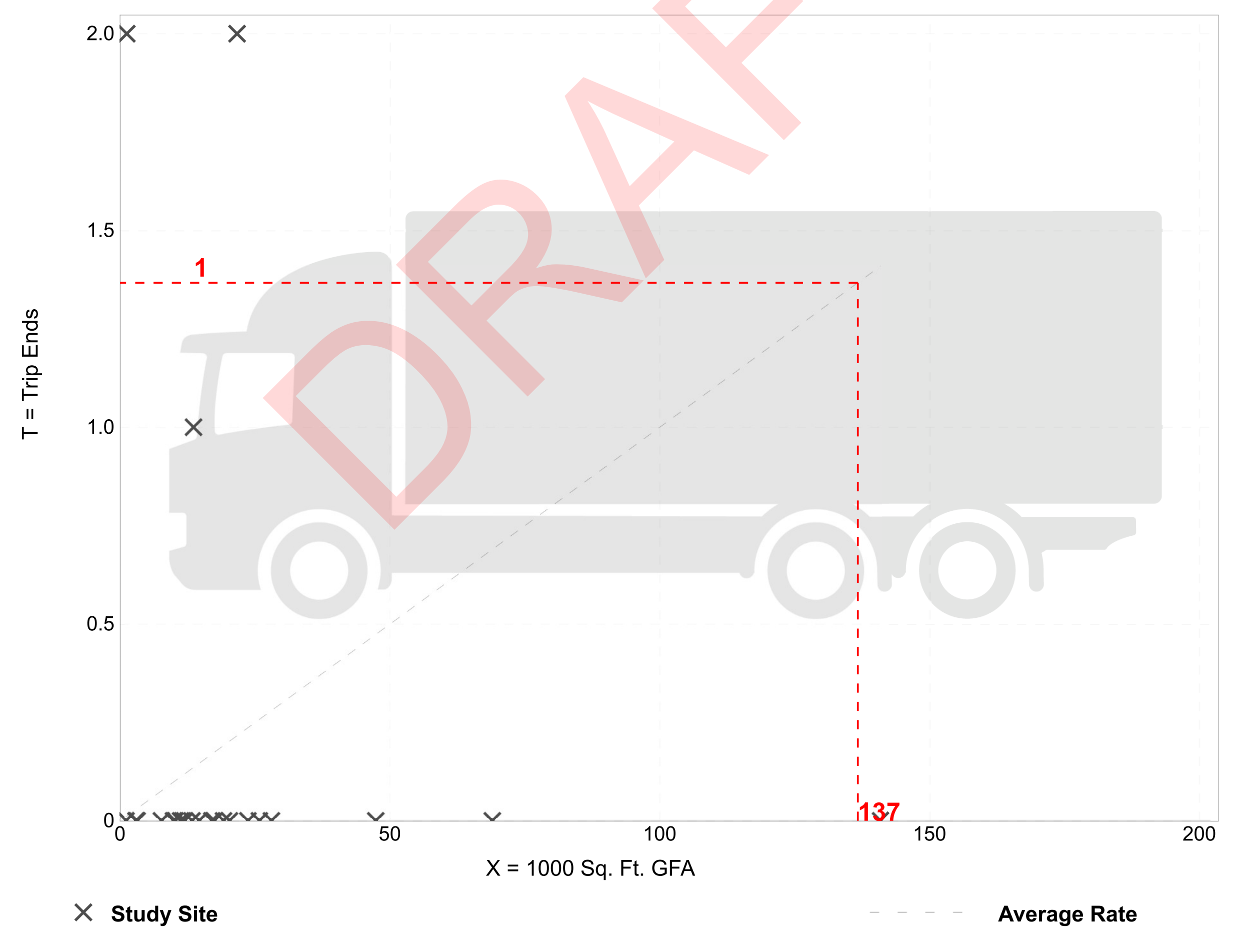
General Light Industrial
(110)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	25
Avg. 1000 Sq. Ft. GFA:	22
Directional Distribution:	60% entering, 40% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.01	0.00 - 1.59	0.08

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

Trip Gen Manual, 11th Edition • Institute of Transportation Engineers

General Light Industrial
(110)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	25
Avg. 1000 Sq. Ft. GFA:	21
Directional Distribution:	50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.01	0.00 - 0.15	0.03

Data Plot and Equation

Fitted Curve Equation: Not Given R^2= ****

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Land Use: 130
Industrial Park

Description

An industrial park contains several individual industrial or related facilities. It is characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities. Some parks in the database have a large number of small businesses and others have one or two dominant industries. General light industrial (Land Use 110) and manufacturing (Land Use 140) are related uses.

Additional Data

The sites were surveyed in the 1980s, the 2000s, 2010s, and the 2020s in California, Georgia, New Jersey, Massachusetts, New York, Ontario (CAN), and Pennsylvania.

Source Numbers

106, 162, 184, 251, 277, 422, 706, 747, 753, 937, 1032, 1070

Industrial Park
(130)

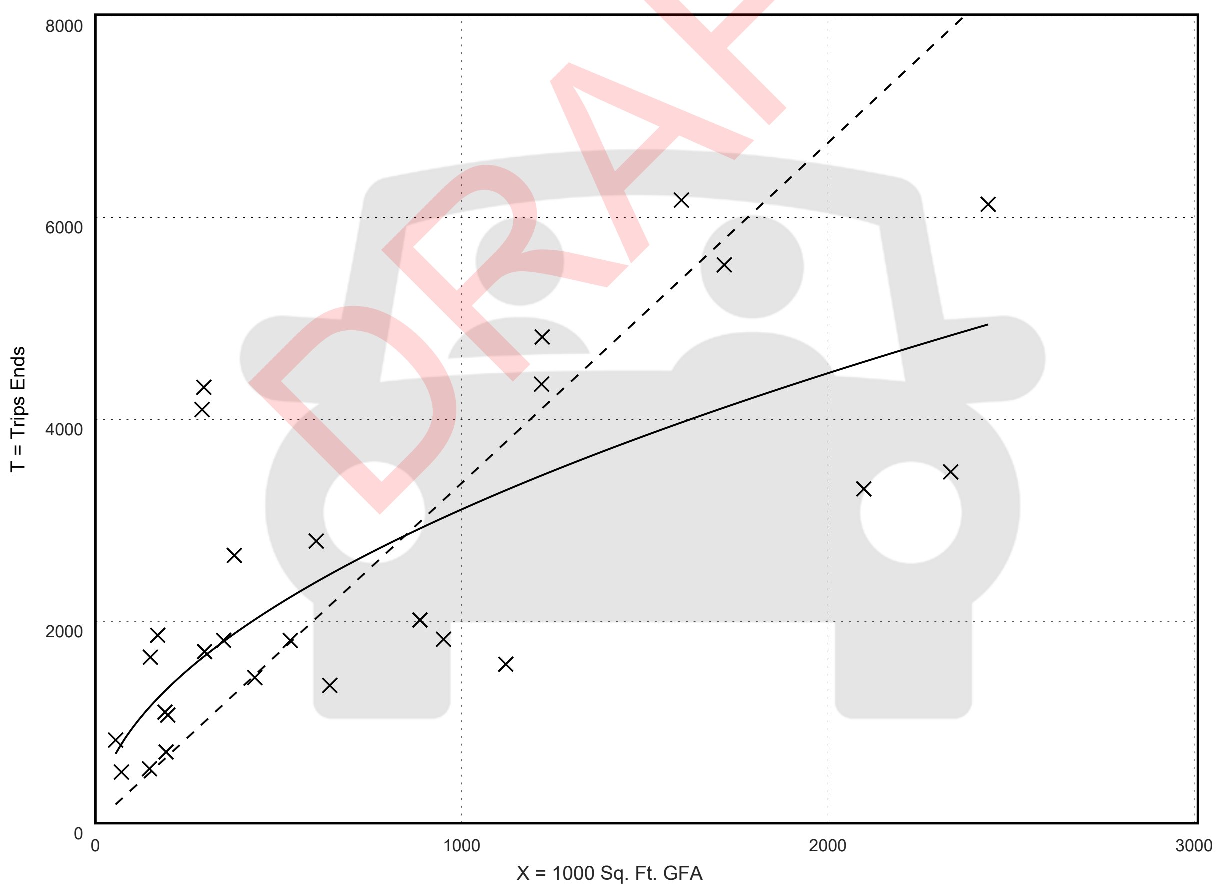
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 762
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.37	1.41 - 14.98	2.60

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: Ln(T) = 0.52 Ln(X) + 4.45 **R^2= 0.58**

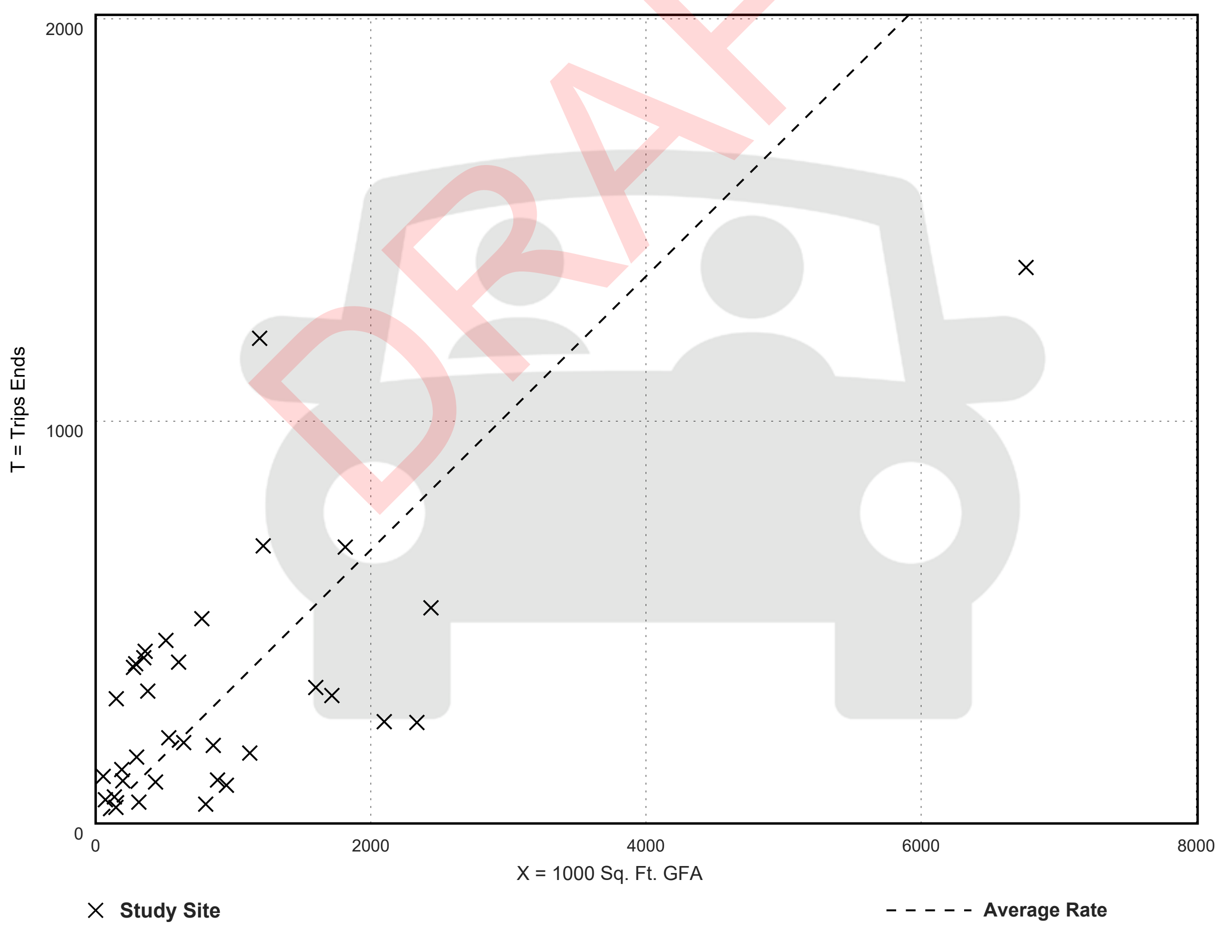
Industrial Park
(130)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	34
Avg. 1000 Sq. Ft. GFA:	956
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.06 - 2.13	0.33

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= *****

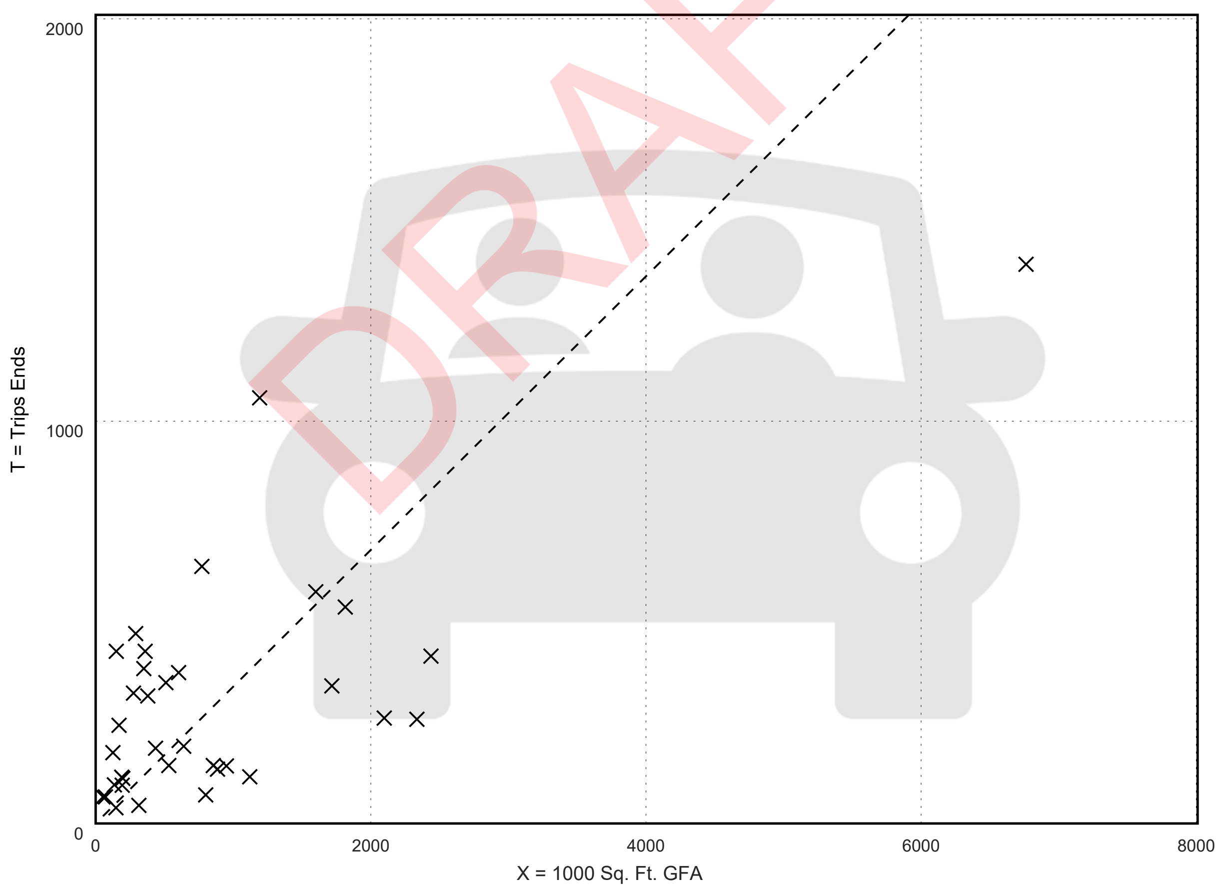
Industrial Park
(130)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	35
Avg. 1000 Sq. Ft. GFA:	899
Directional Distribution:	22% entering, 78% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.09 - 2.85	0.36

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

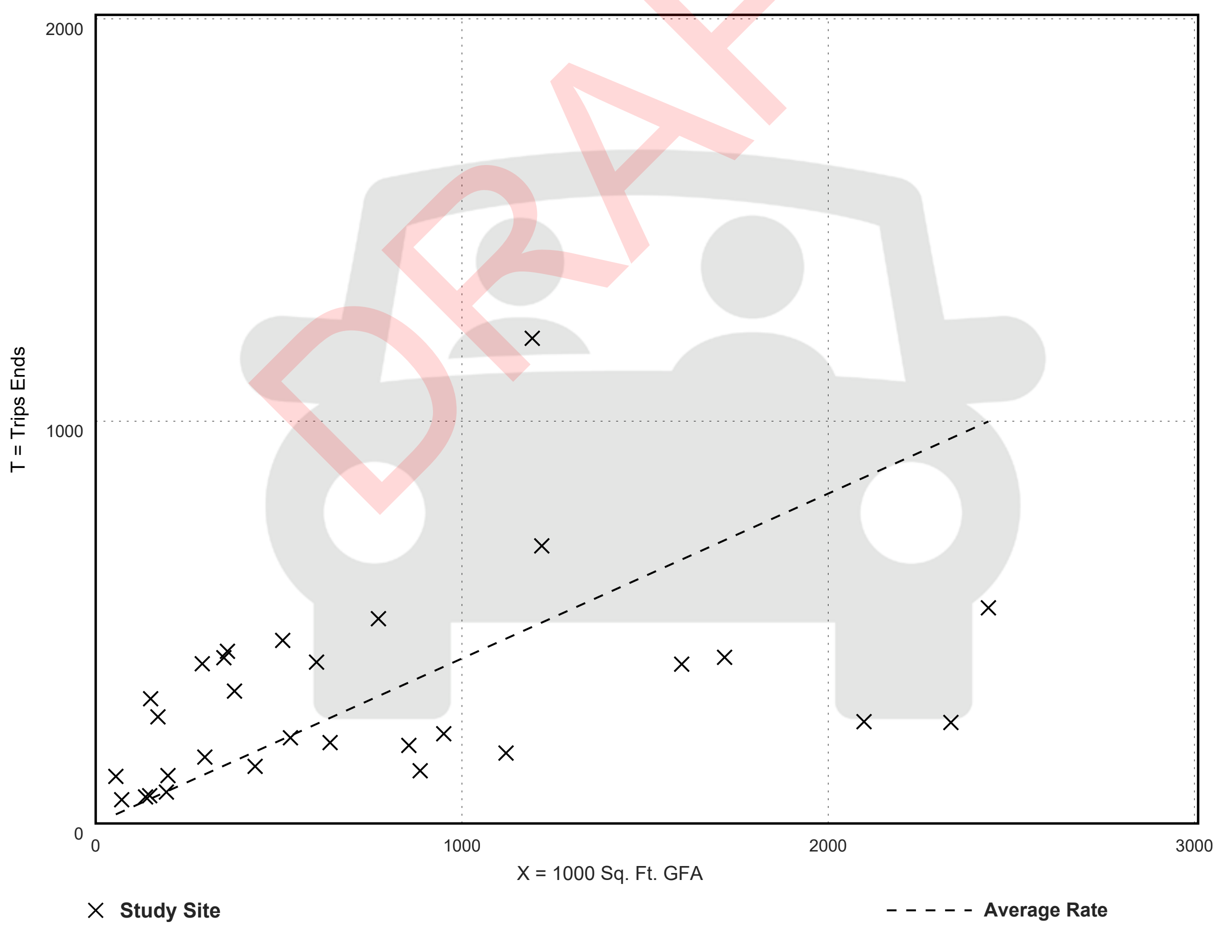
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 30
Avg. 1000 Sq. Ft. GFA: 757
Directional Distribution: 87% entering, 13% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.41	0.11 - 2.13	0.37

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Industrial Park
(130)

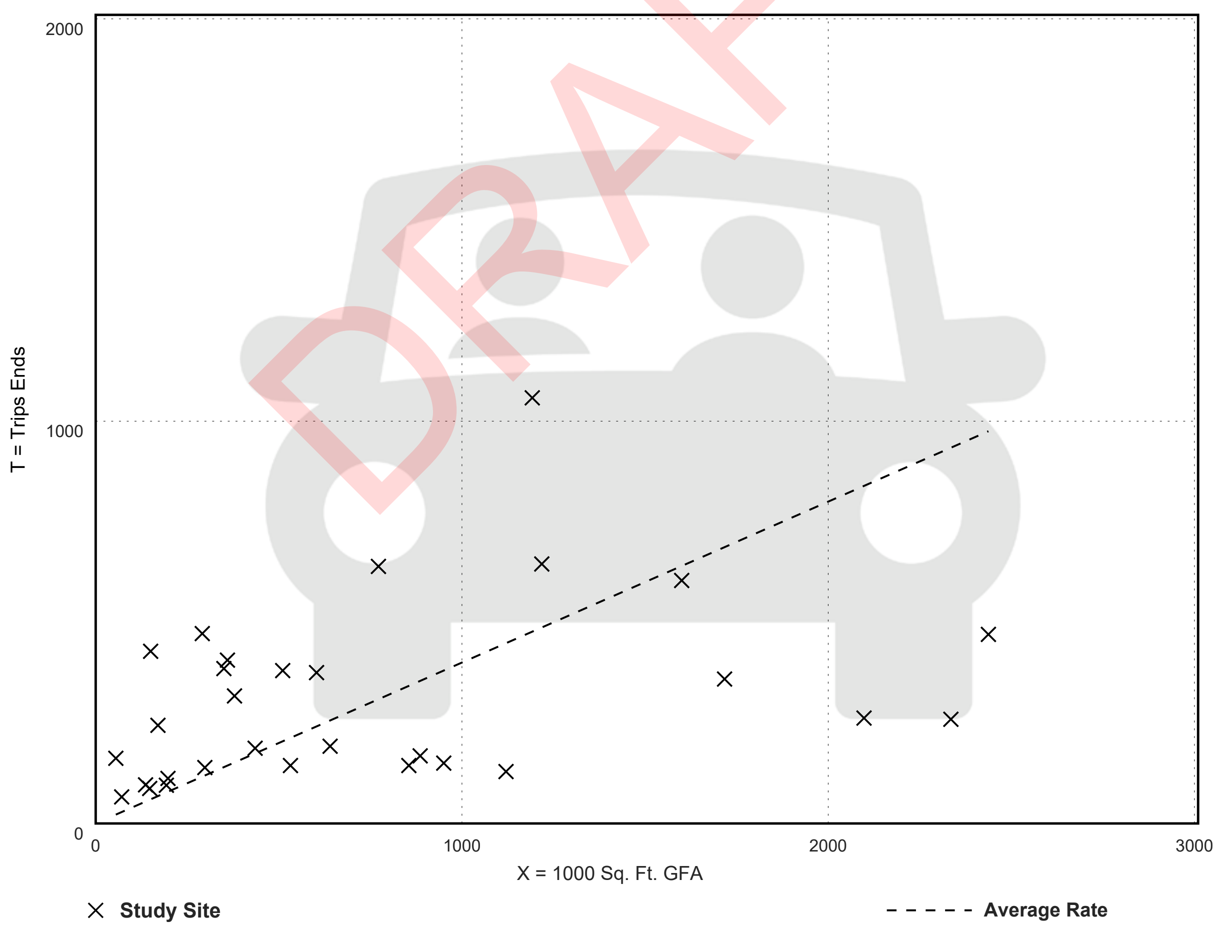
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 30
Avg. 1000 Sq. Ft. GFA: 757
Directional Distribution: 21% entering, 79% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.40	0.11 - 2.95	0.41

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

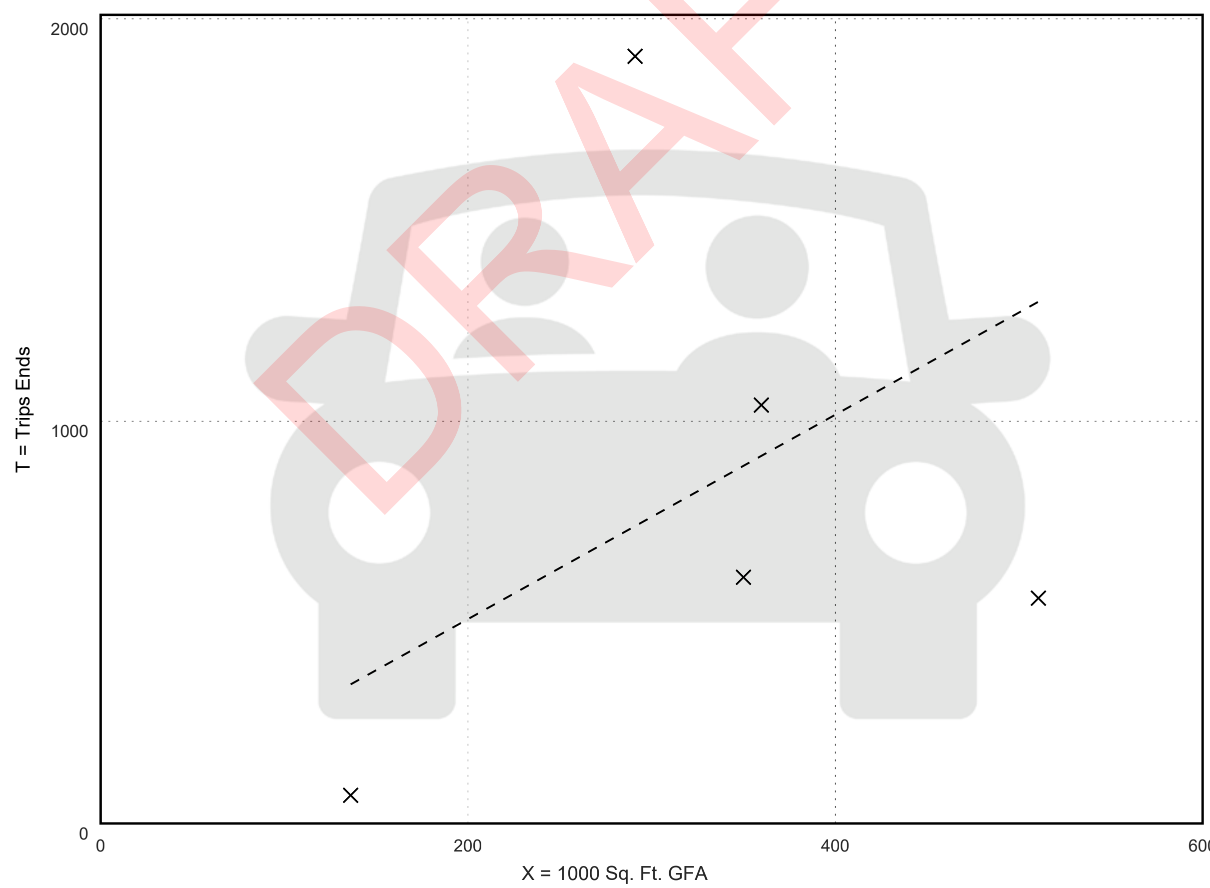
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 329
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.54	0.51 - 6.55	2.23

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

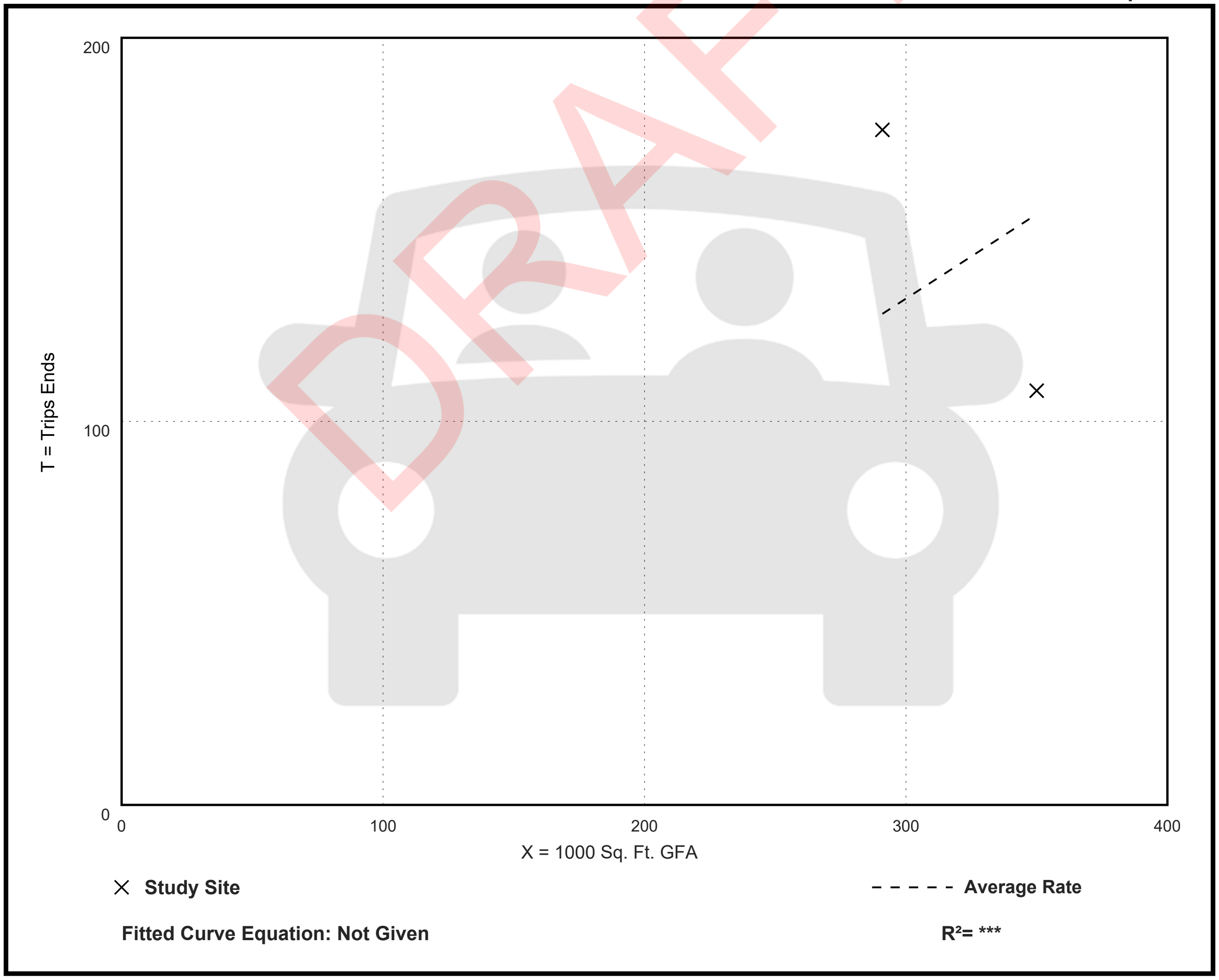
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 321
Directional Distribution: 32% entering, 68% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.44	0.31 - 0.60	***

Data Plot and Equation

Caution – Small Sample Size



Industrial Park
(130)

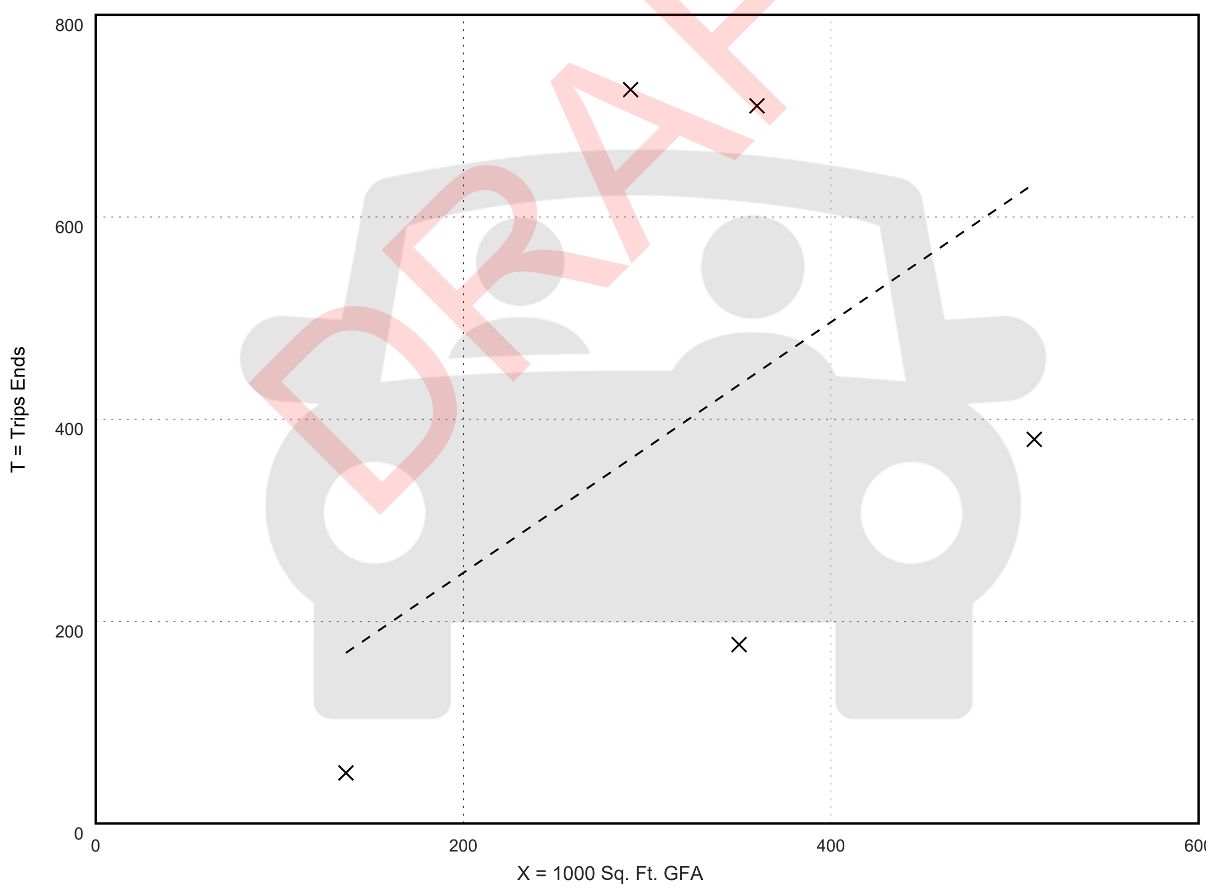
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 329
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.24	0.37 - 2.49	0.90

Data Plot and Equation



× **Study Site**
- - - - - **Average Rate**

Fitted Curve Equation: Not Given
R^2= *

Industrial Park
(130)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

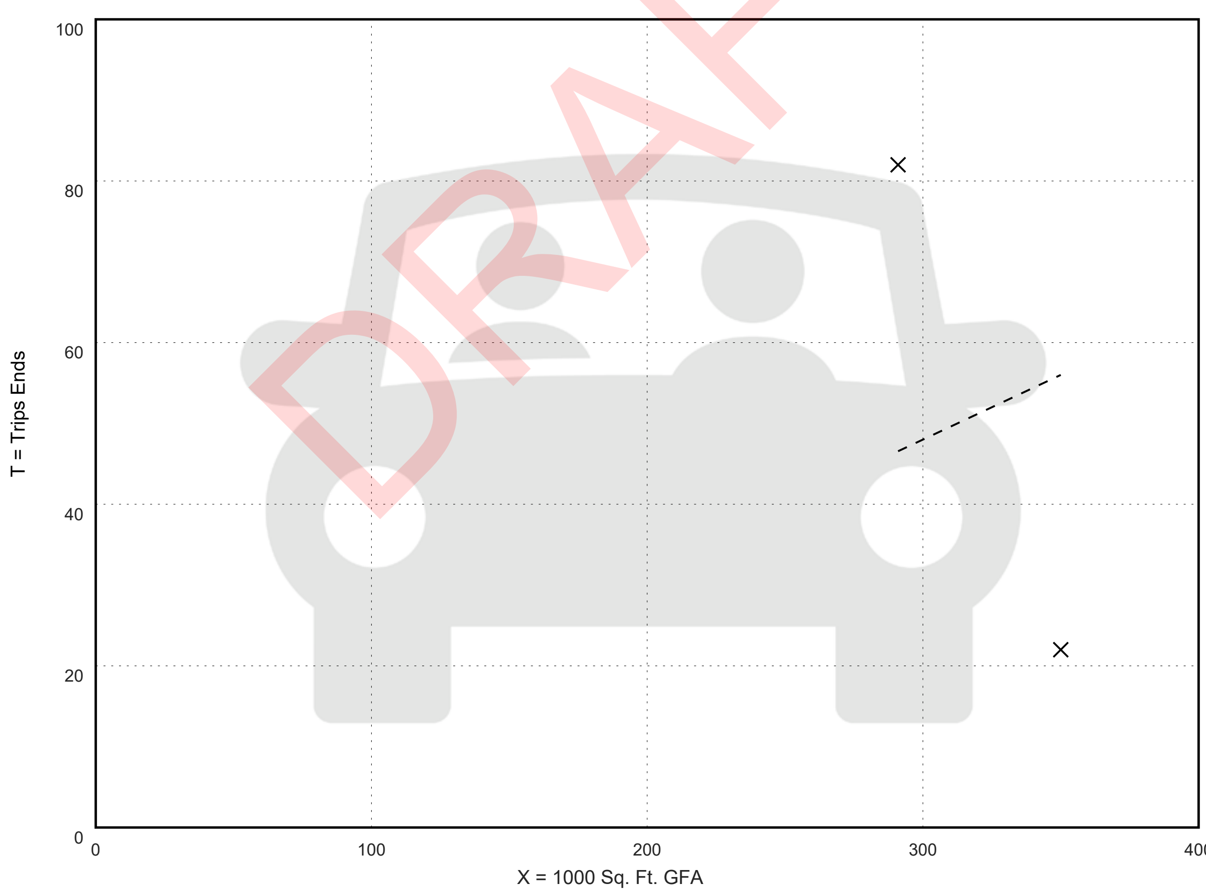
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 321
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.16	0.06 - 0.28	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

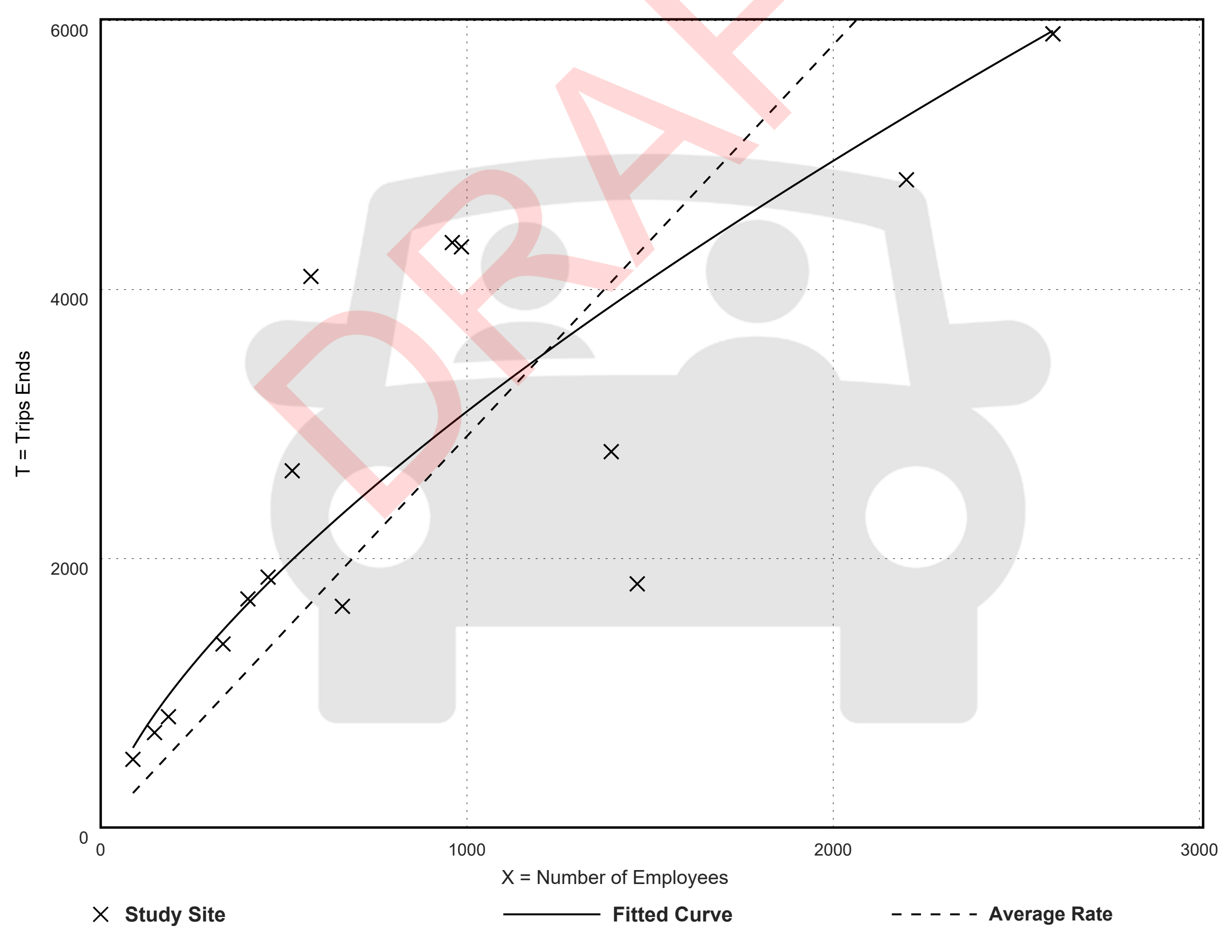
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 16
Avg. Num. of Employees: 973
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
2.91	1.24 - 7.14	1.42

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.68 Ln(X) + 3.34 **R^2= 0.81**

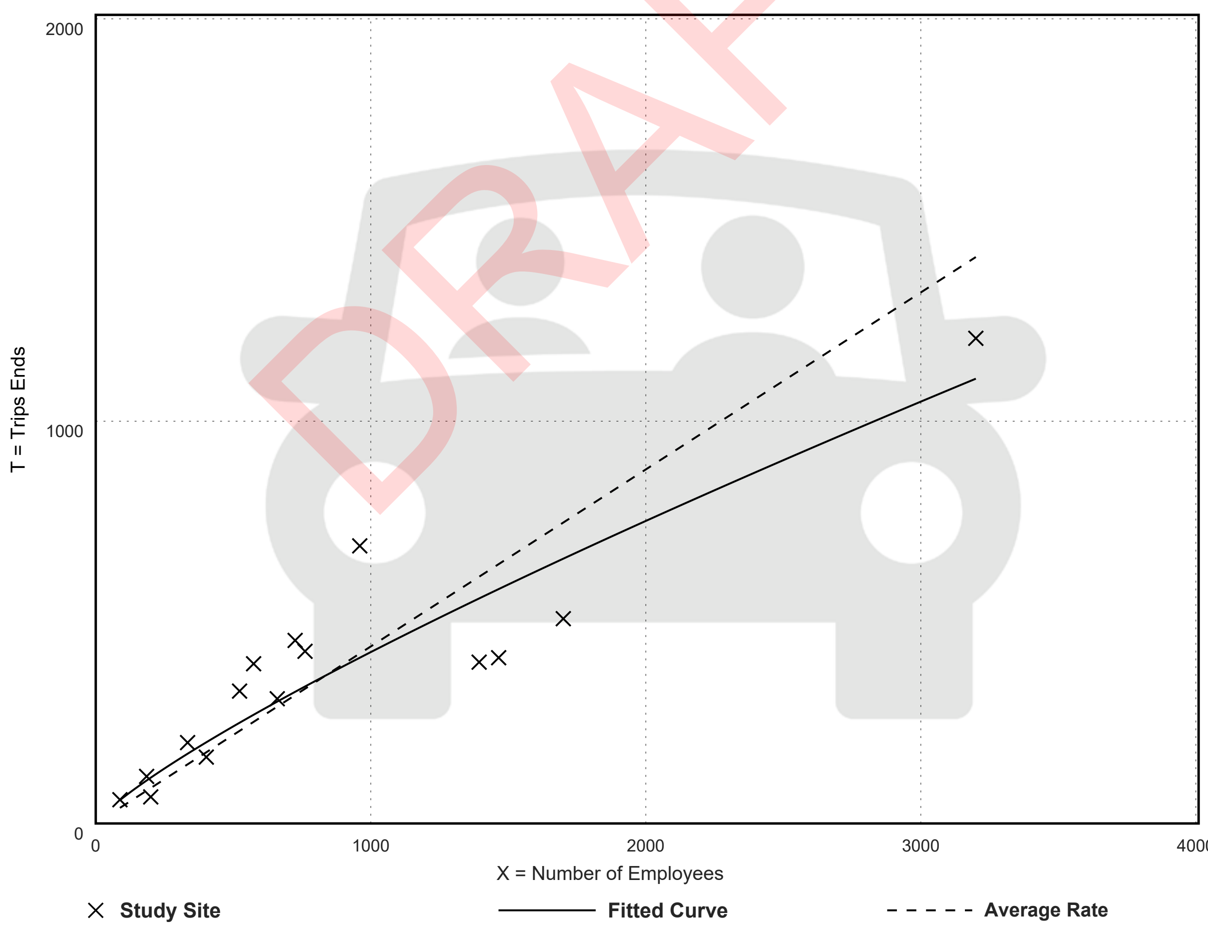
Industrial Park
(130)

Vehicle Trip Ends vs: **Employees**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 15
Avg. Num. of Employees: 878
Directional Distribution: 86% entering, 14% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.44	0.28 - 0.72	0.16

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.82 Ln(X) + 0.39 **R^2= 0.87**

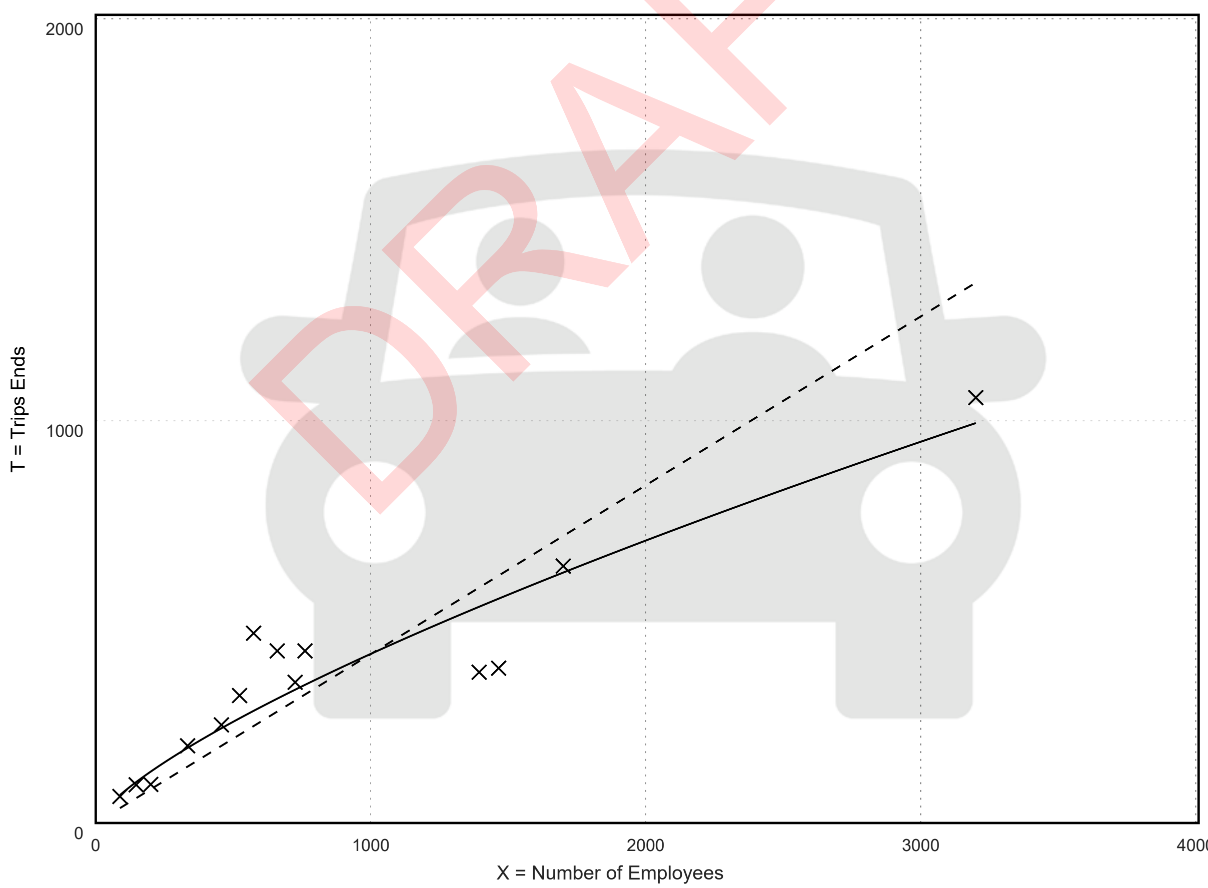
Industrial Park
(130)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Employees: 873
Directional Distribution: 20% entering, 80% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.42	0.26 - 0.82	0.16

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.74 Ln(X) + 0.93 **R^2= 0.90**

Industrial Park
(130)

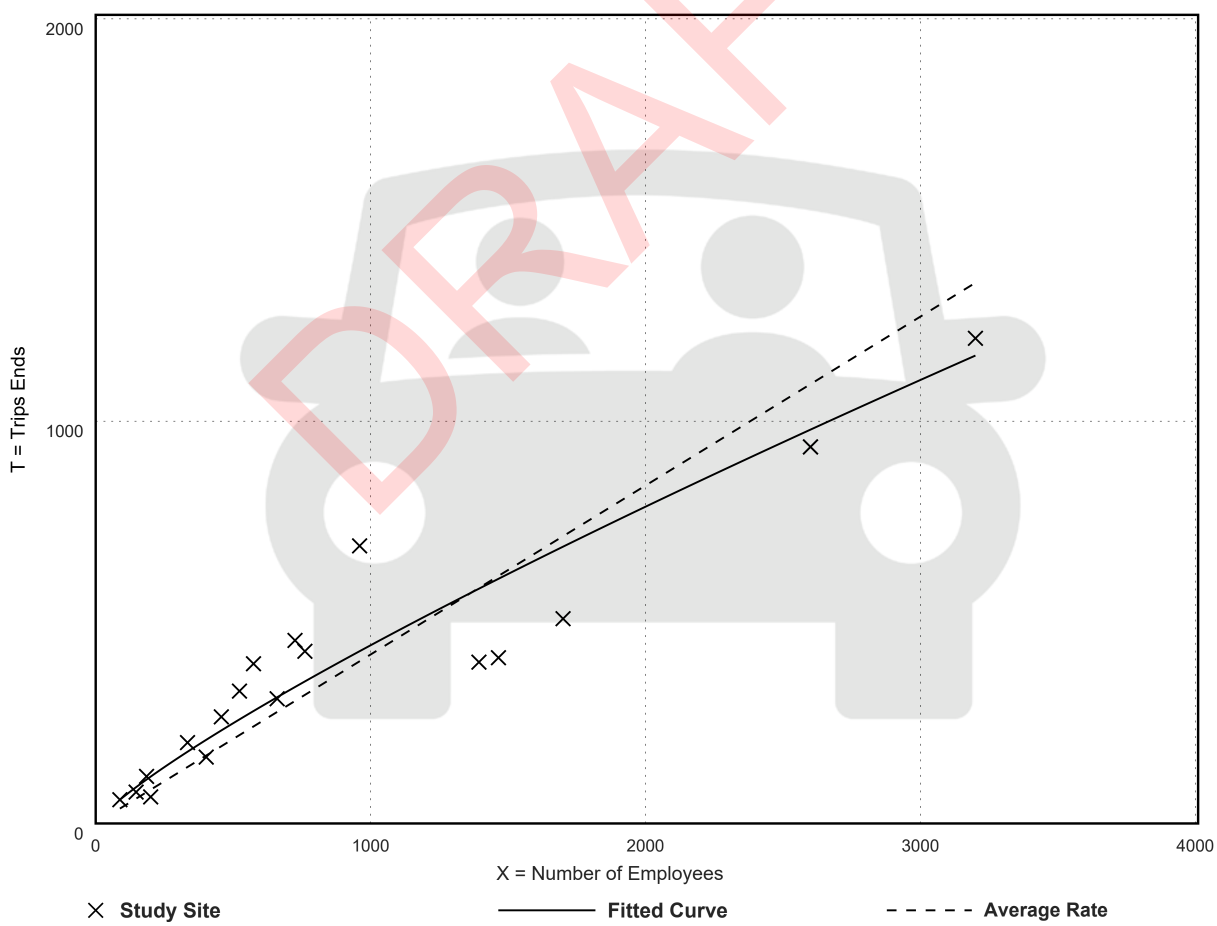
Vehicle Trip Ends vs: Employees
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 19
Avg. Num. of Employees: 999
Directional Distribution: 87% entering, 13% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.42	0.28 - 0.72	0.14

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.83 Ln(X) + 0.36 **R^2= 0.90**

Industrial Park
(130)

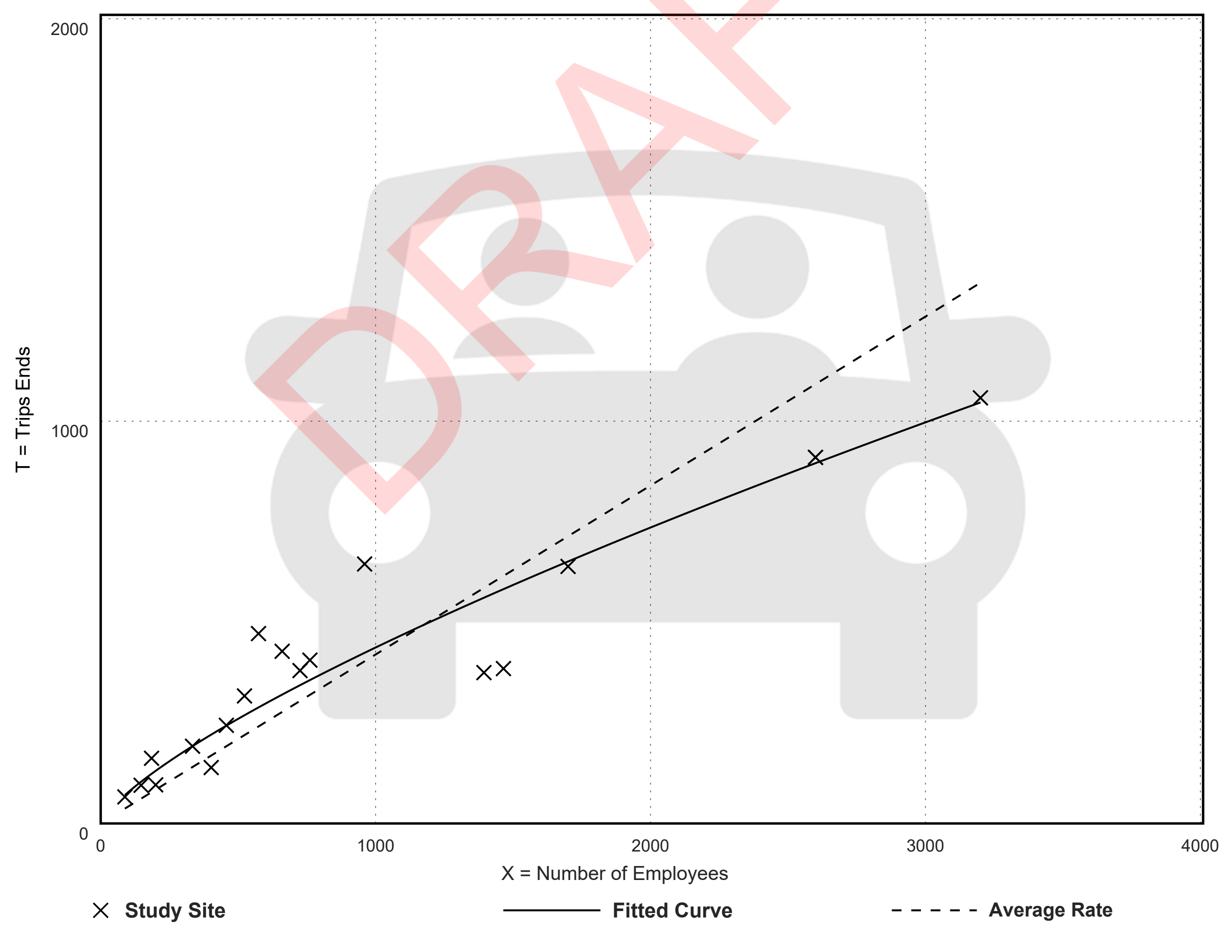
Vehicle Trip Ends vs: Employees
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 19
Avg. Num. of Employees: 999
Directional Distribution: 21% entering, 79% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.42	0.26 - 0.88	0.15

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.75 Ln(X) + 0.90 **R^2= 0.89**

Industrial Park
(130)

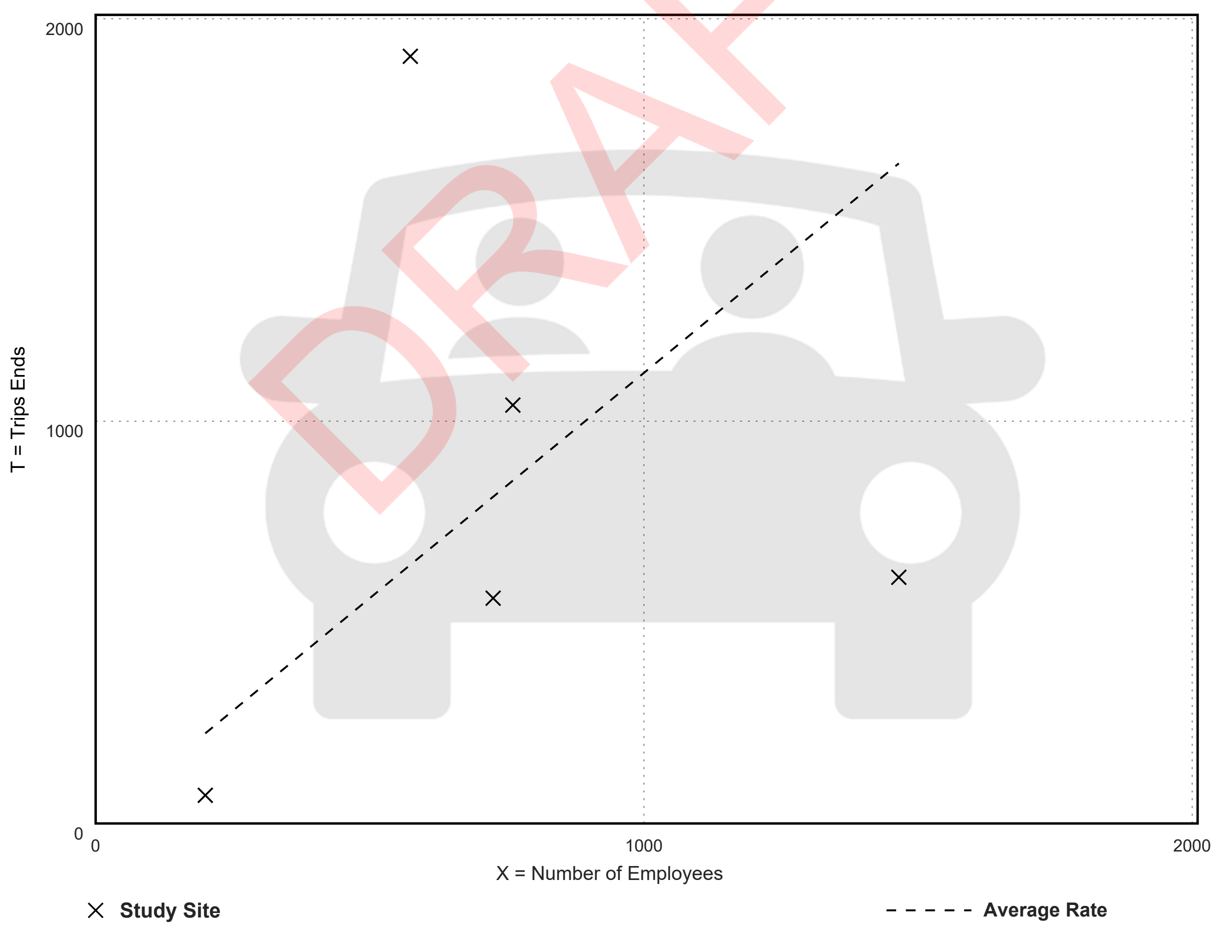
Vehicle Trip Ends vs: Employees
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 745
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.12	0.35 - 3.32	1.12

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Industrial Park
(130)

Vehicle Trip Ends vs: Employees
On a: Saturday, Peak Hour of Generator

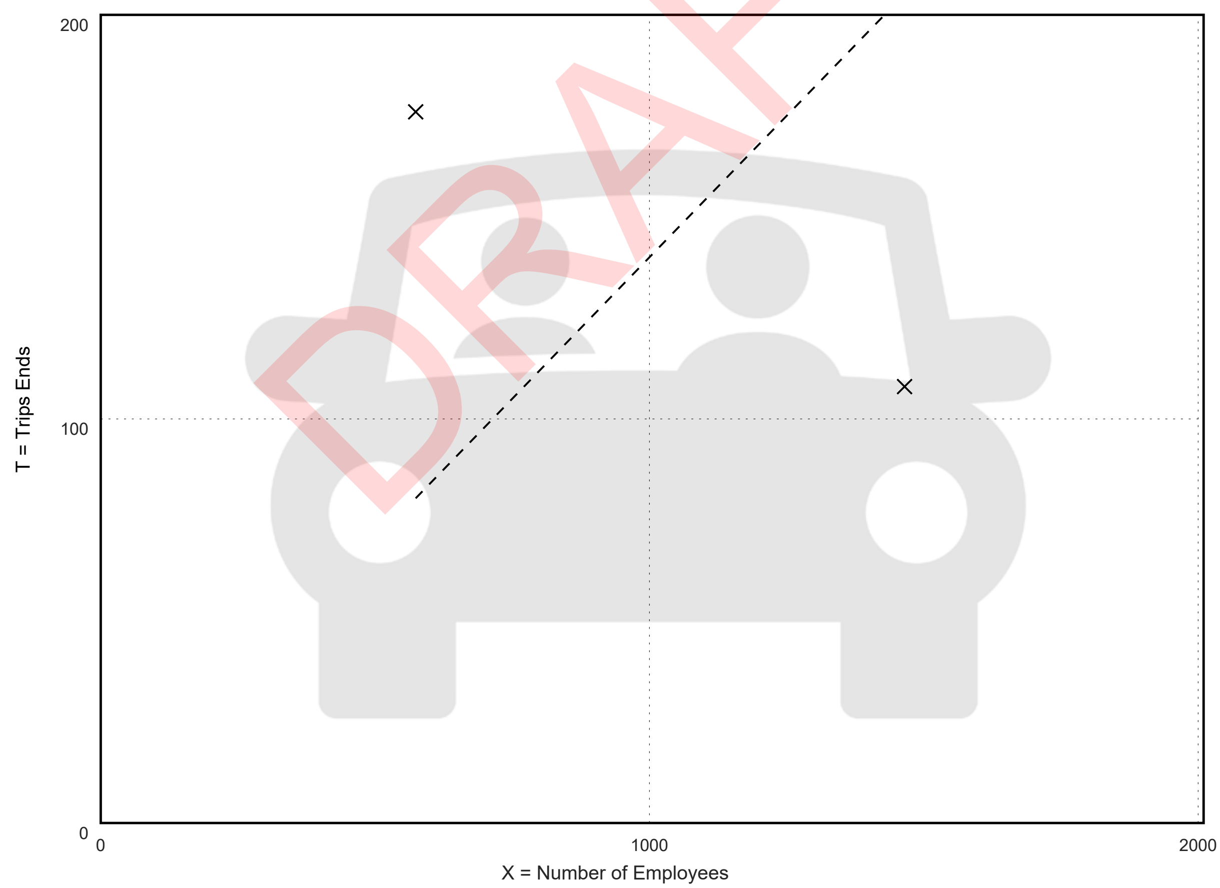
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Employees: 1020
Directional Distribution: 32% entering, 68% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.14	0.07 - 0.31	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= ***

Industrial Park
(130)

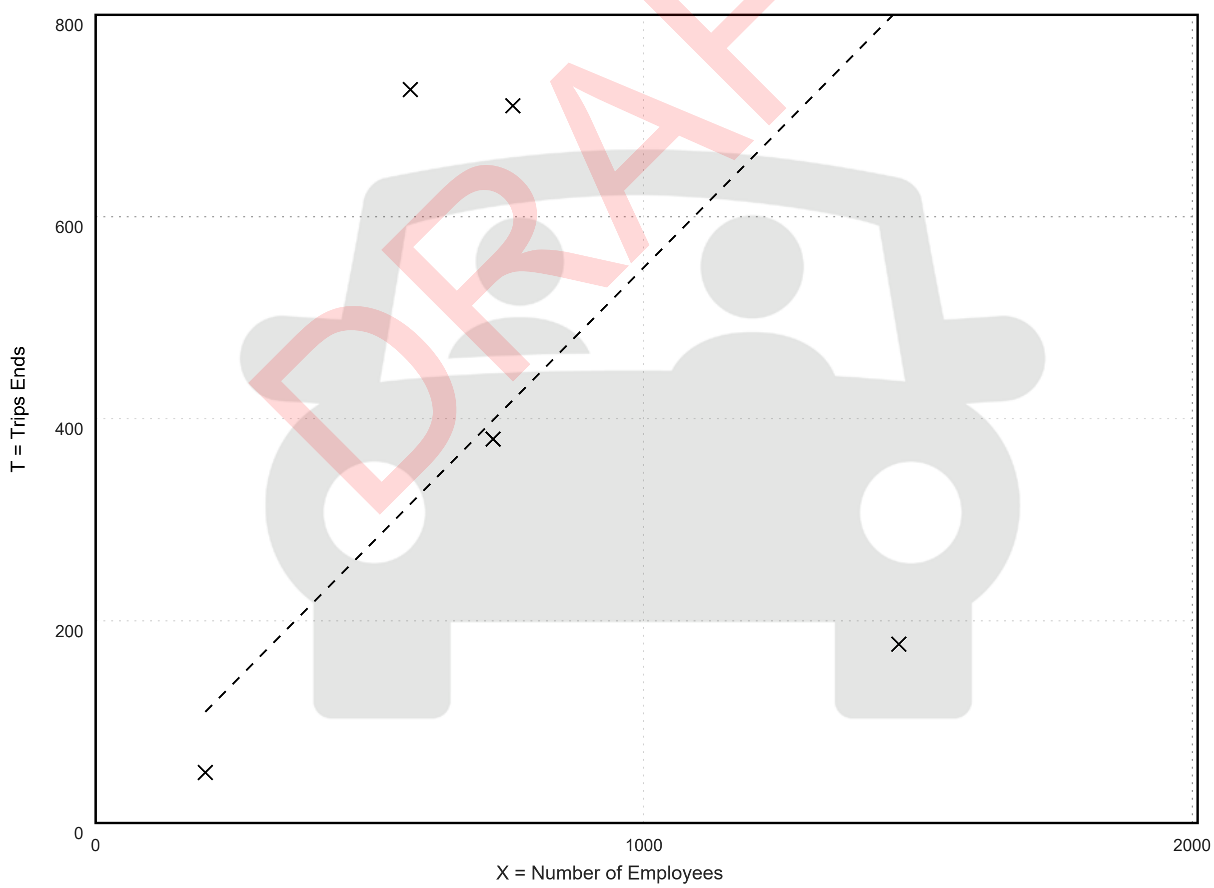
Vehicle Trip Ends vs: Employees
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 745
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.55	0.12 - 1.26	0.48

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

Vehicle Trip Ends vs: Employees
On a: Sunday, Peak Hour of Generator

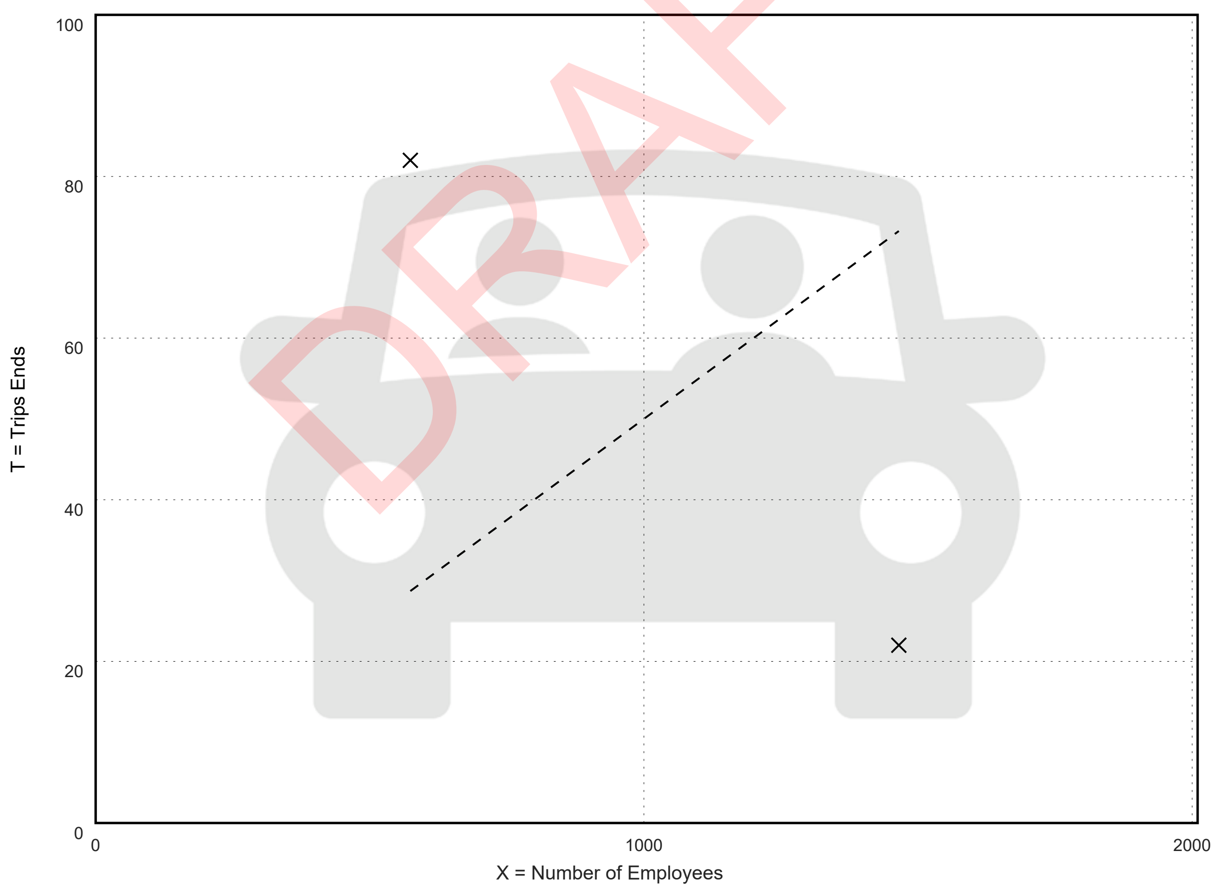
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Employees: 1020
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.05	0.02 - 0.14	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Industrial Park
(130)

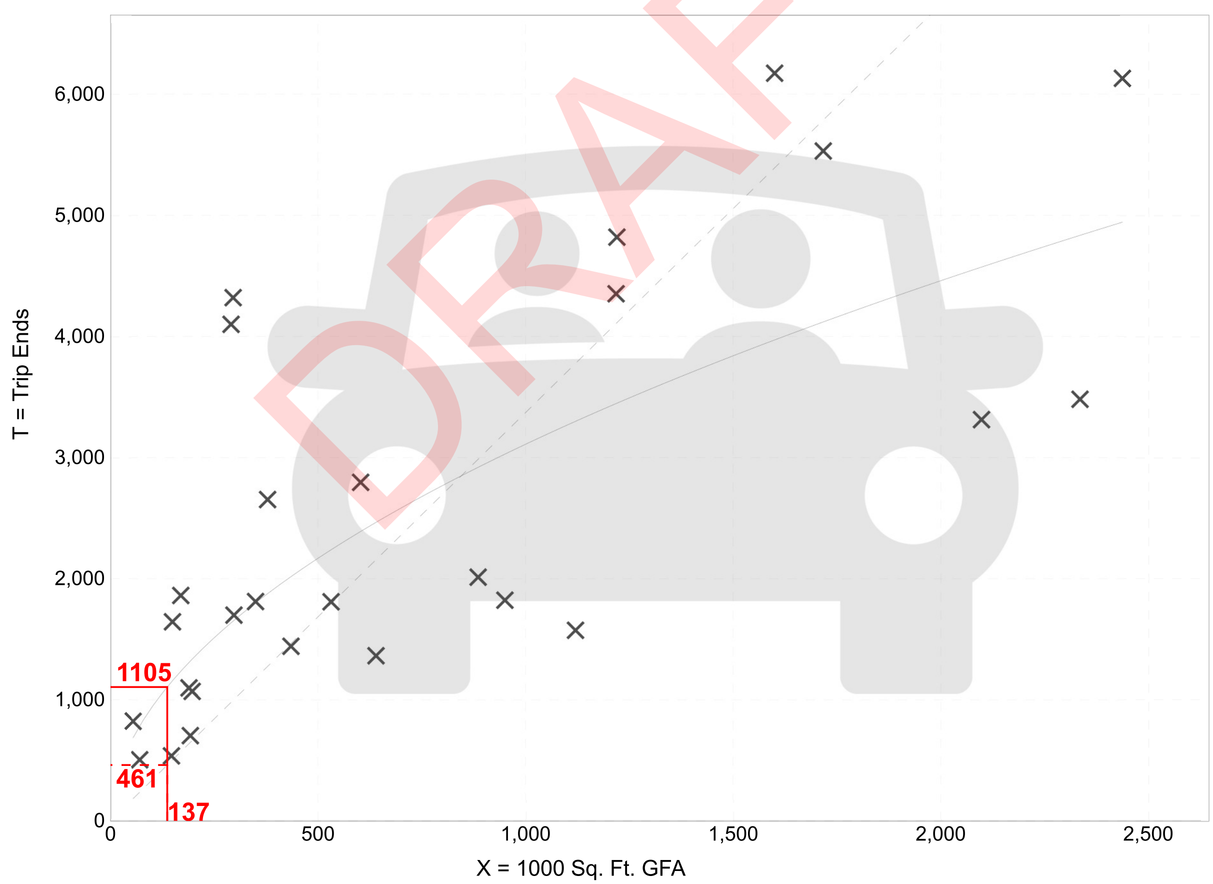
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 762
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.37	1.41 - 14.98	2.60

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: Ln(T) = 0.52 Ln(X) + 4.45 **R^2= 0.58**

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

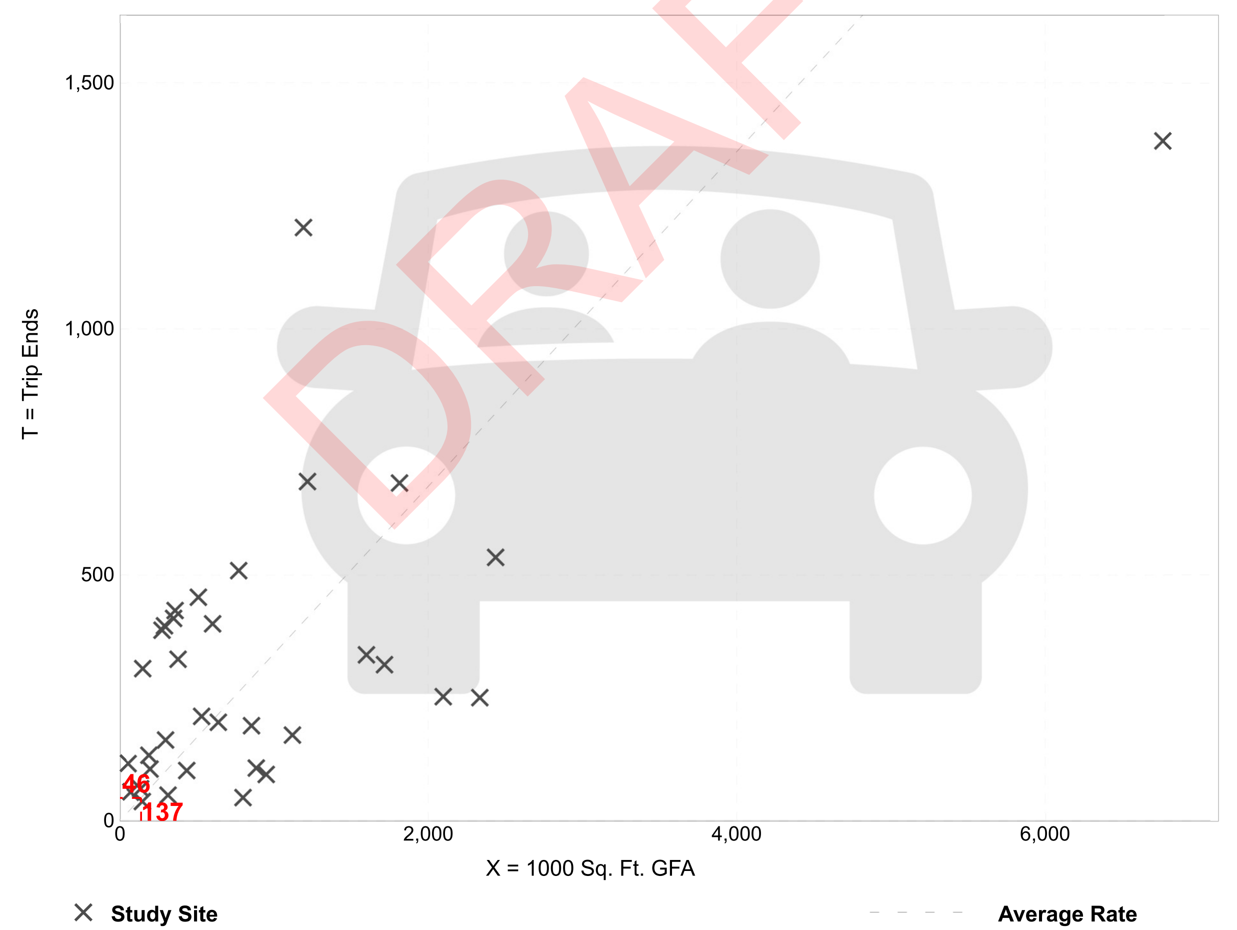
Industrial Park
(130)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	34
Avg. 1000 Sq. Ft. GFA:	956
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.06 - 2.13	0.33

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ****

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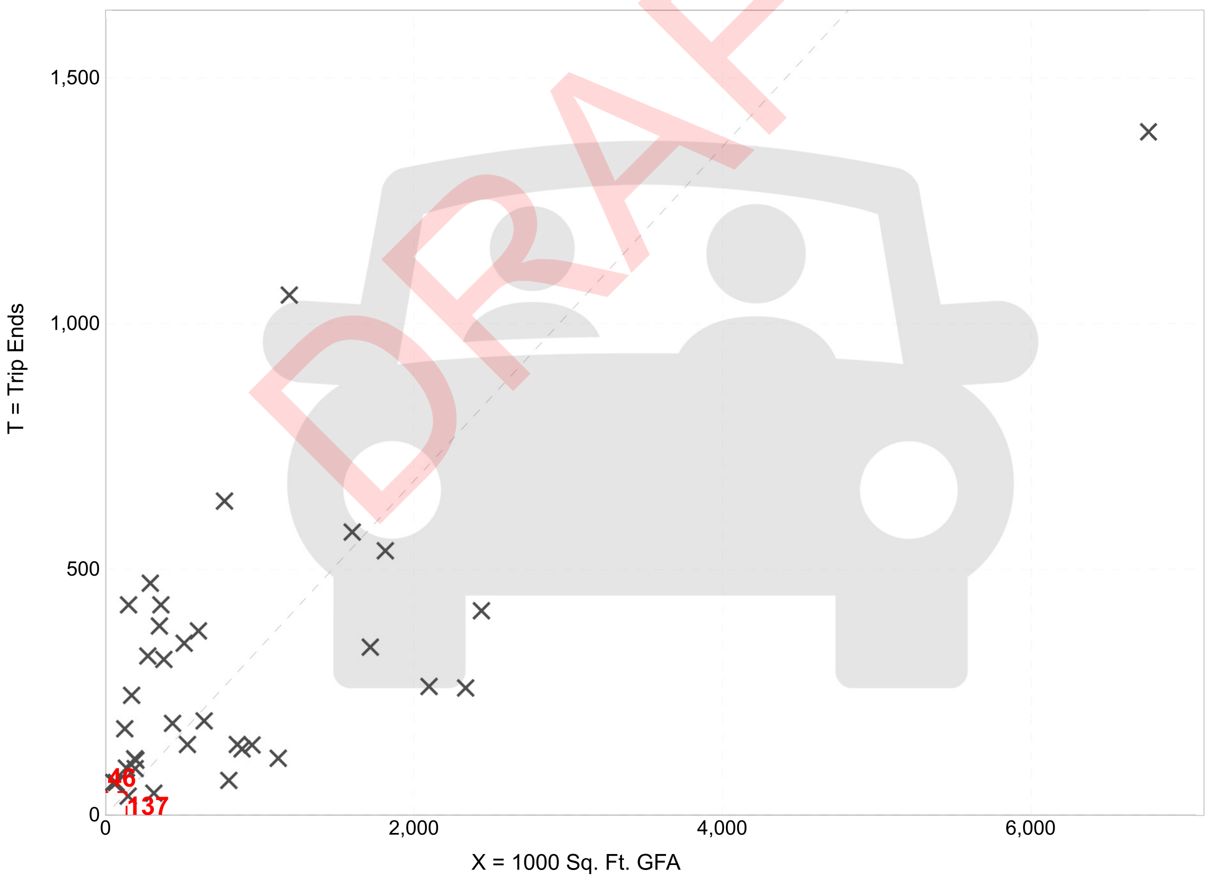
Industrial Park
(130)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	35
Avg. 1000 Sq. Ft. GFA:	899
Directional Distribution:	22% entering, 78% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.09 - 2.85	0.36

Data Plot and Equation



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Industrial Park
(130)

Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

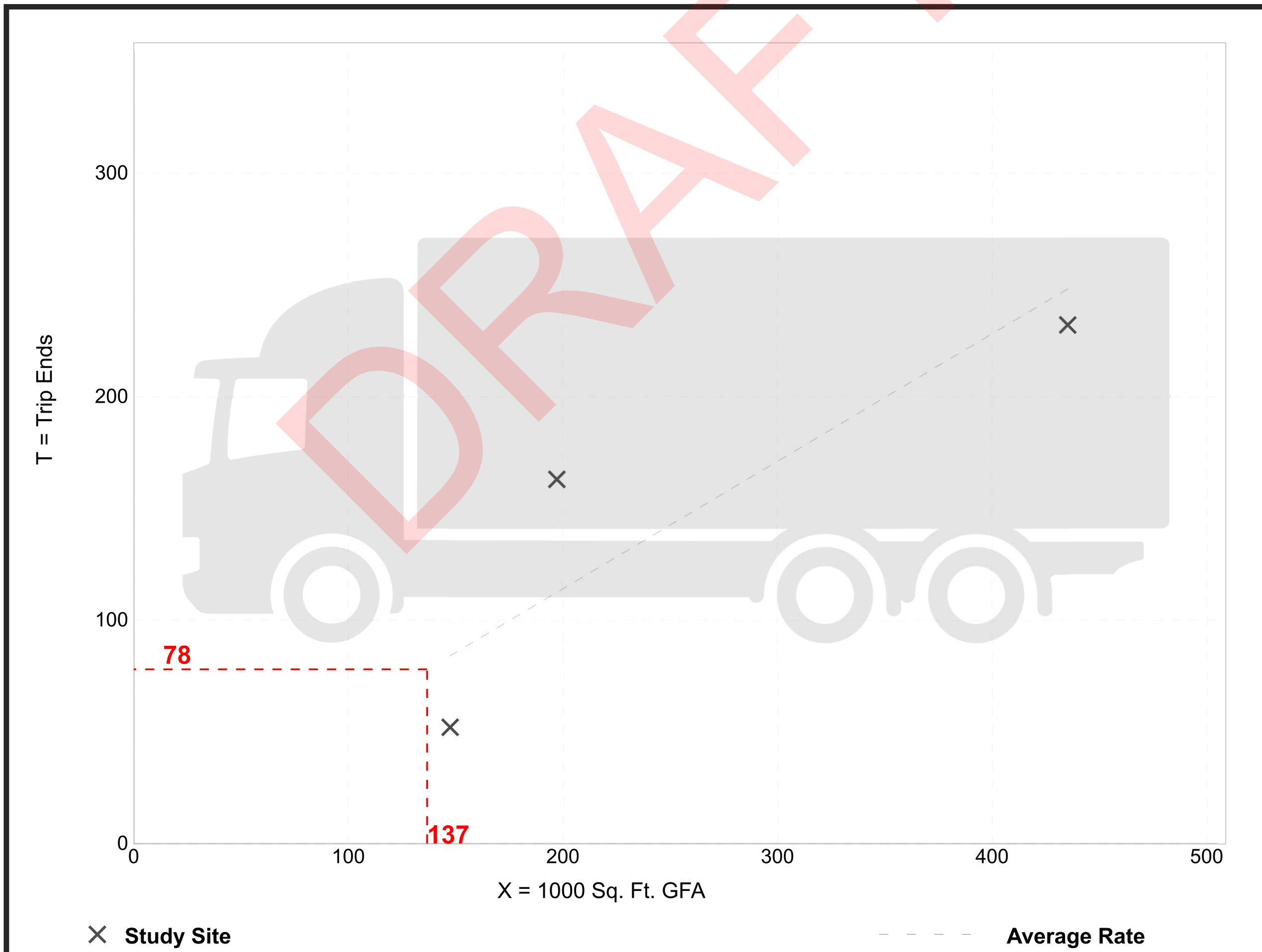
Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 260
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.57	0.35 - 0.83	0.20

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ****

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Industrial Park
(130)

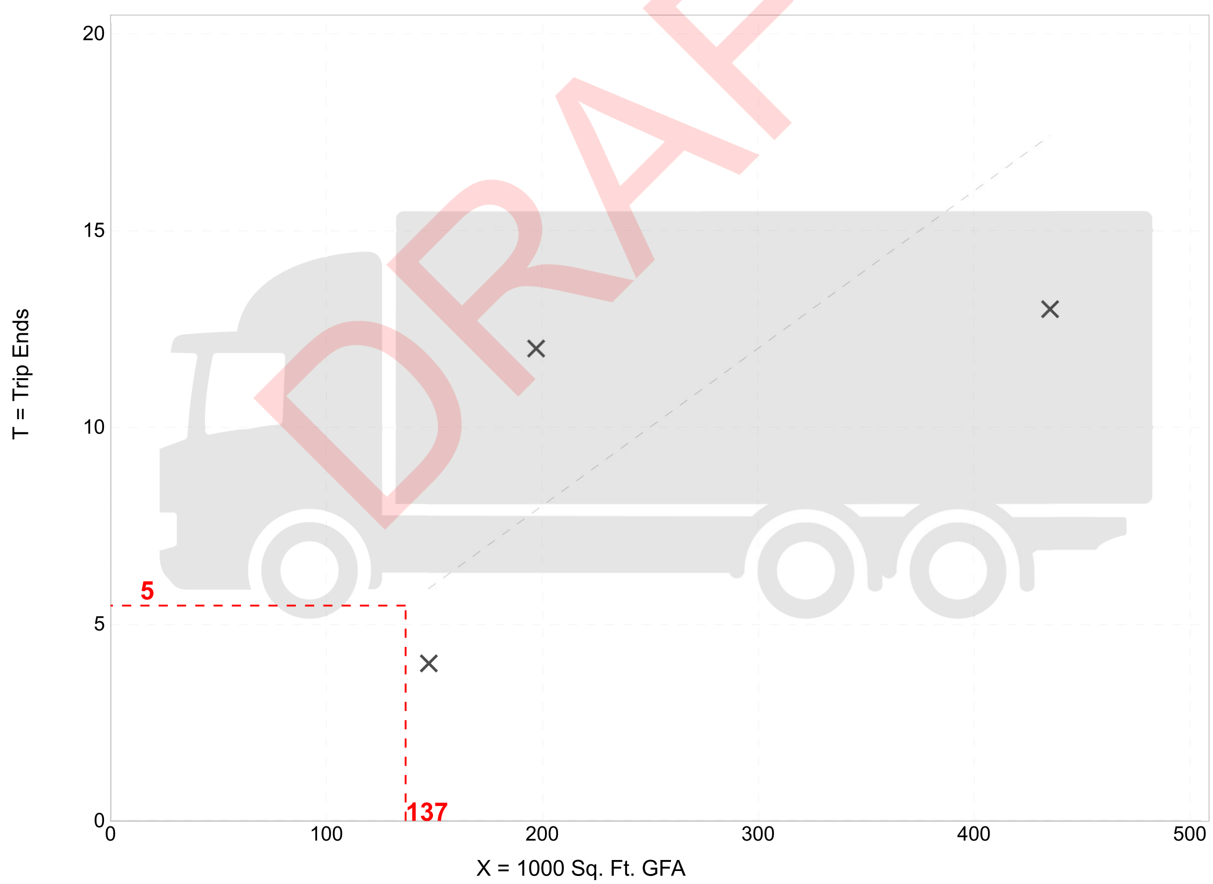
Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	3
Avg. 1000 Sq. Ft. GFA:	260
Directional Distribution:	45% entering, 55% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.04	0.03 - 0.06	0.02

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Industrial Park
(130)

Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 260
Directional Distribution: 38% entering, 62% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.04	0.01 - 0.07	0.03

Data Plot and Equation

Caution – Small Sample Size

× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Land Use: 140
Manufacturing

Description

A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, a manufacturing facility typically has an office and may provide space for warehouse, research, and associated functions. General light industrial (Land Use 110) and industrial park (Land Use 130) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Minnesota, Missouri, New Jersey, New York, Oregon, Pennsylvania, South Dakota, Texas, Vermont, Washington, and West Virginia.

Source Numbers

177, 179, 184, 241, 357, 384, 418, 443, 583, 598, 611, 728, 747, 875, 879, 940, 969, 1067, 1068, 1082

Manufacturing
(140)

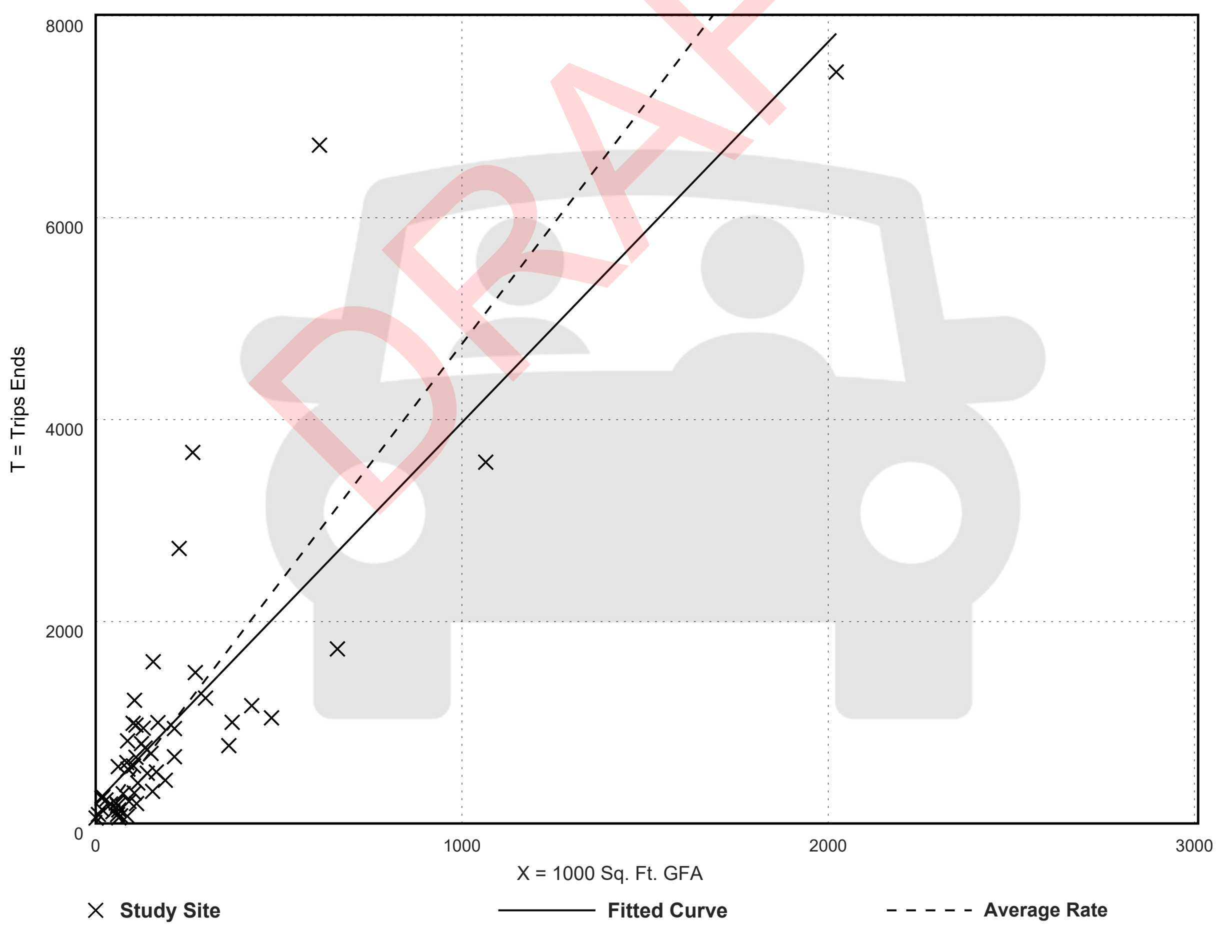
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 53
Avg. 1000 Sq. Ft. GFA: 208
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.75	0.83 - 49.50	3.20

Data Plot and Equation



Fitted Curve Equation: $T = 3.77(X) + 201.98$ **$R^2 = 0.68$**

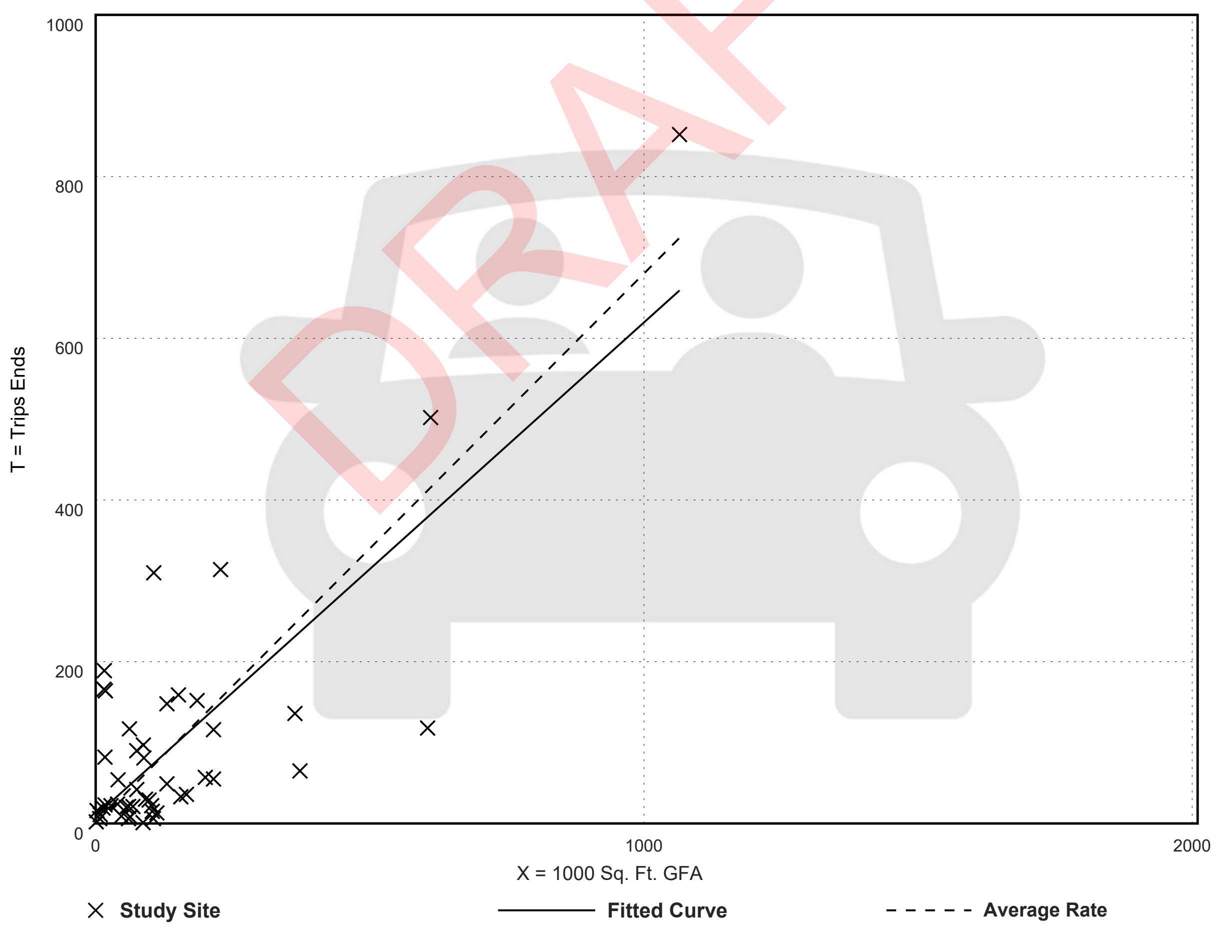
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 48
Avg. 1000 Sq. Ft. GFA: 138
Directional Distribution: 76% entering, 24% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.68	0.01 - 11.93	1.03

Data Plot and Equation



Fitted Curve Equation: T = 0.61(X) + 9.54 **R^2= 0.62**

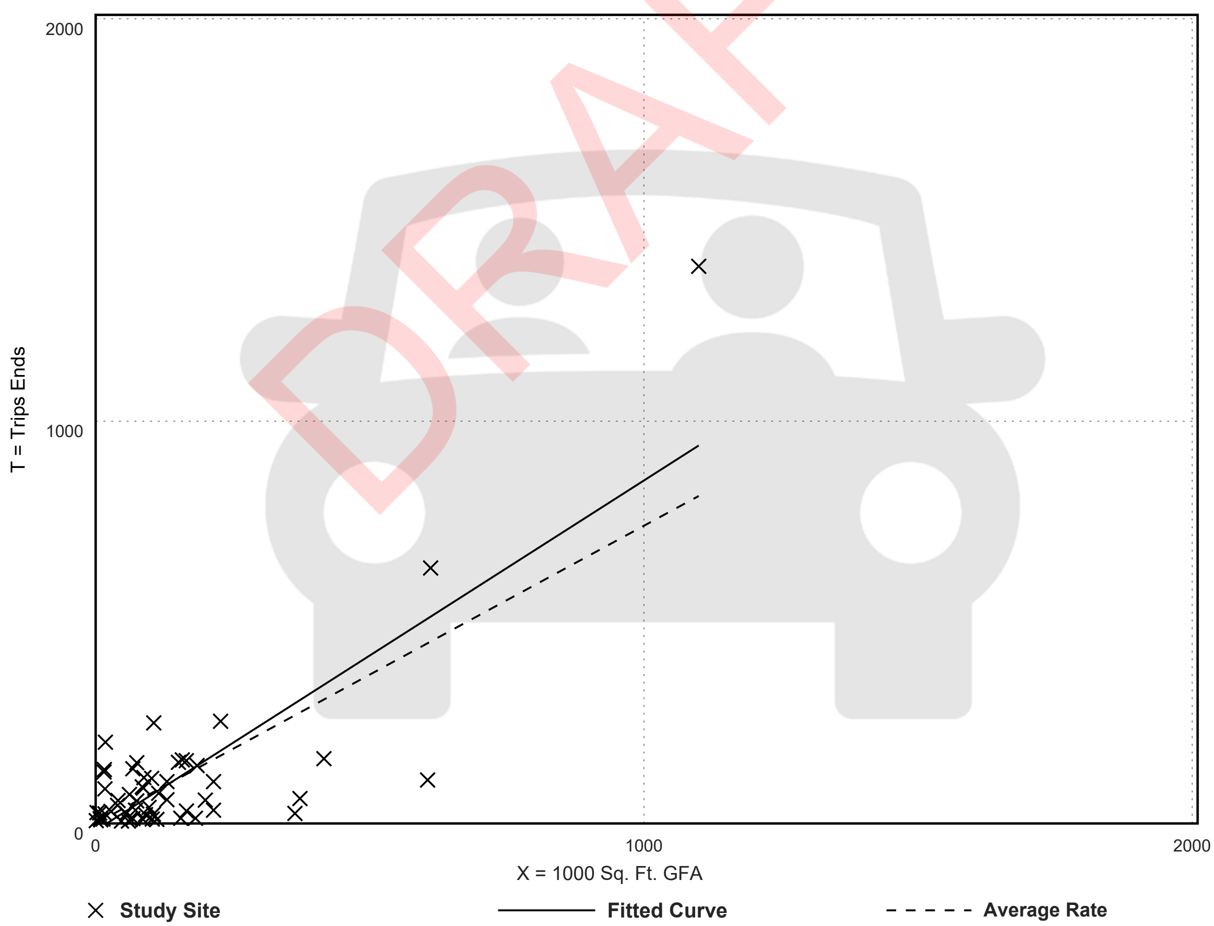
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 55
Avg. 1000 Sq. Ft. GFA: 142
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.07 - 11.37	0.93

Data Plot and Equation



Fitted Curve Equation: T = 0.87(X) - 17.50 **R^2= 0.64**

Manufacturing
(140)

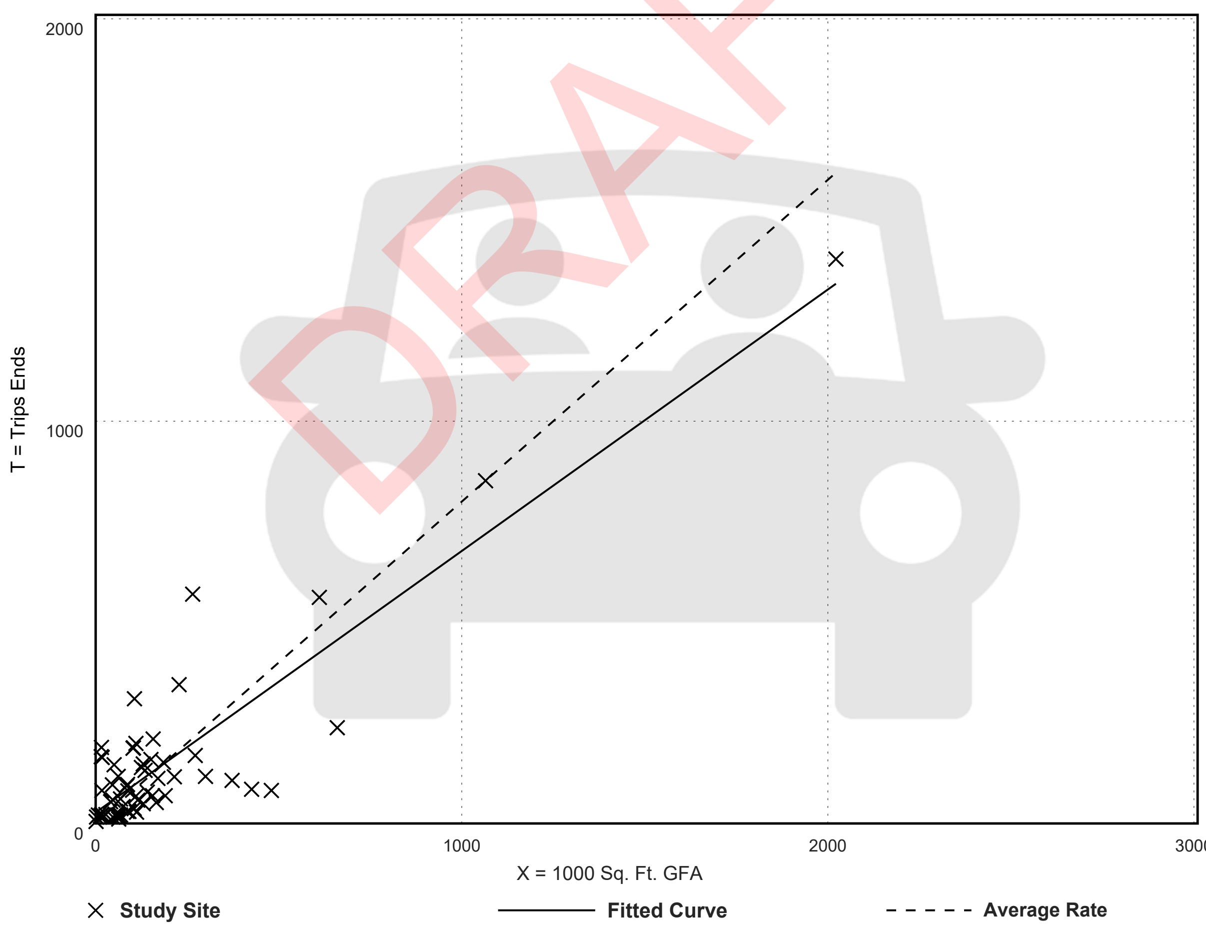
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 62
Avg. 1000 Sq. Ft. GFA: 178
Directional Distribution: 73% entering, 27% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.80	0.17 - 11.93	0.87

Data Plot and Equation



Fitted Curve Equation: $T = 0.65(X) + 27.27$

$R^2 = 0.79$

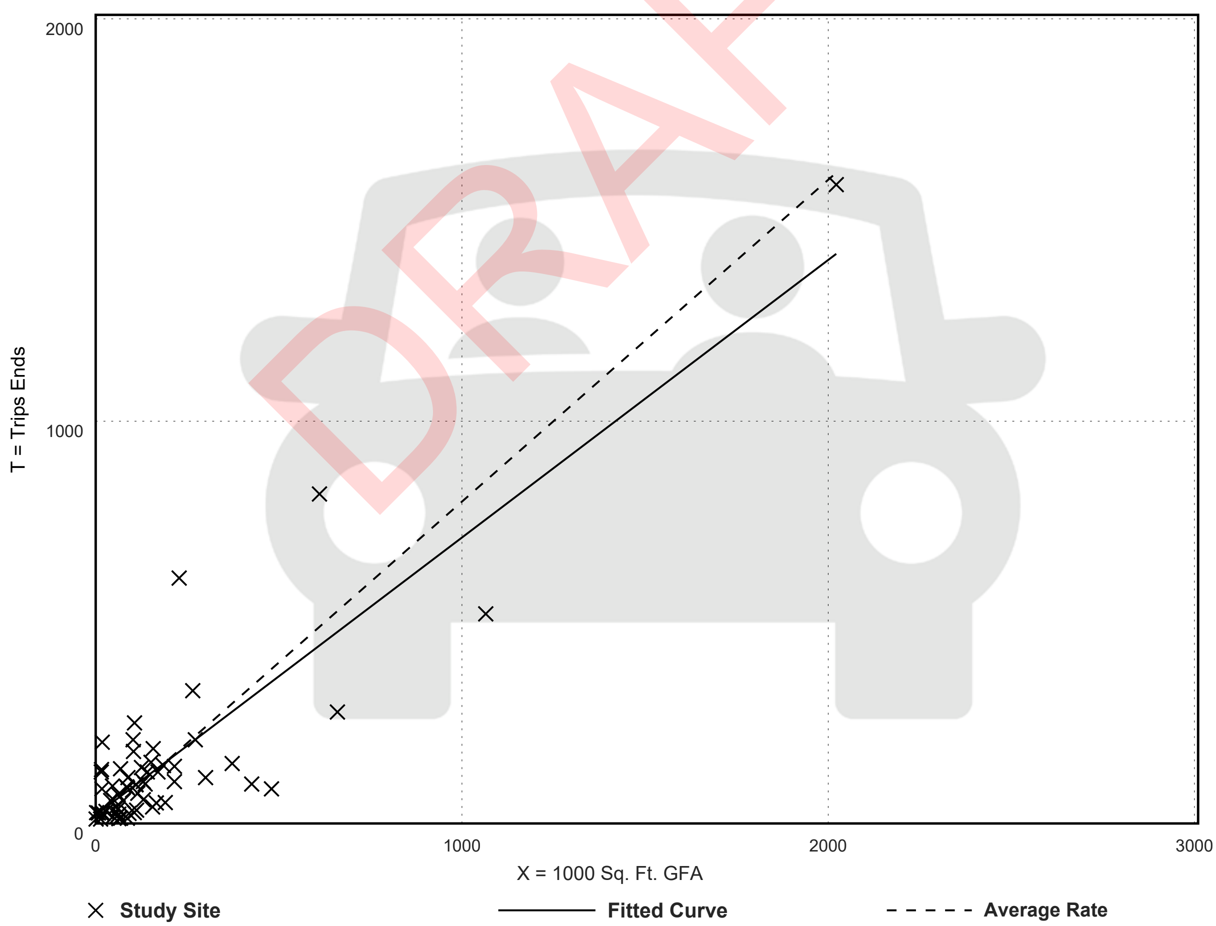
Manufacturing
(140)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	PM Peak Hour of Generator
Setting/Location:	**General Urban/Suburban**
Number of Studies:	62
Avg. 1000 Sq. Ft. GFA:	180
Directional Distribution:	42% entering, 58% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.80	0.15 - 11.37	0.82

Data Plot and Equation



Fitted Curve Equation: T = 0.69(X) + 20.74

R^2= 0.76

Manufacturing
(140)

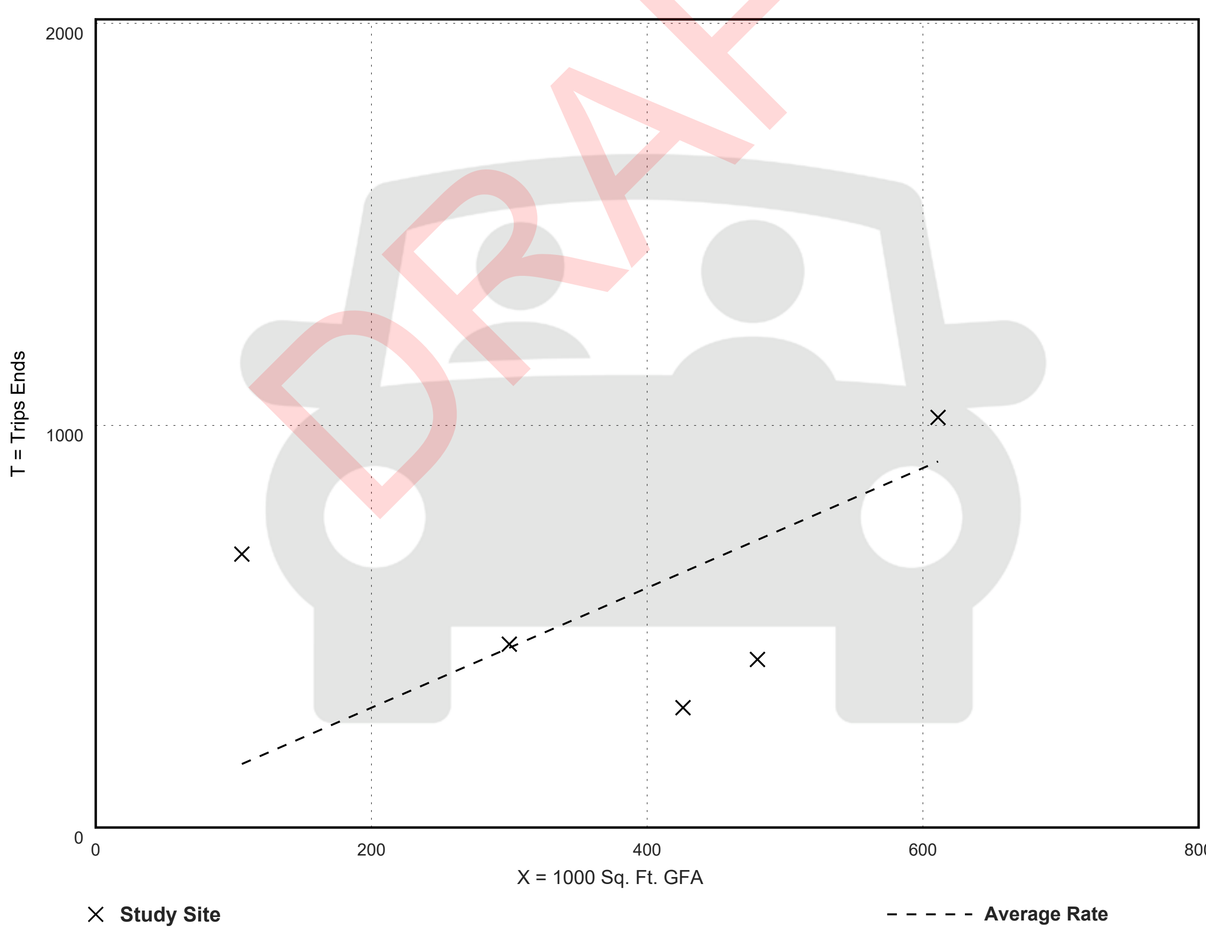
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 385
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.49	0.70 - 6.42	1.41

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Manufacturing
(140)

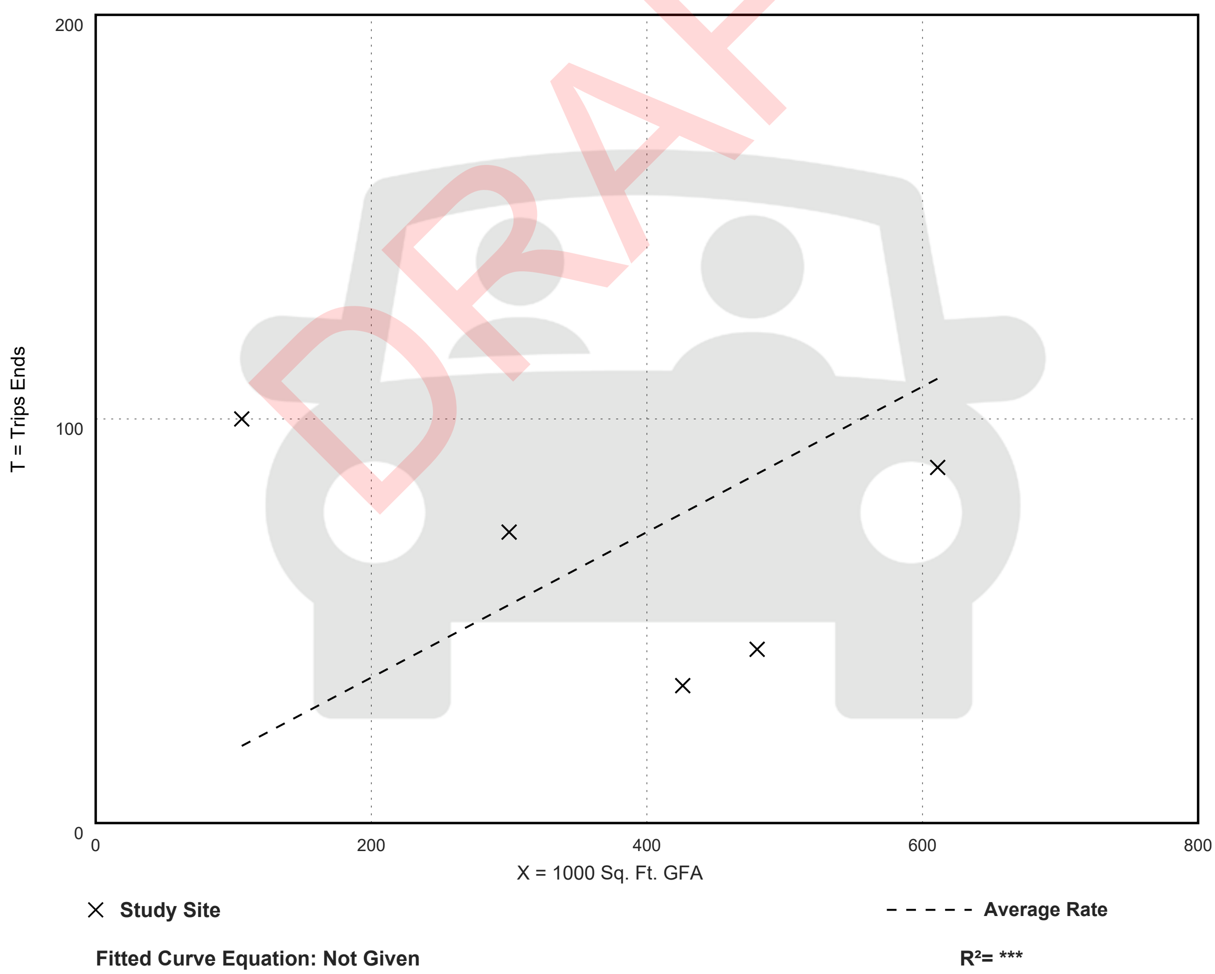
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 385
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.08 - 0.94	0.22

Data Plot and Equation



Manufacturing
(140)

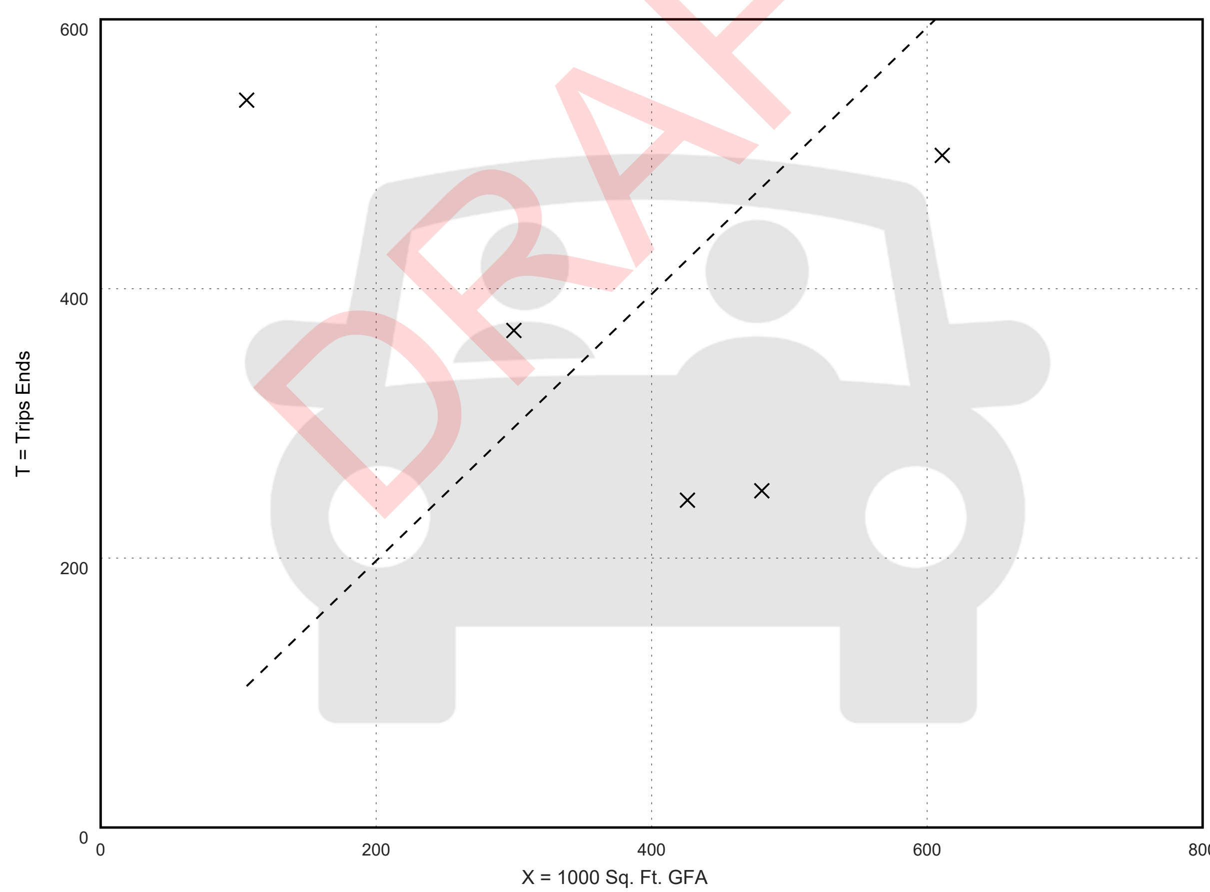
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 385
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.99	0.52 - 5.09	1.14

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Manufacturing
(140)

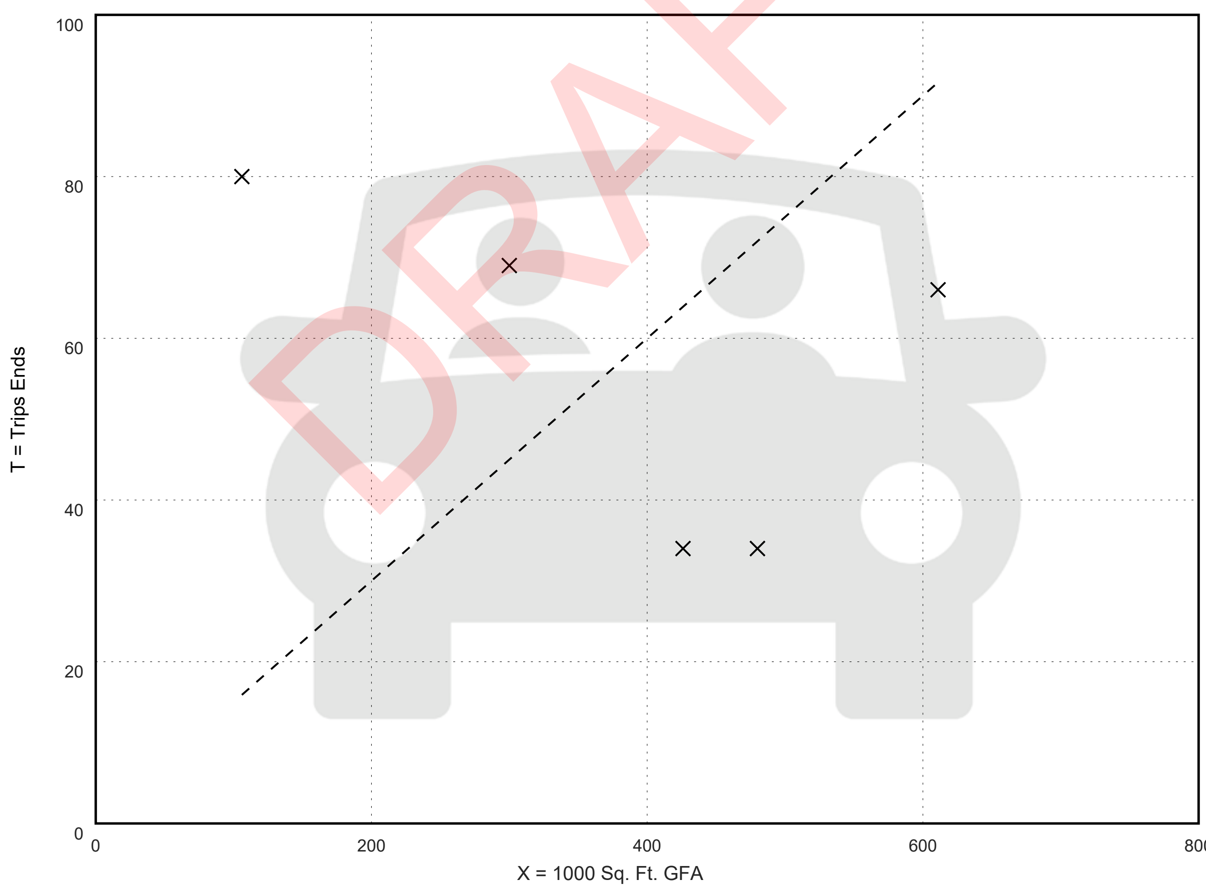
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 385
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.07 - 0.75	0.17

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Manufacturing
(140)

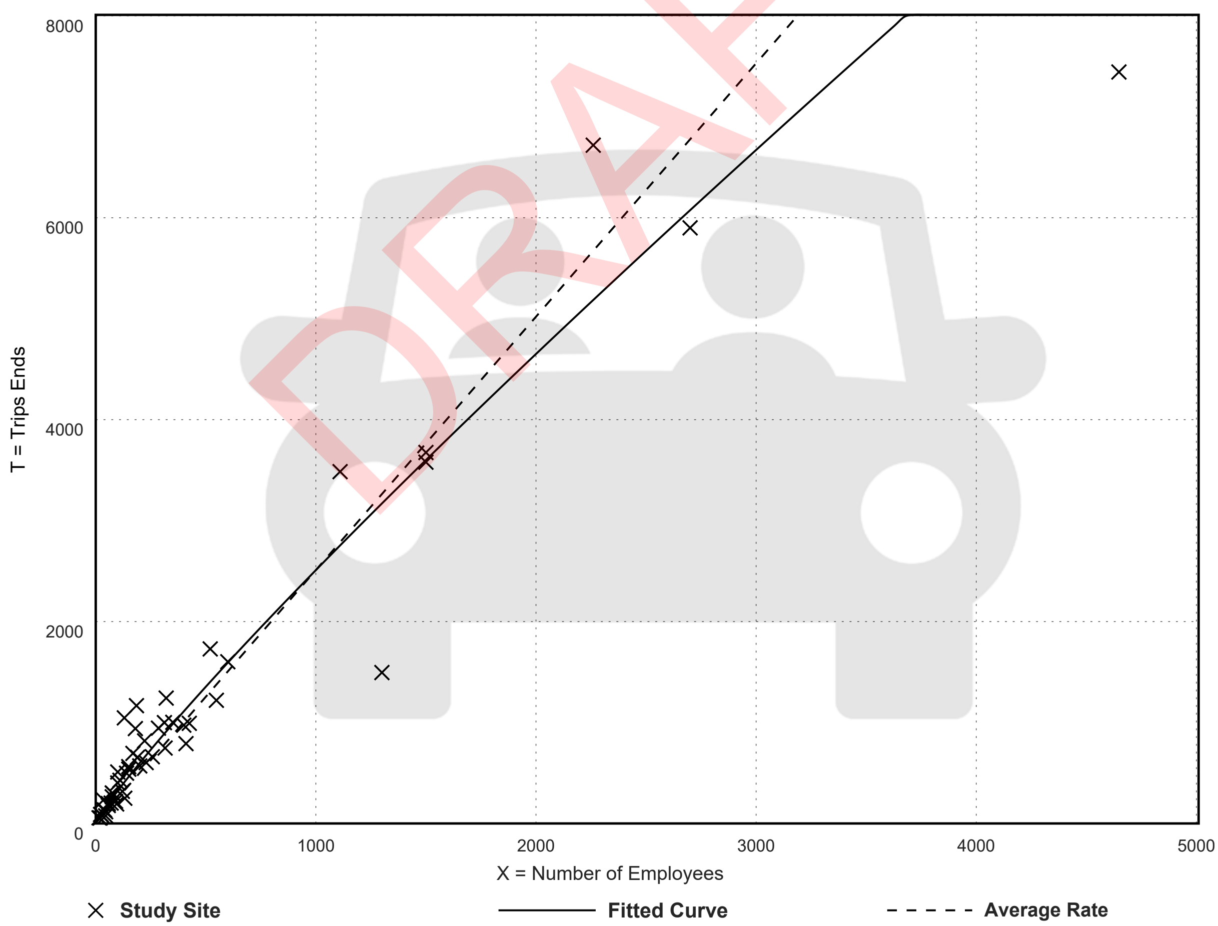
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 53
Avg. Num. of Employees: 437
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
2.51	1.15 - 8.05	0.96

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.89 Ln(X) + 1.68 **R^2= 0.93**

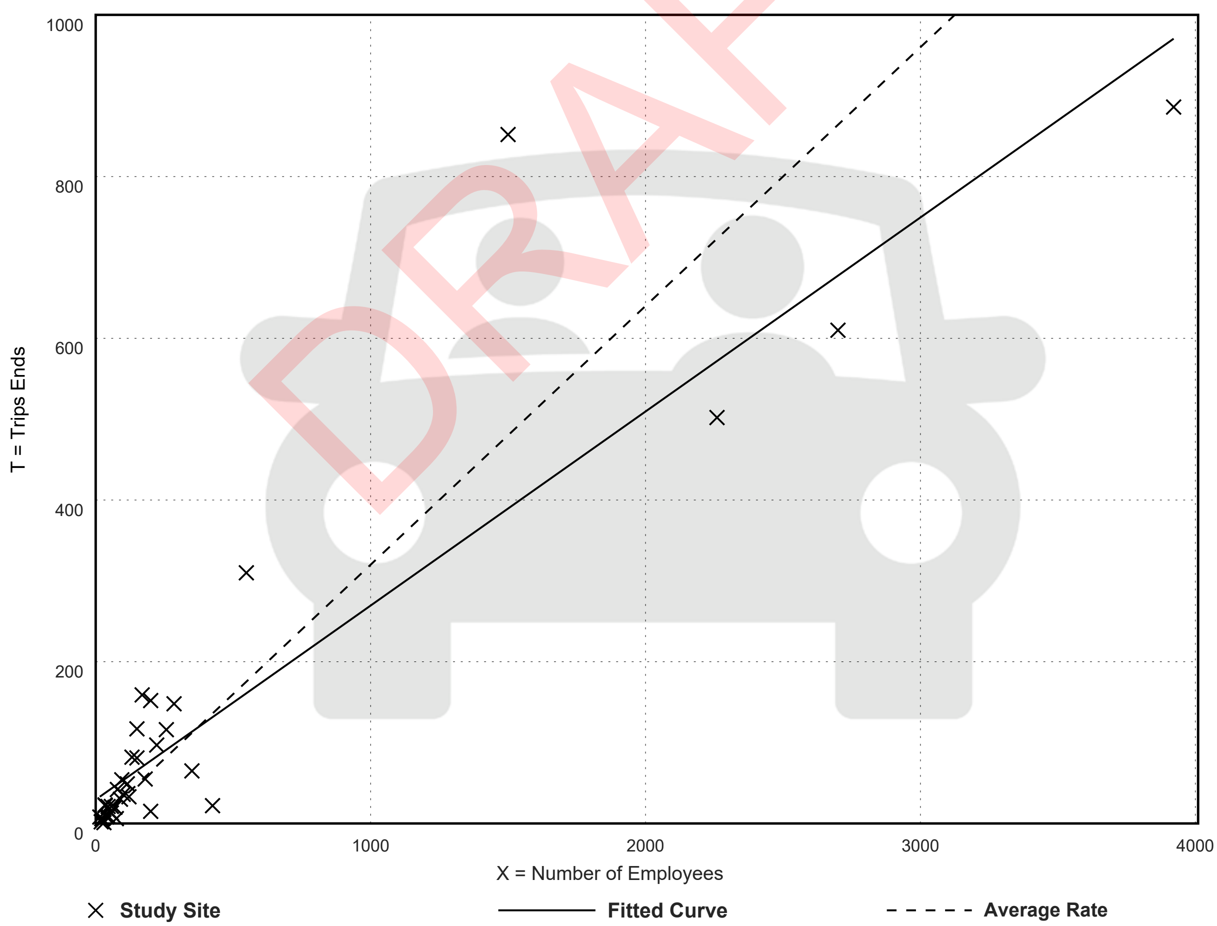
Manufacturing
(140)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. Num. of Employees: 400
Directional Distribution: 73% entering, 27% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.32	0.03 - 0.94	0.18

Data Plot and Equation



Fitted Curve Equation: $T = 0.24(X) + 29.47$ **$R^2 = 0.83$**

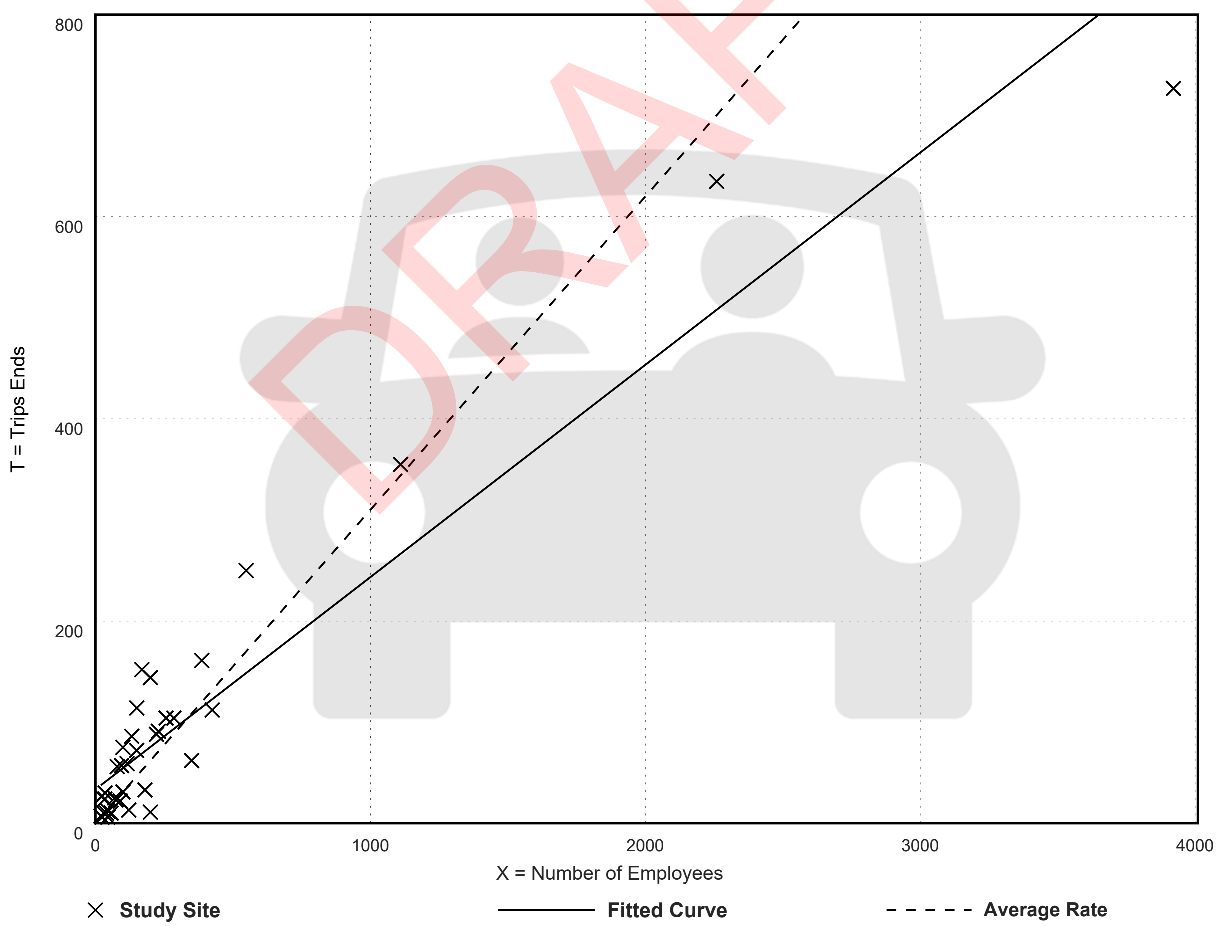
Manufacturing
(140)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. Num. of Employees: 334
Directional Distribution: 37% entering, 63% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.31	0.06 - 1.18	0.17

Data Plot and Equation



Fitted Curve Equation: $T = 0.21(X) + 33.45$ **$R^2 = 0.90$**

Manufacturing
(140)

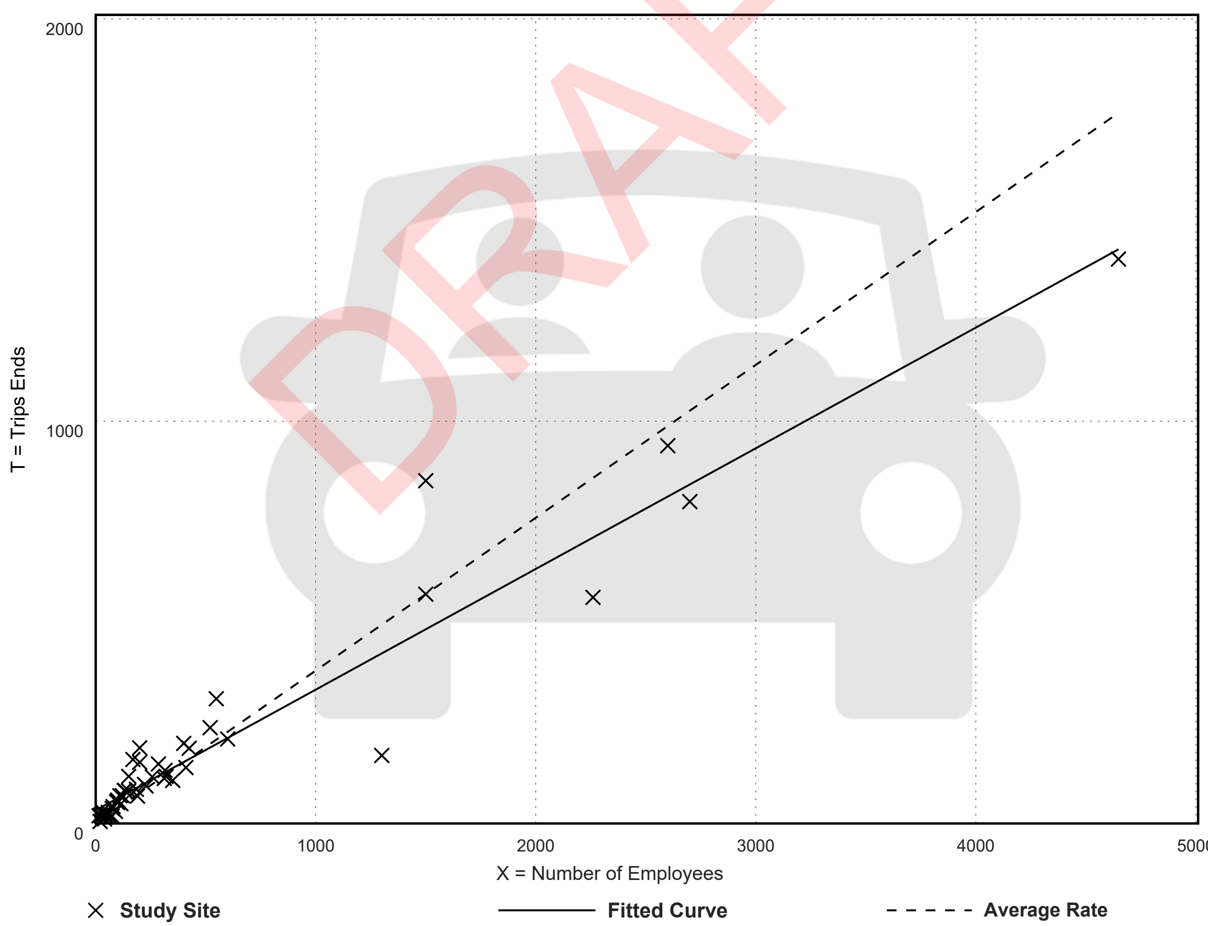
Vehicle Trip Ends vs: Employees
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 54
Avg. Num. of Employees: 459
Directional Distribution: 83% entering, 17% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.38	0.13 - 1.27	0.15

Data Plot and Equation



Fitted Curve Equation: T = 0.30(X) + 32.68 $R^2 = 0.92$

Manufacturing
(140)

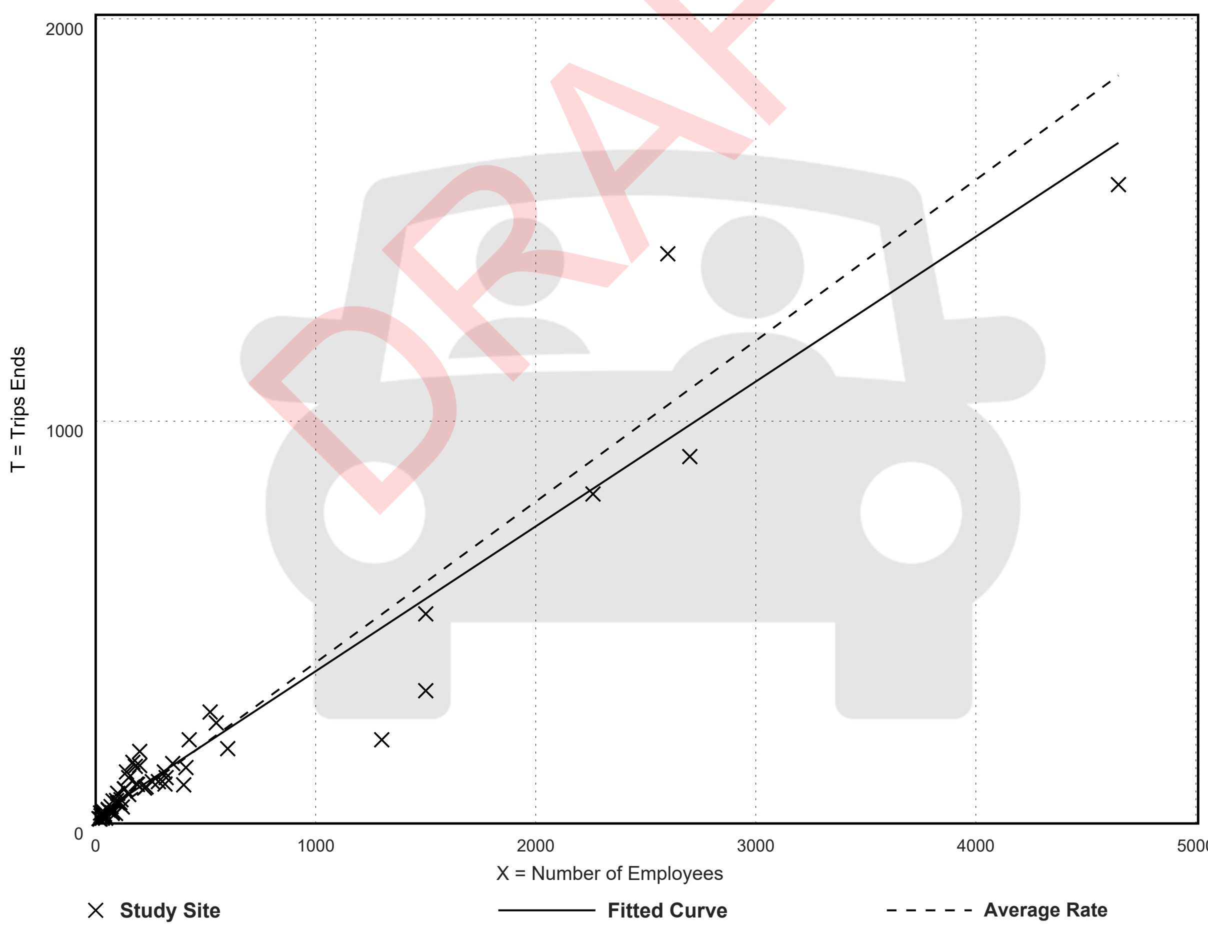
Vehicle Trip Ends vs: Employees
On a: Weekday, PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 55
Avg. Num. of Employees: 454
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.40	0.16 - 1.18	0.15

Data Plot and Equation



Fitted Curve Equation: $T = 0.36(X) + 18.55$

$R^2 = 0.92$

Manufacturing
(140)

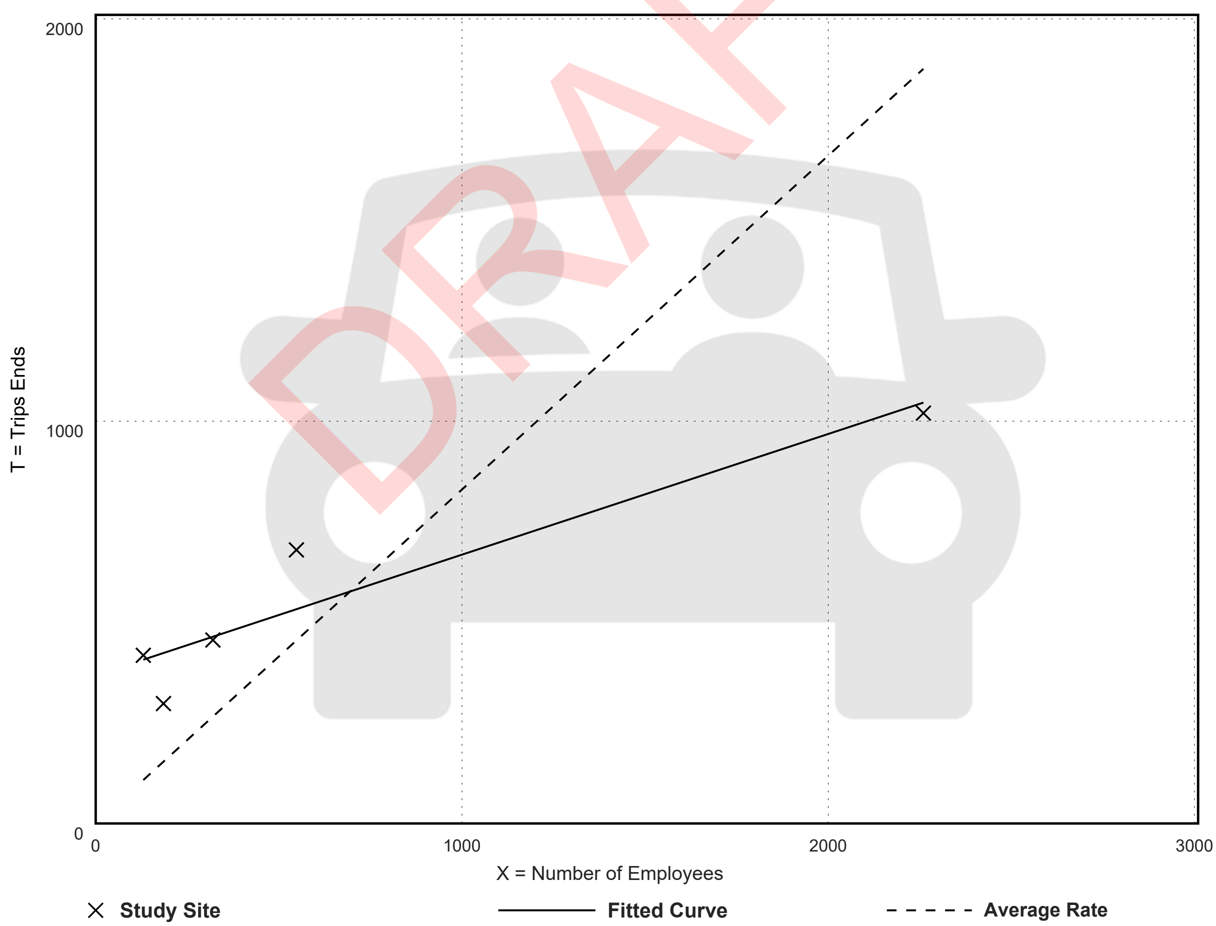
Vehicle Trip Ends vs: Employees
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 689
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.83	0.45 - 3.22	0.71

Data Plot and Equation



Fitted Curve Equation: T = 0.30(X) + 368.17 **R^2= 0.88**

Manufacturing
(140)

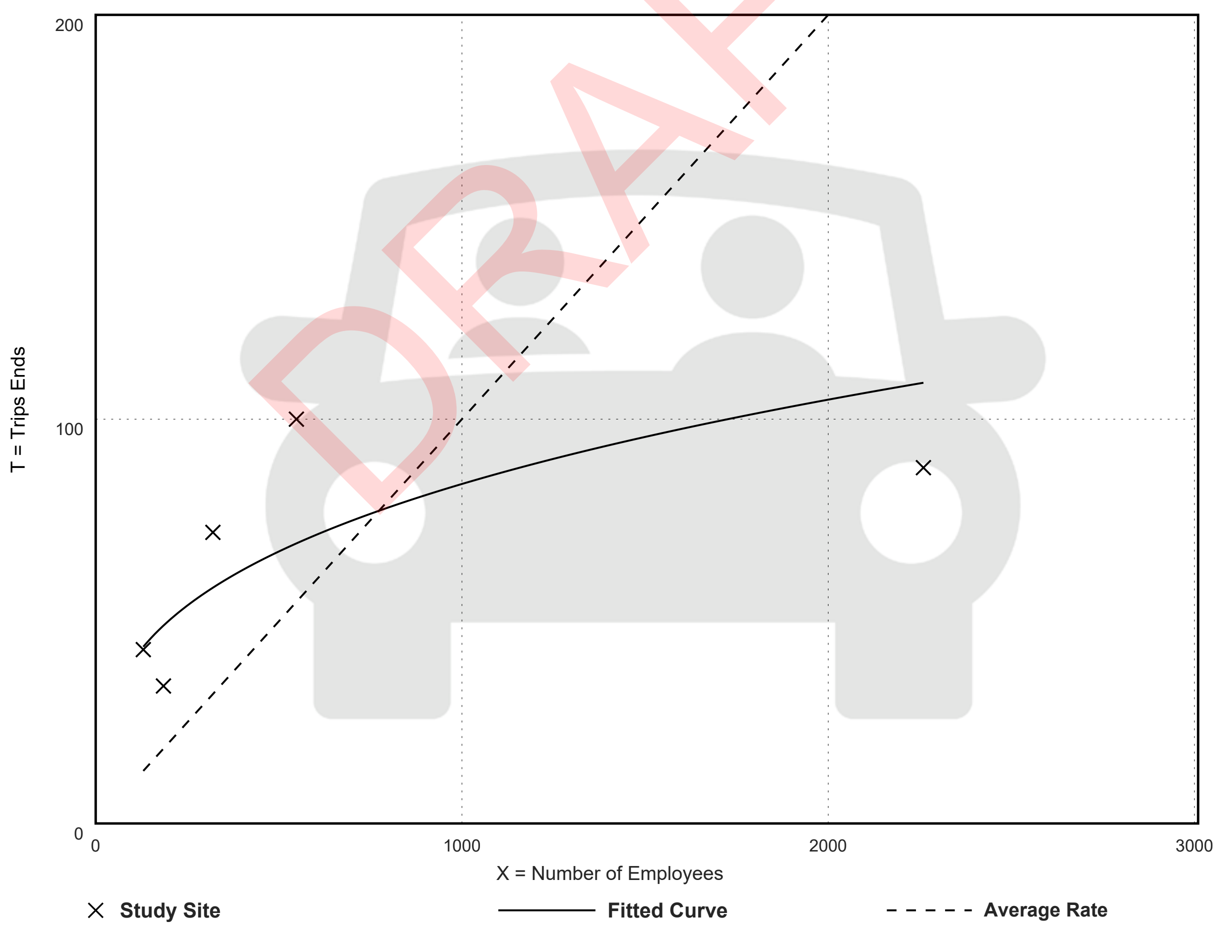
Vehicle Trip Ends vs: Employees
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 689
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.10	0.04 - 0.33	0.10

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.32 Ln(X) + 2.22

R^2= 0.59

Manufacturing
(140)

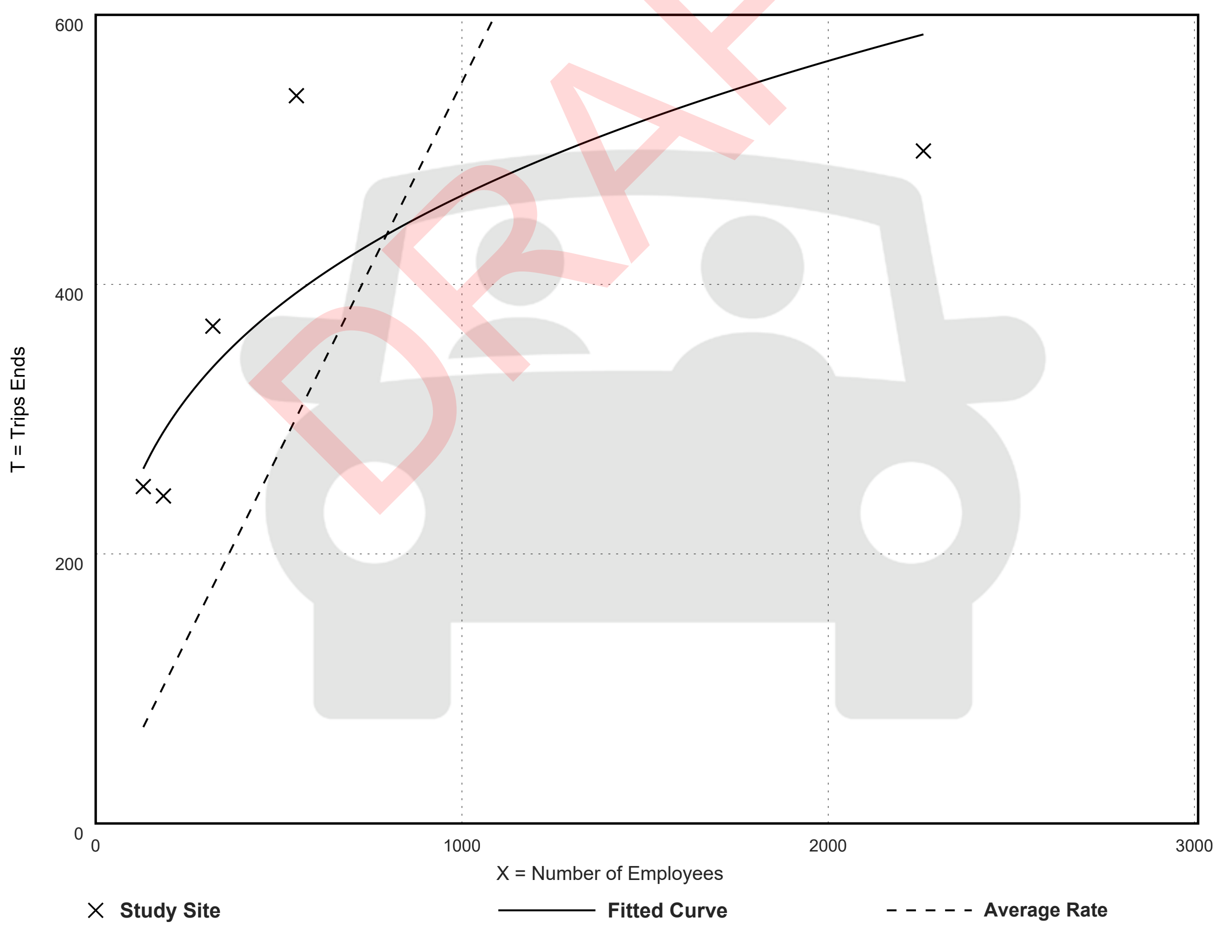
Vehicle Trip Ends vs: Employees
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 689
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.55	0.22 - 1.92	0.55

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.28 Ln(X) + 4.21

R^2= 0.70

Manufacturing
(140)

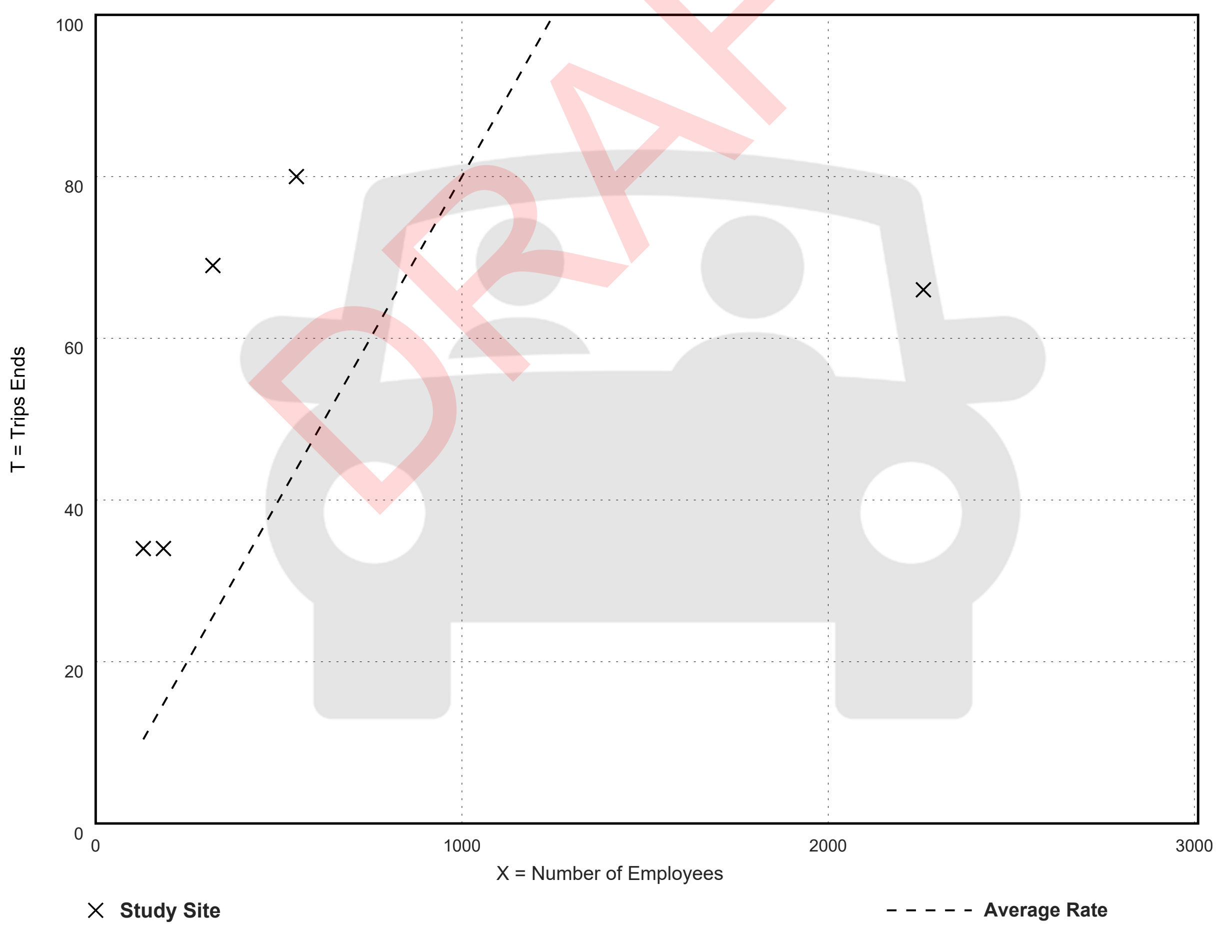
Vehicle Trip Ends vs: Employees
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Employees: 689
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.08	0.03 - 0.26	0.09

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= *

Manufacturing
(140)

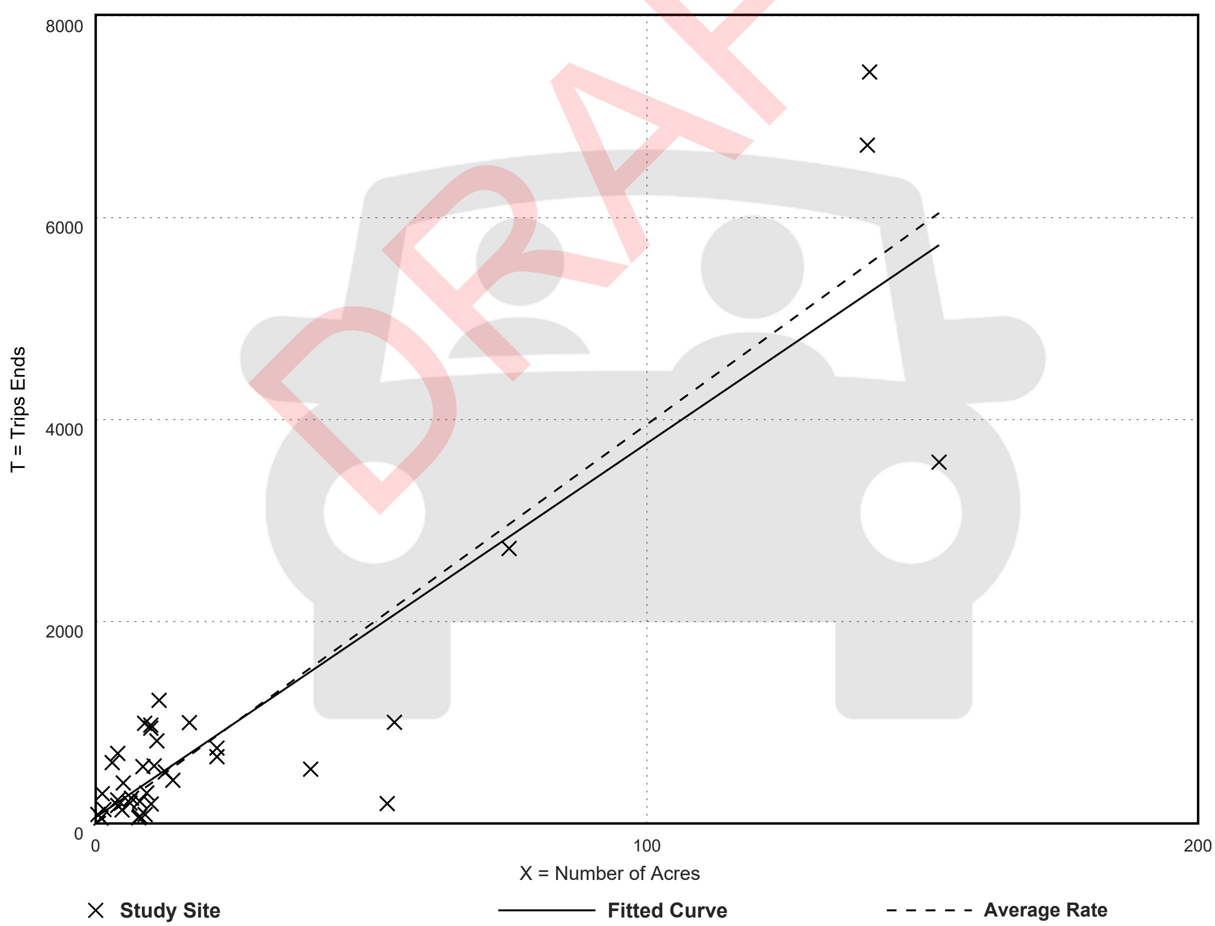
Vehicle Trip Ends vs: Acres
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. Num. of Acres: 24
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
39.53	3.72 - 245.83	27.04

Data Plot and Equation



Fitted Curve Equation: T = 37.05(X) + 60.72 **R^2= 0.80**

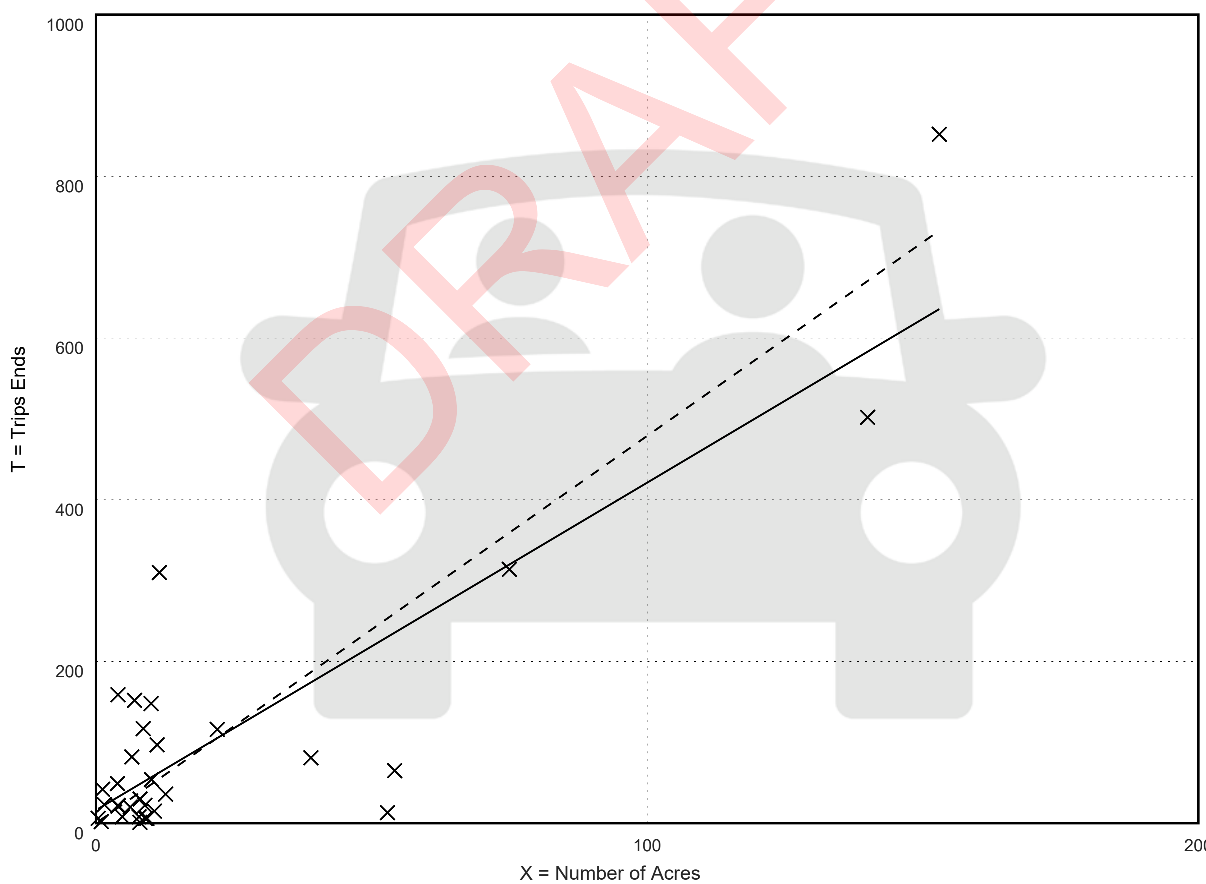
Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 32
Avg. Num. of Acres: 22
Directional Distribution: 86% entering, 14% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
4.79	0.13 - 39.75	5.36

Data Plot and Equation



Study Site — **Fitted Curve** — **Average Rate**

Fitted Curve Equation: T = 4.05(X) + 16.16 **R^2= 0.73**

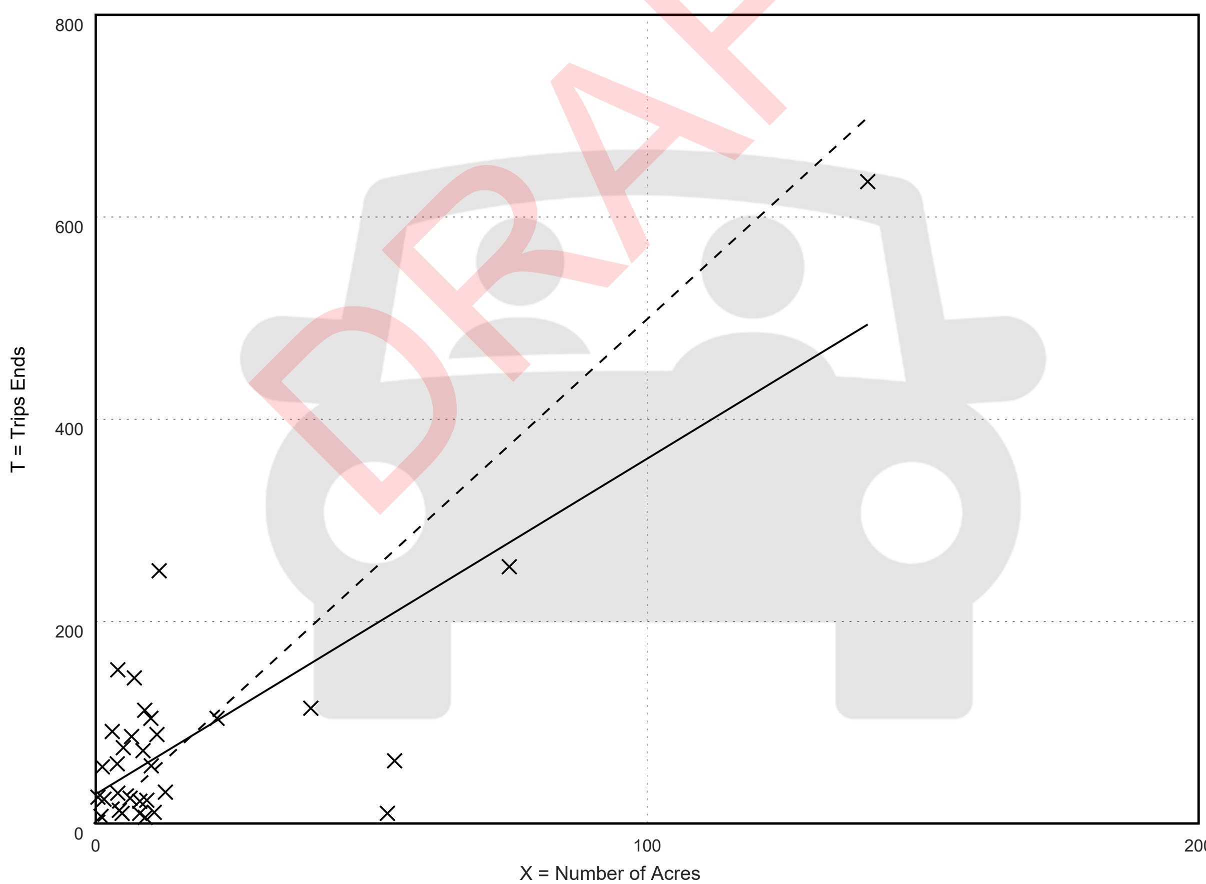
Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 32
Avg. Num. of Acres: 17
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
4.99	0.19 - 65.00	6.17

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: T = 3.32(X) + 28.91 **R^2= 0.63**

Manufacturing
(140)

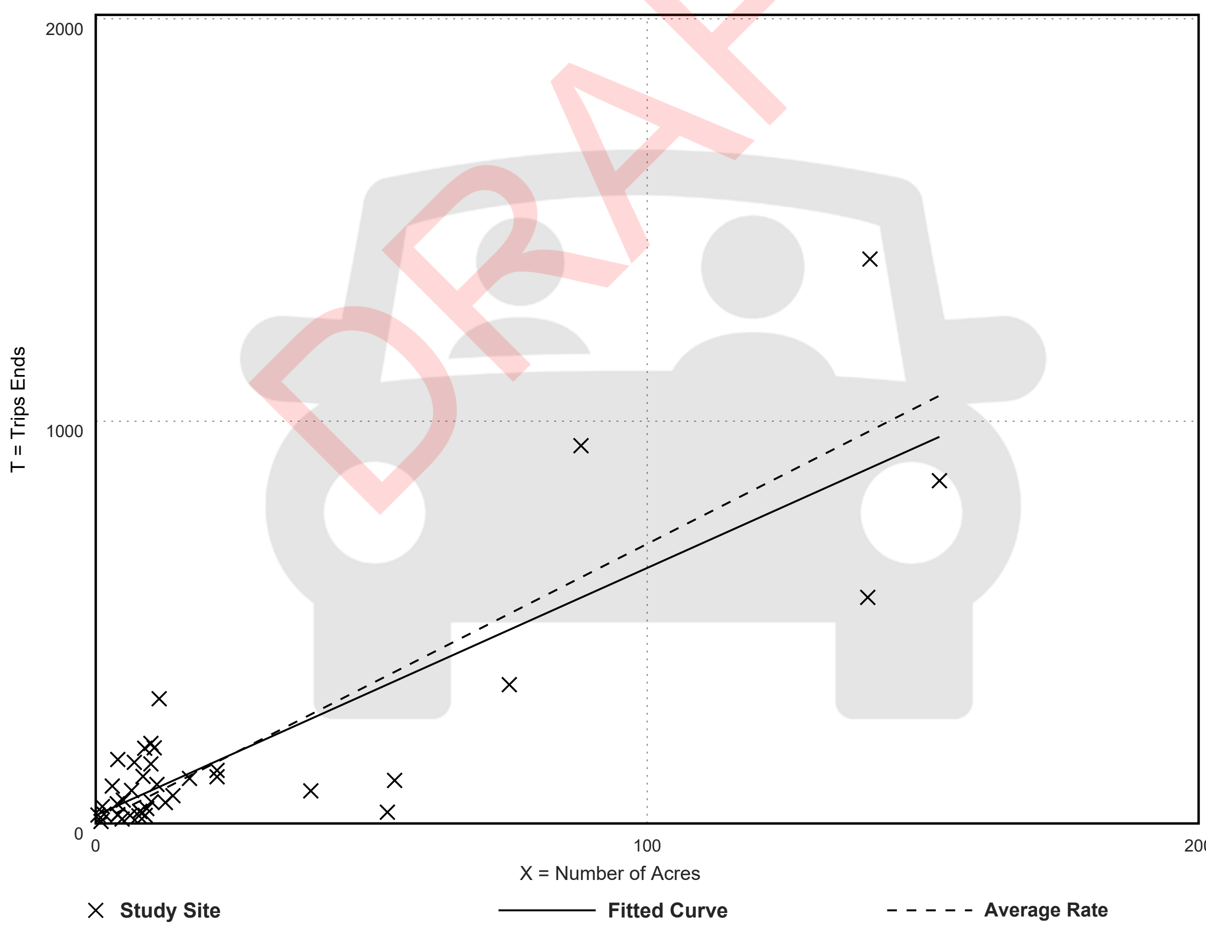
Vehicle Trip Ends vs: **Acres**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 40
Avg. Num. of Acres: 25
Directional Distribution: 75% entering, 25% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
6.95	0.53 - 52.50	5.55

Data Plot and Equation



Fitted Curve Equation: $T = 6.15(X) + 20.14$

$R^2 = 0.73$

Manufacturing
(140)

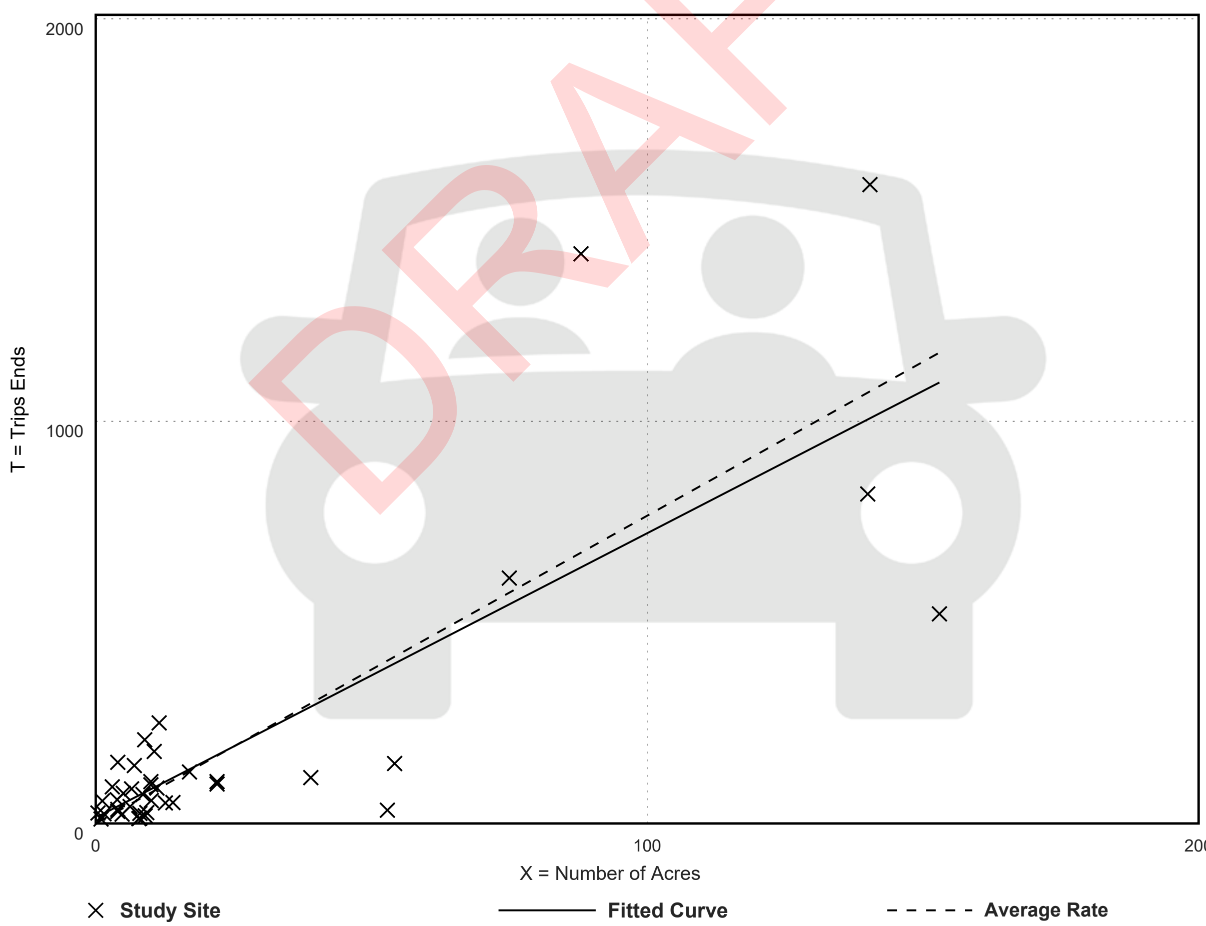
Vehicle Trip Ends vs: Acres
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. Num. of Acres: 25
Directional Distribution: 44% entering, 56% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
7.65	0.62 - 65.00	5.90

Data Plot and Equation



Fitted Curve Equation: T = 7.07(X) + 14.47   **R^2= 0.65**

Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Saturday

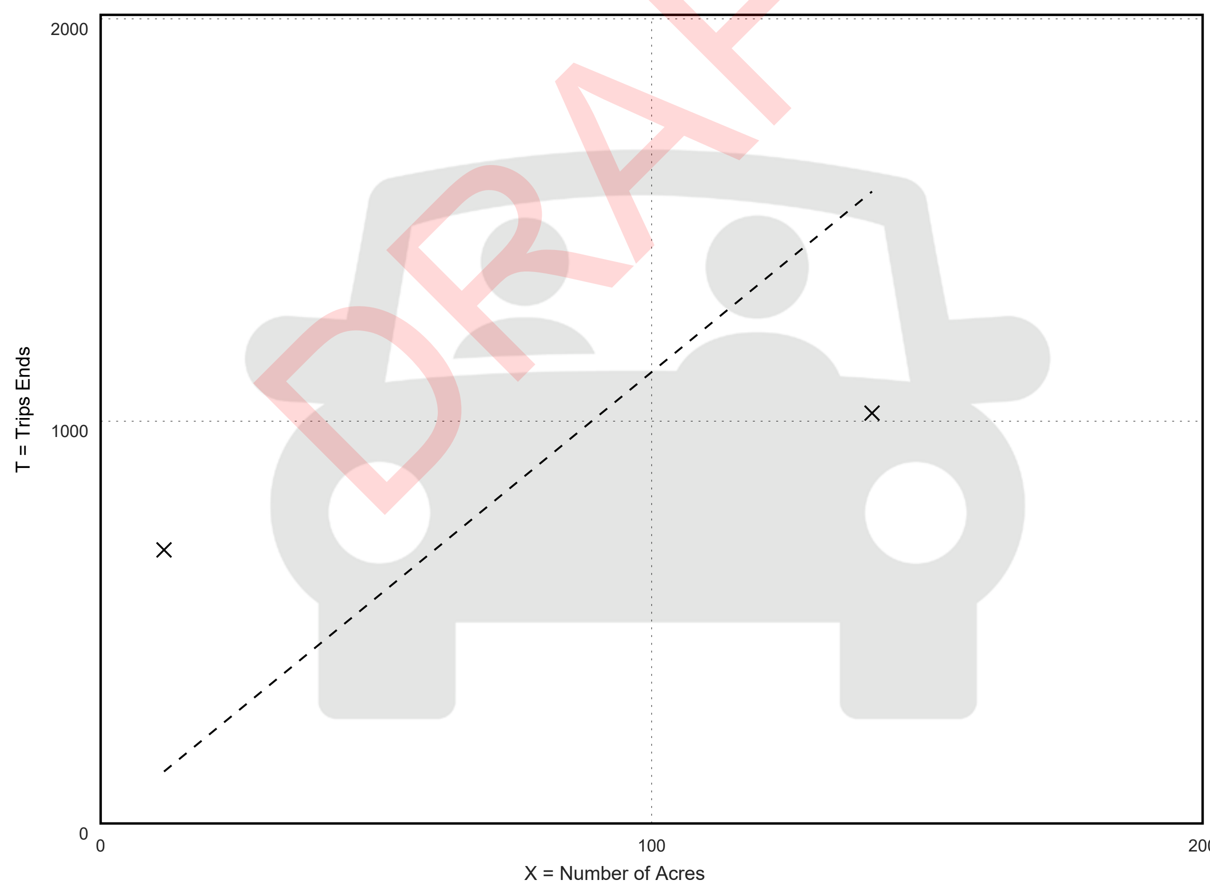
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Acres: 76
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
11.22	7.29 - 59.13	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Saturday, Peak Hour of Generator

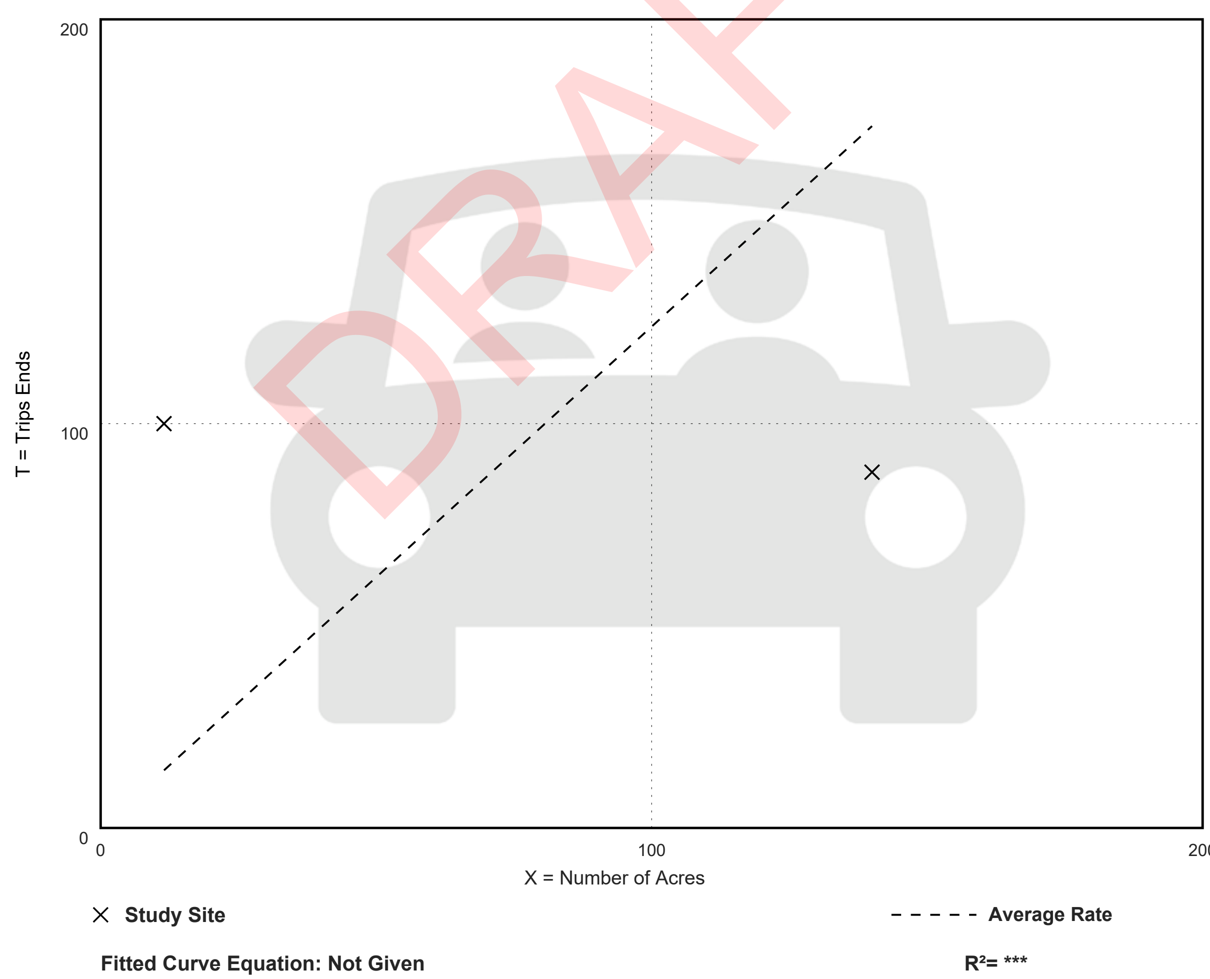
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Acres: 76
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
1.24	0.63 - 8.70	***

Data Plot and Equation

Caution – Small Sample Size



Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Sunday

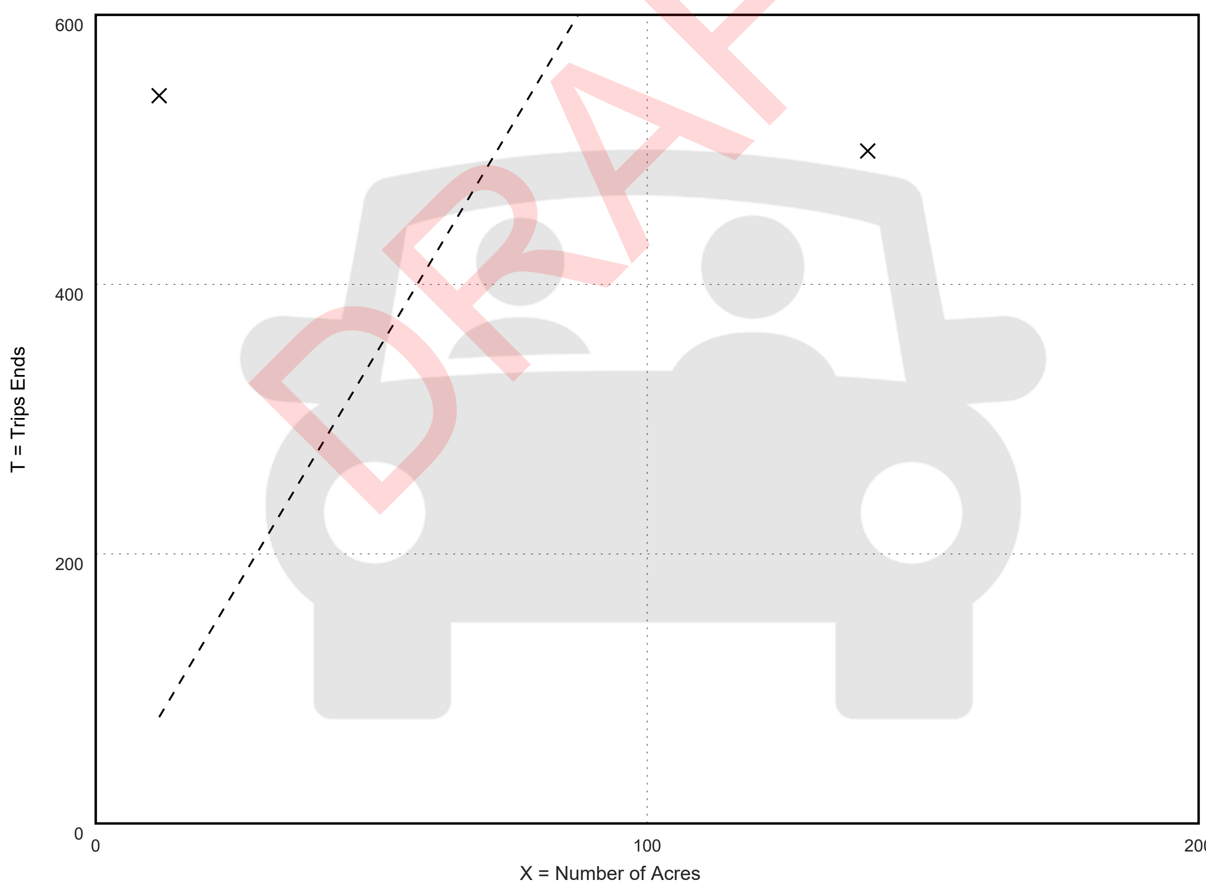
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Acres: 76
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
6.86	3.56 - 46.96	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= ***

Manufacturing
(140)

Vehicle Trip Ends vs: Acres
On a: Sunday, Peak Hour of Generator

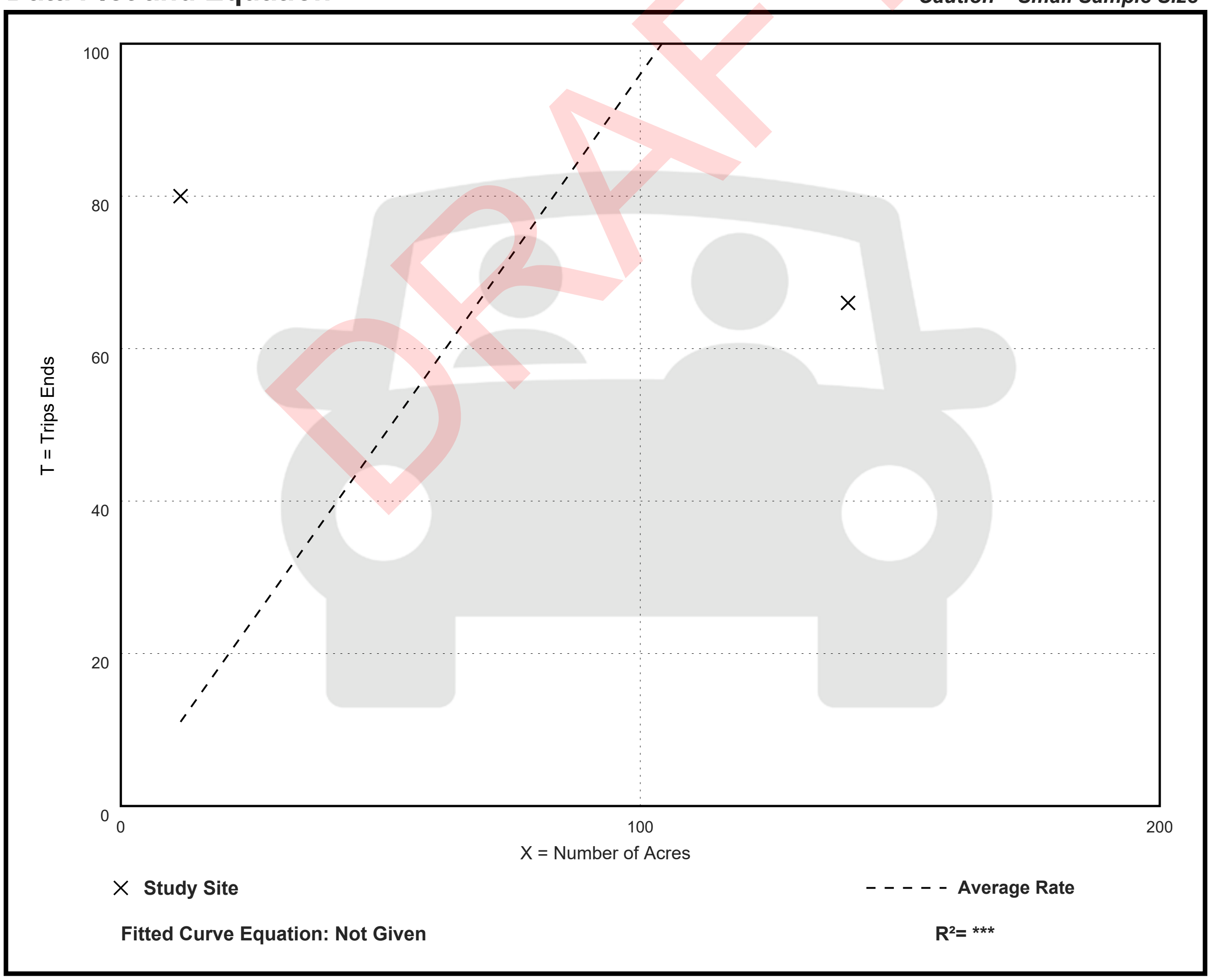
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Acres: 76
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.96	0.47 - 6.96	***

Data Plot and Equation

Caution – Small Sample Size



Manufacturing
(140)

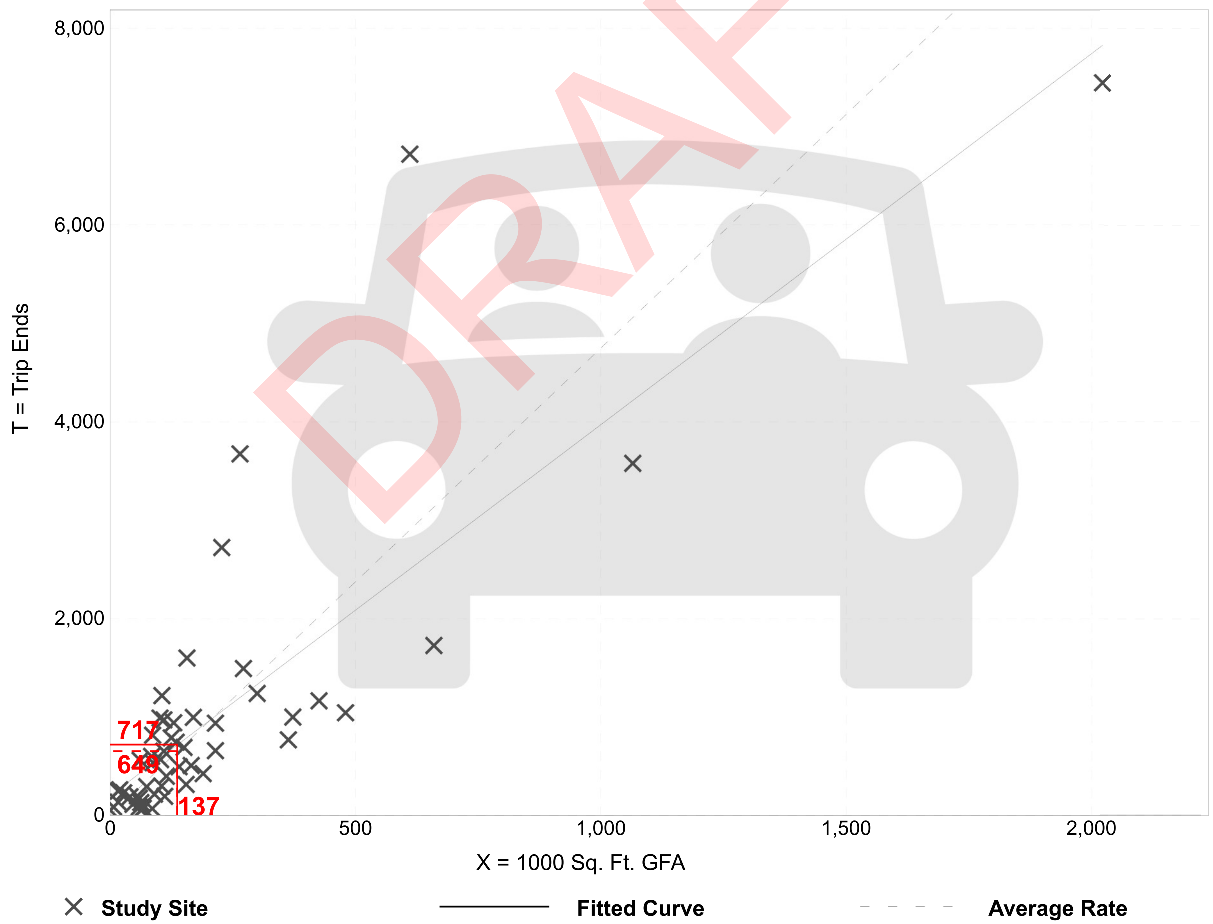
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 53
Avg. 1000 Sq. Ft. GFA: 208
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.75	0.83 - 49.50	3.20

Data Plot and Equation



Fitted Curve Equation: $T = 3.77(X) + 201.98$ **$R^2= 0.68$**

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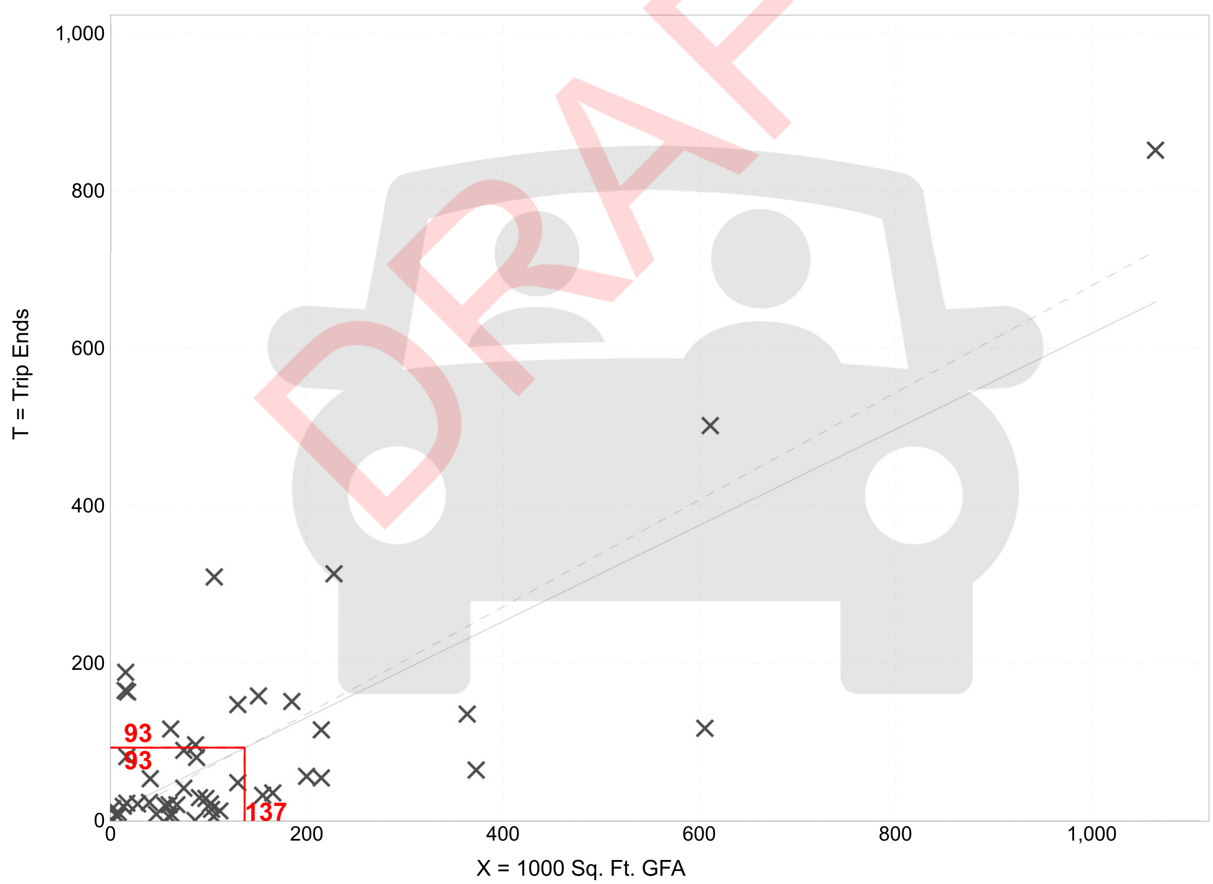
Manufacturing
(140)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	48
Avg. 1000 Sq. Ft. GFA:	138
Directional Distribution:	76% entering, 24% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.68	0.01 - 11.93	1.03

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: T = 0.61(X) + 9.54 **R^2= 0.62**

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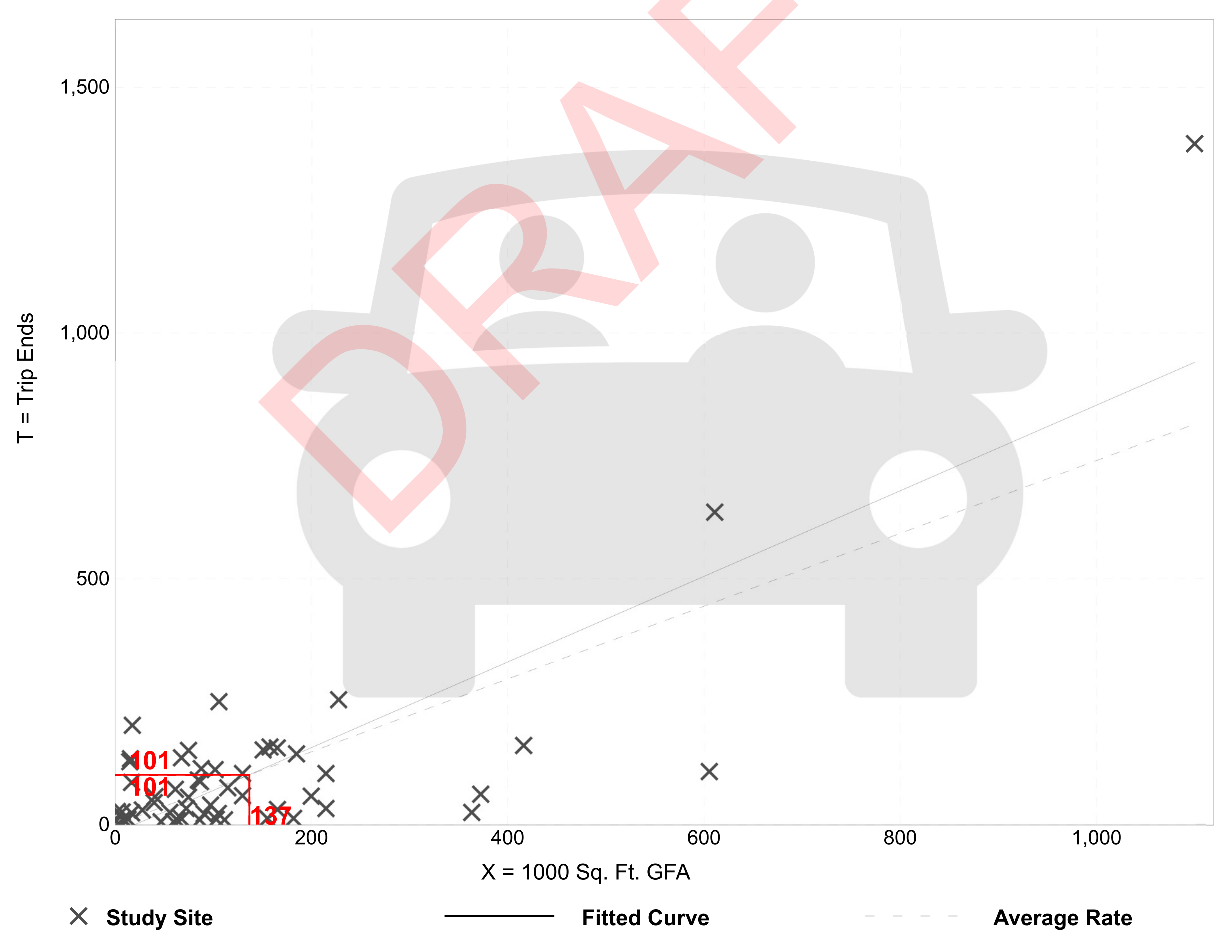
Manufacturing
(140)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	55
Avg. 1000 Sq. Ft. GFA:	142
Directional Distribution:	31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.07 - 11.37	0.93

Data Plot and Equation



Fitted Curve Equation: $T = 0.87(X) - 17.50$ **R^2= 0.64**

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Manufacturing
(140)

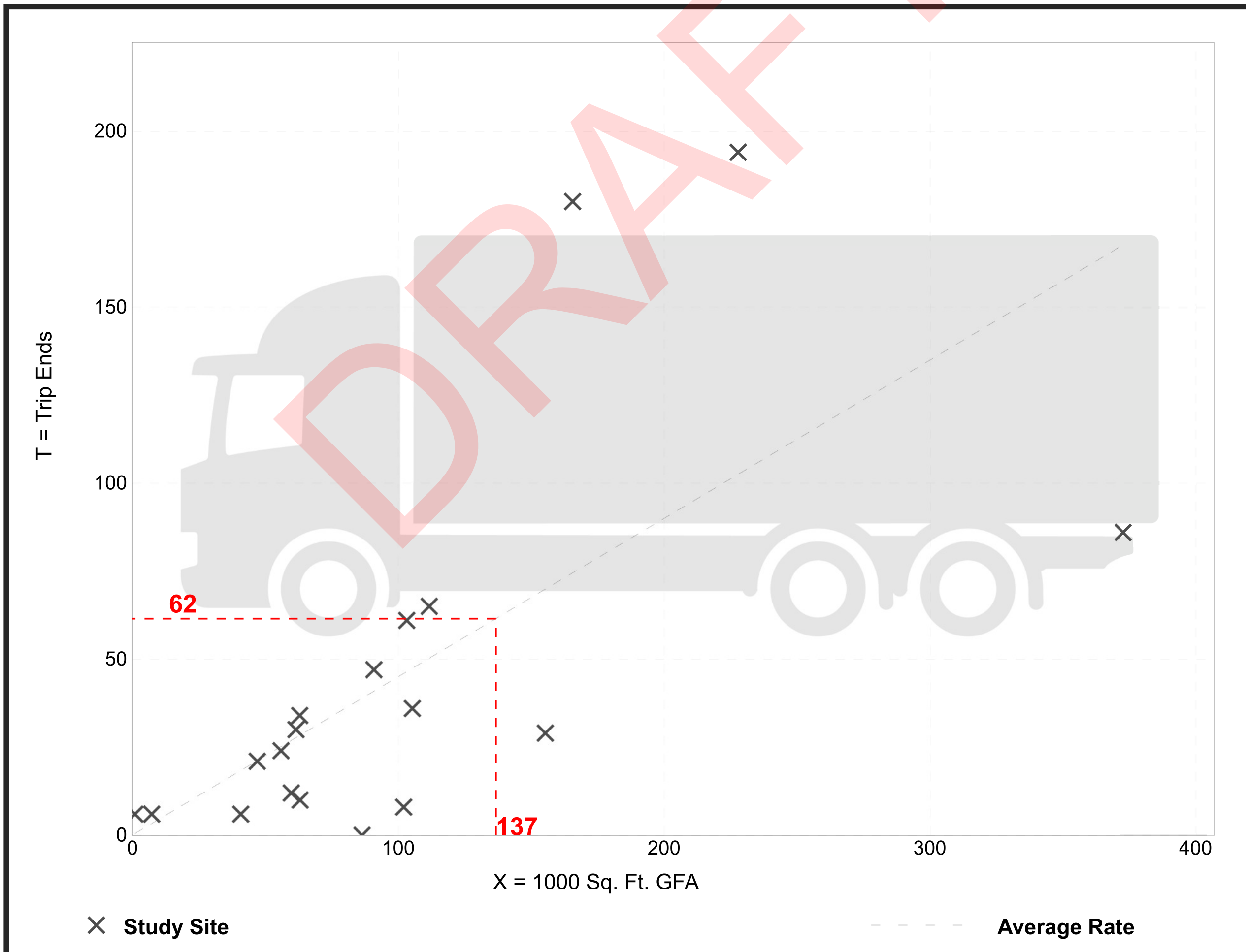
Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 19
Avg. 1000 Sq. Ft. GFA: 101
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.45	0.00 - 5.50	0.34

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

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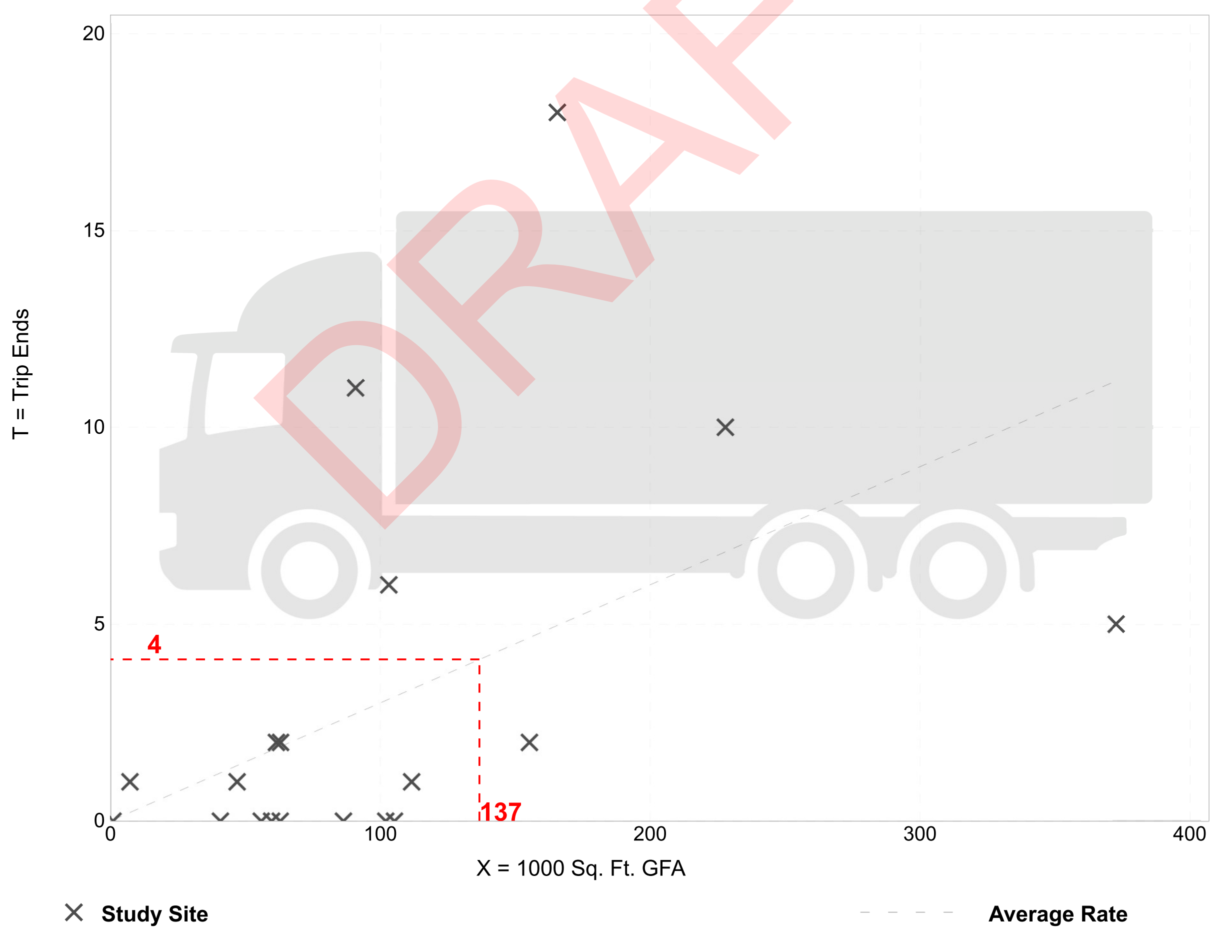
Manufacturing
(140)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	19
Avg. 1000 Sq. Ft. GFA:	101
Directional Distribution:	56% entering, 44% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.14	0.04

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

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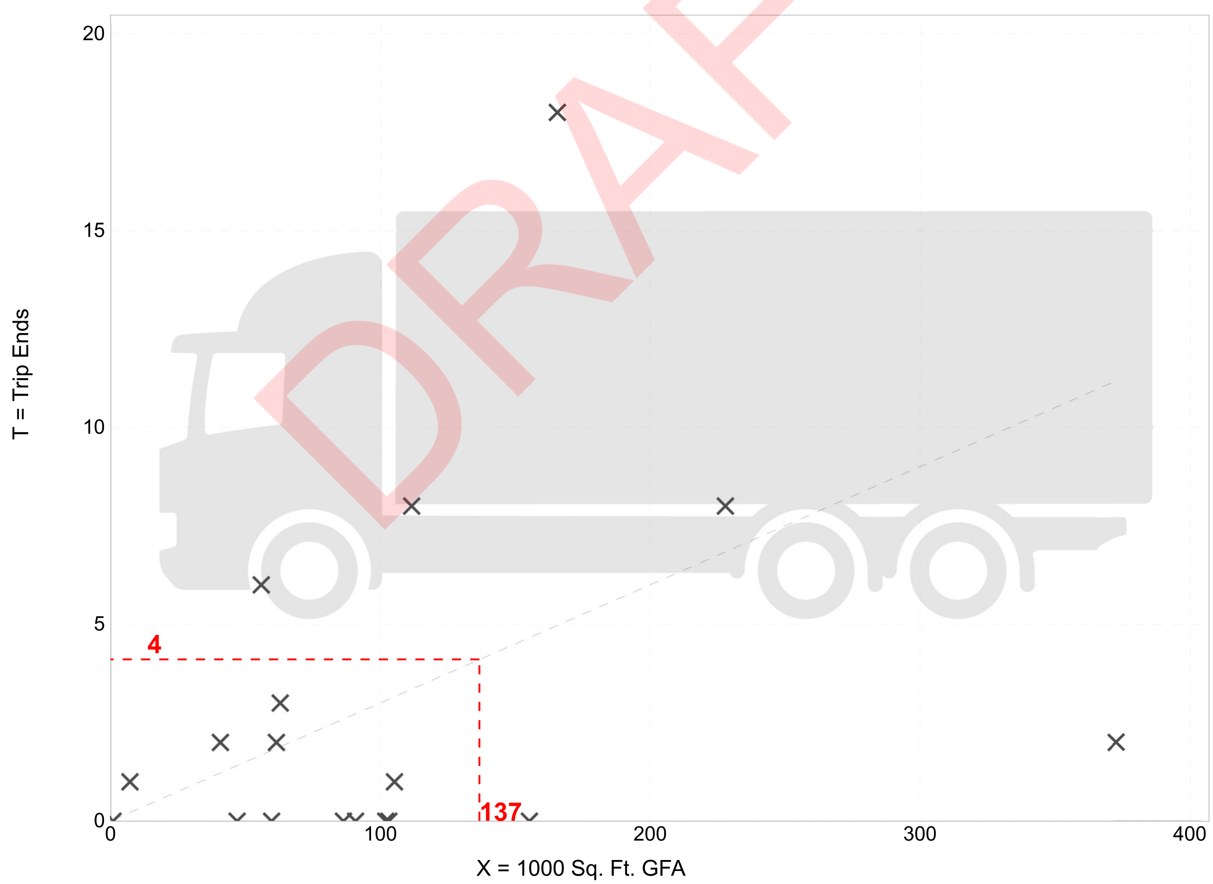
Manufacturing
(140)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	18
Avg. 1000 Sq. Ft. GFA:	103
Directional Distribution:	41% entering, 59% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.14	0.04

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

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Land Use: 150
Warehousing

Description

A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas. High-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas.

Source Numbers

184, 331, 406, 411, 443, 579, 583, 596, 598, 611, 619, 642, 752, 869, 875, 876, 914, 940, 1050

Warehousing
(150)

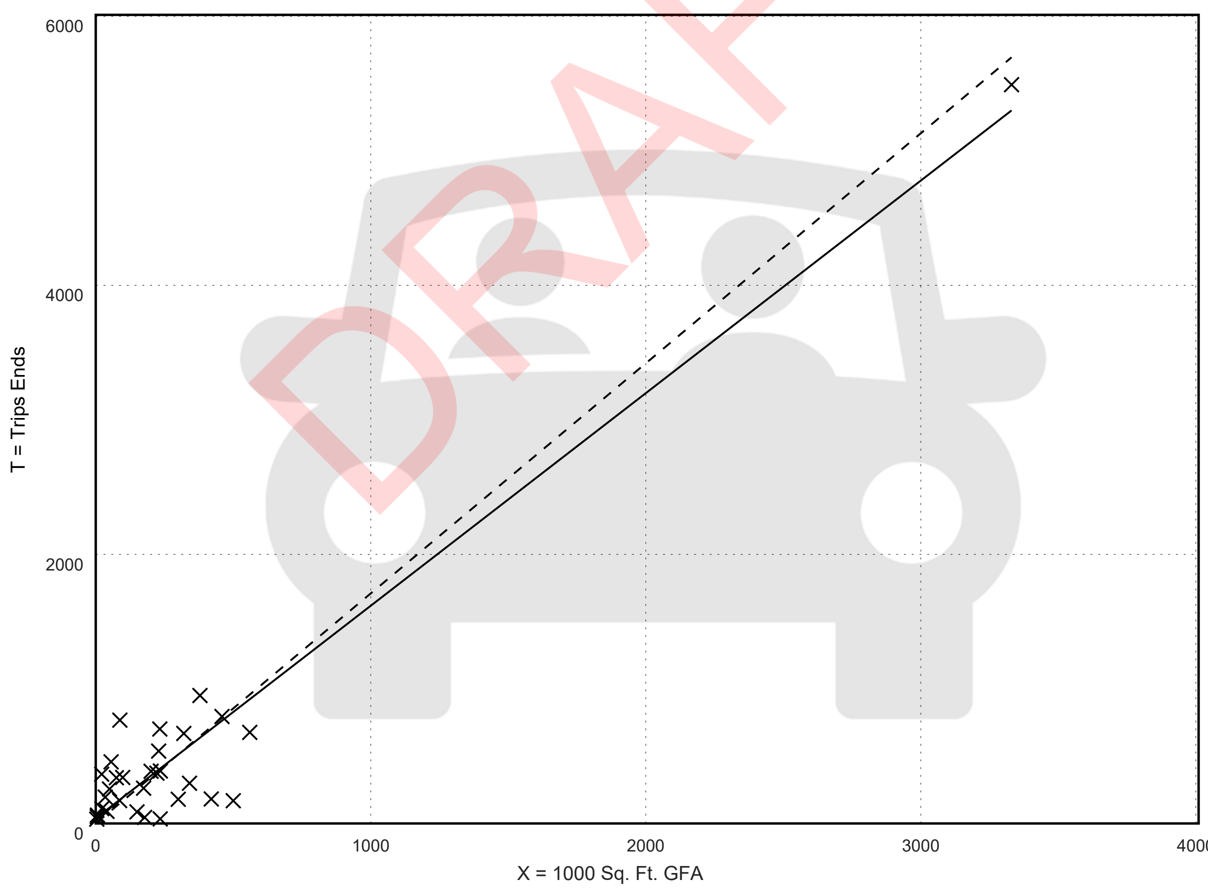
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 292
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: $T = 1.58(X) + 38.29$ **$R^2 = 0.92$**

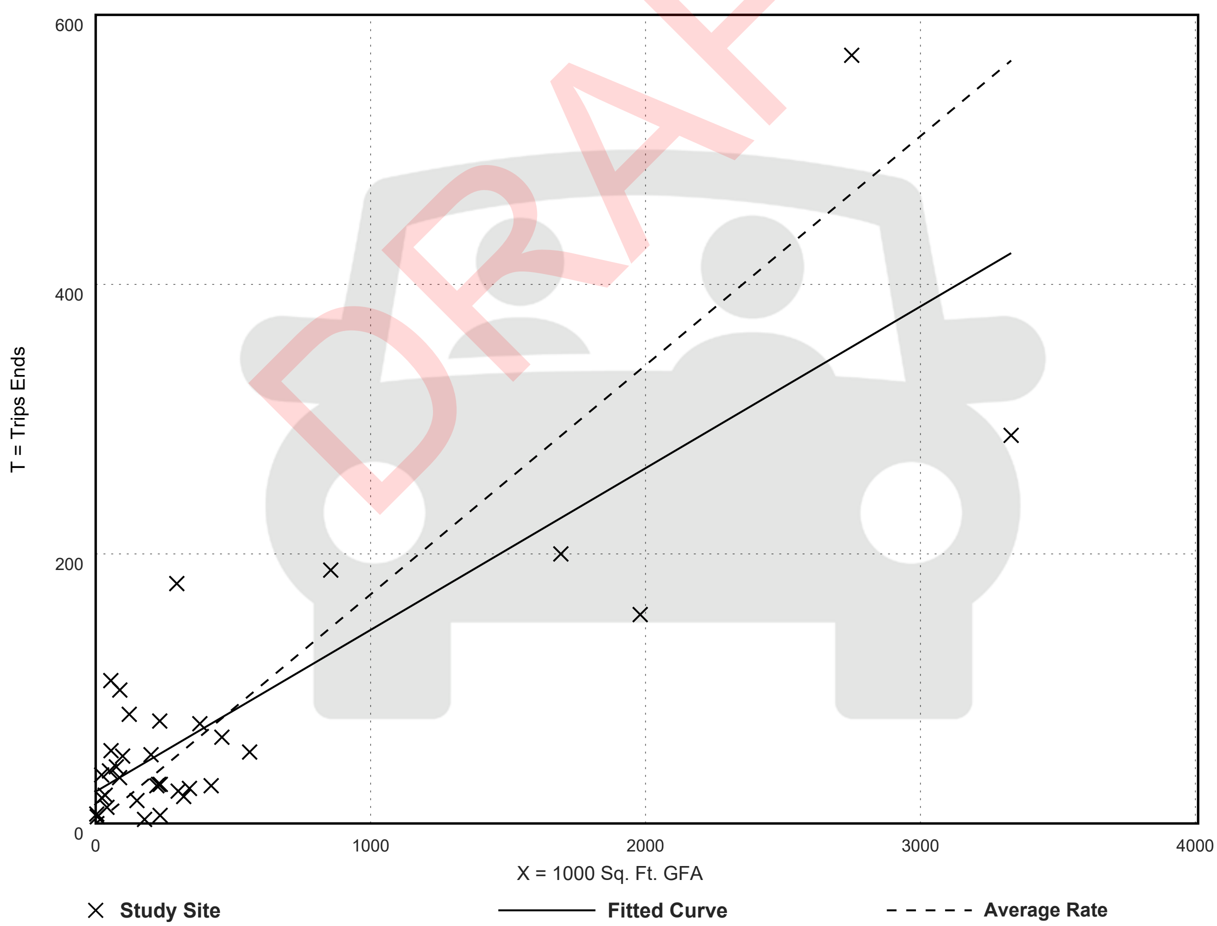
Warehousing
(150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 36
Avg. 1000 Sq. Ft. GFA: 448
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



Fitted Curve Equation: T = 0.12(X) + 23.62 **R^2= 0.69**

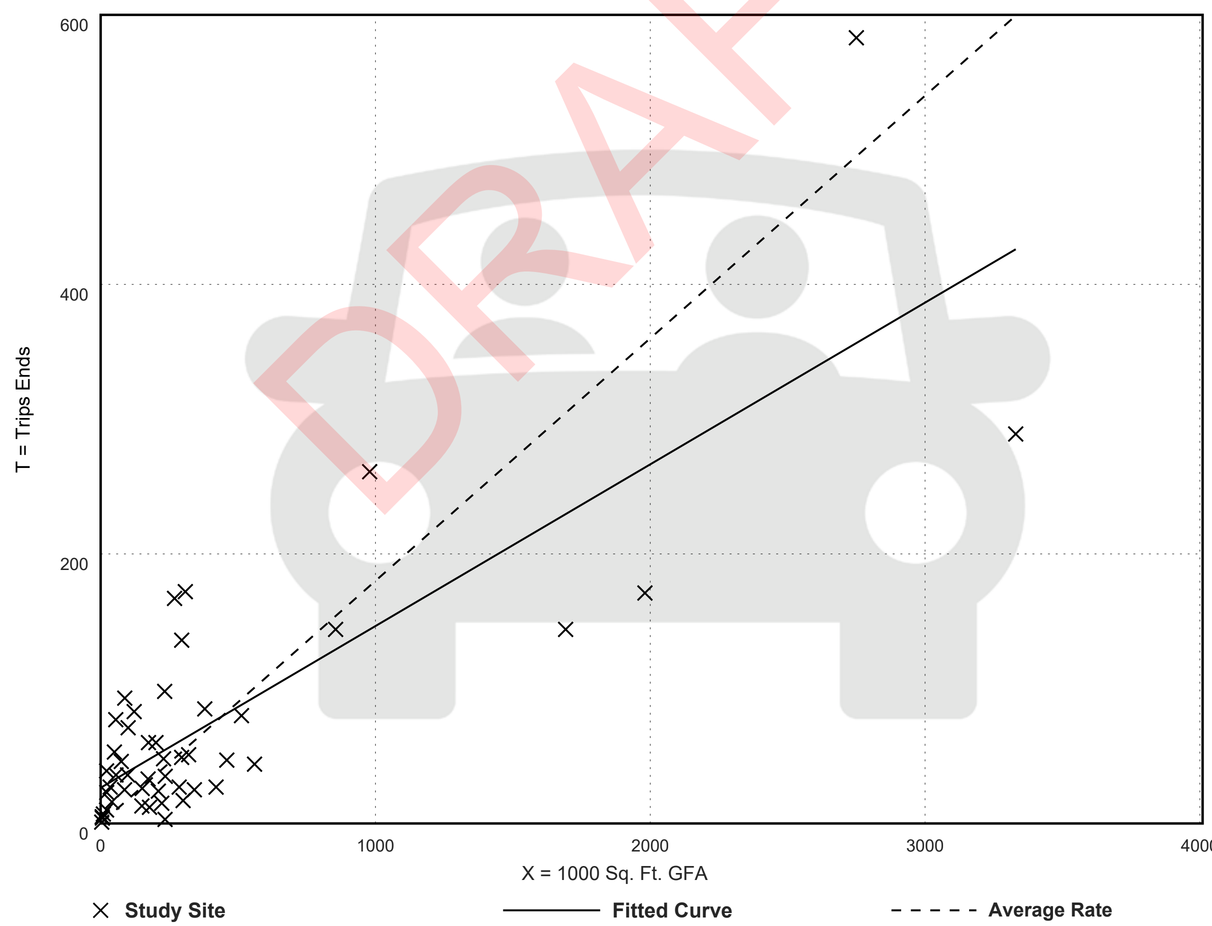
Warehousing
(150)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	49
Avg. 1000 Sq. Ft. GFA:	400
Directional Distribution:	28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



Fitted Curve Equation: T = 0.12(X) + 26.48 **R^2= 0.65**

Warehousing
(150)

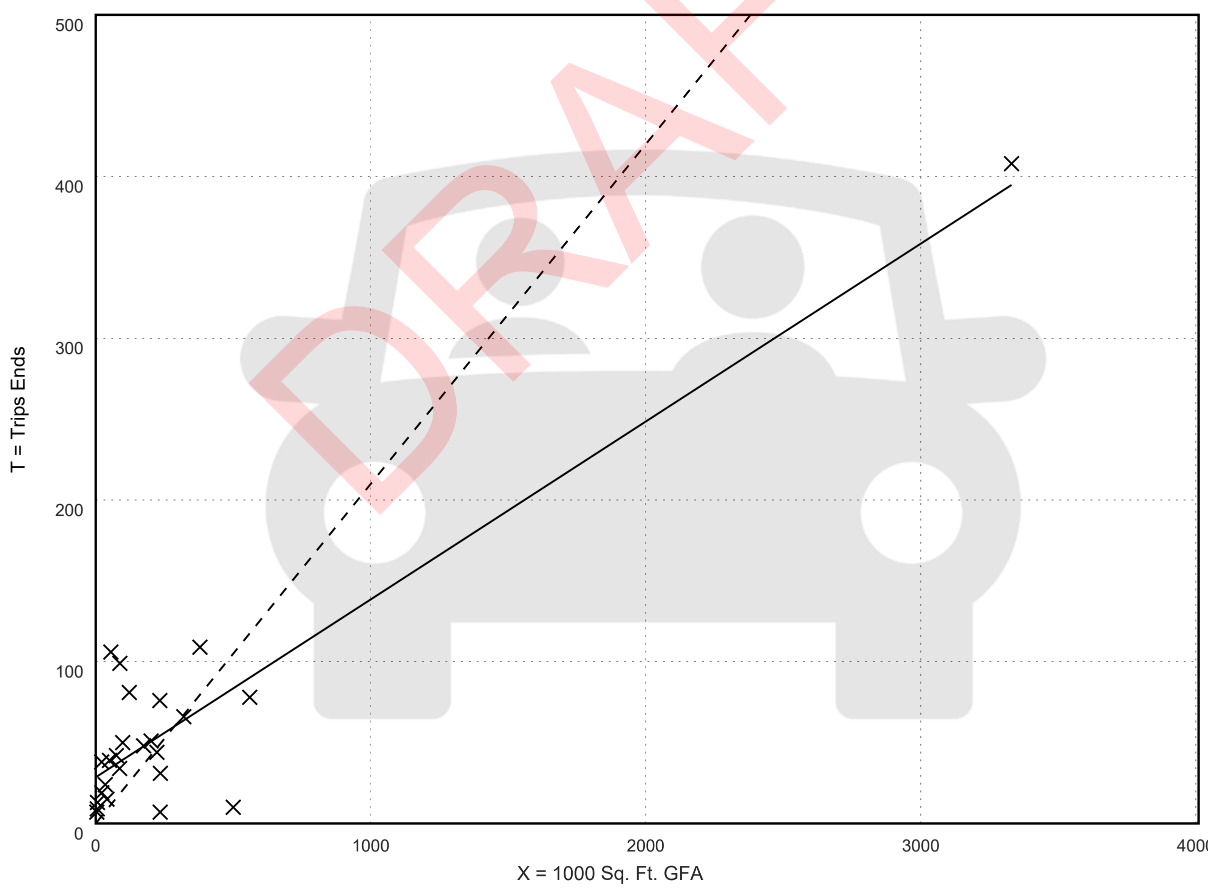
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 25
Avg. 1000 Sq. Ft. GFA: 284
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.21	0.02 - 2.08	0.26

Data Plot and Equation



× **Study Site** — **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: $T = 0.11(X) + 28.55$ **$R^2 = 0.85$**

Warehousing
(150)

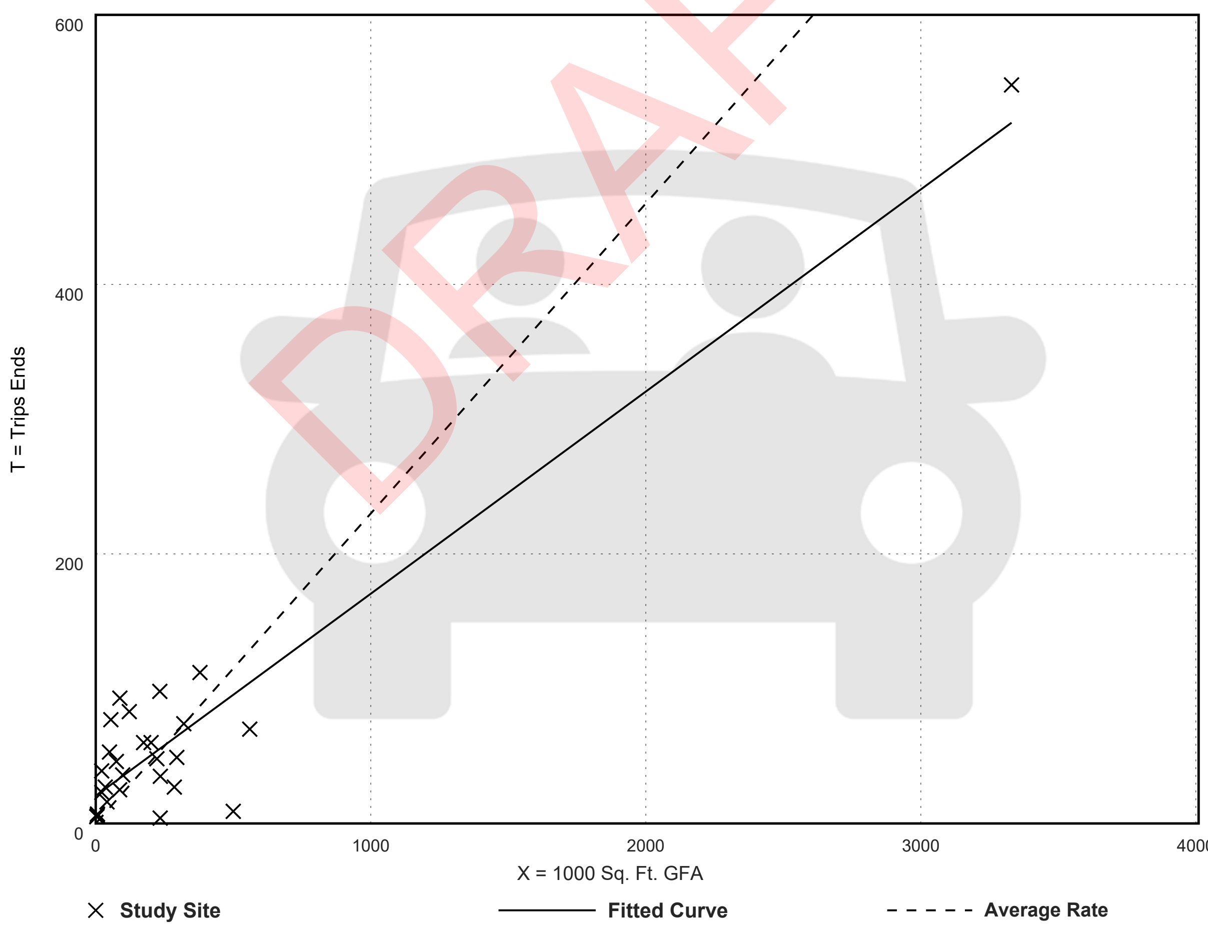
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 284
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.23	0.02 - 1.80	0.23

Data Plot and Equation



Fitted Curve Equation: T = 0.15(X) + 20.47 **R^2= 0.90**

Warehousing
(150)

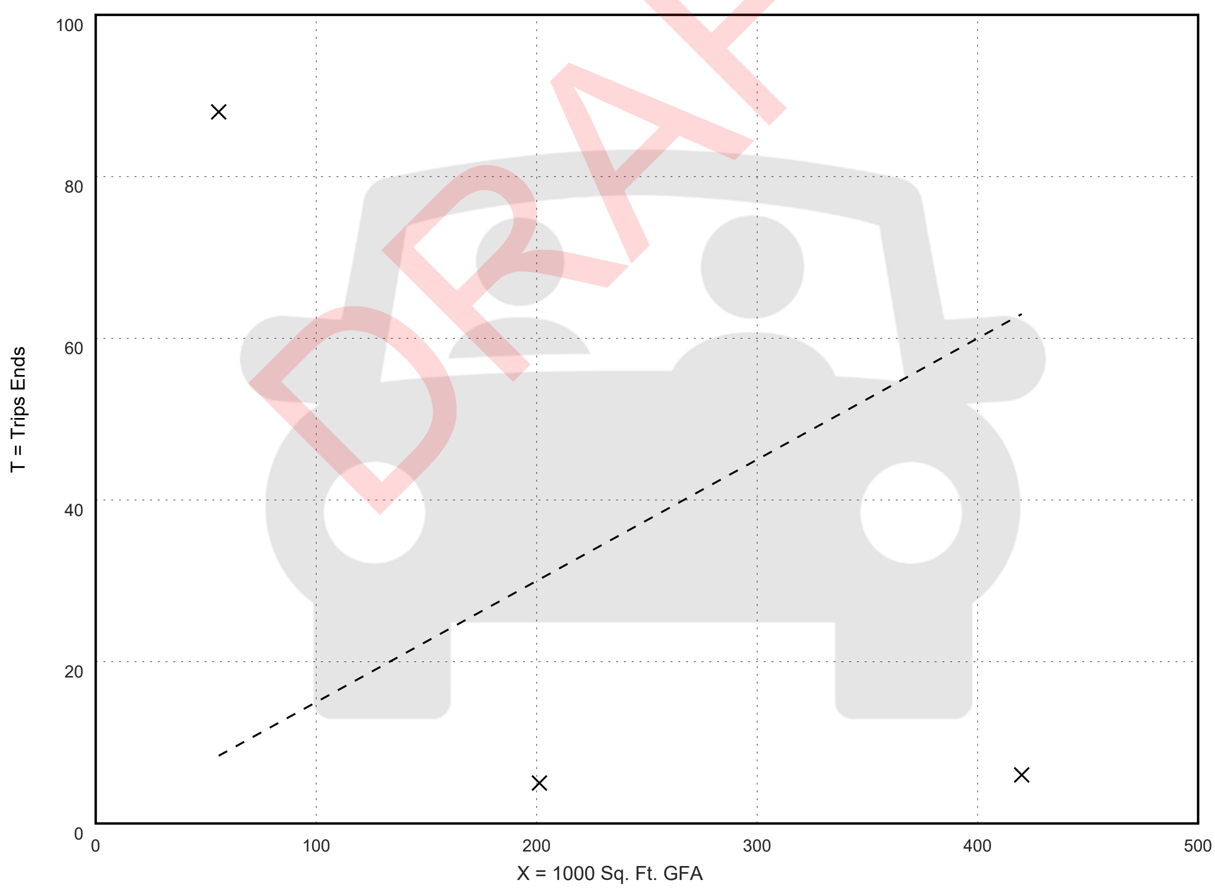
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 226
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.01 - 1.58	0.53

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

Warehousing
(150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

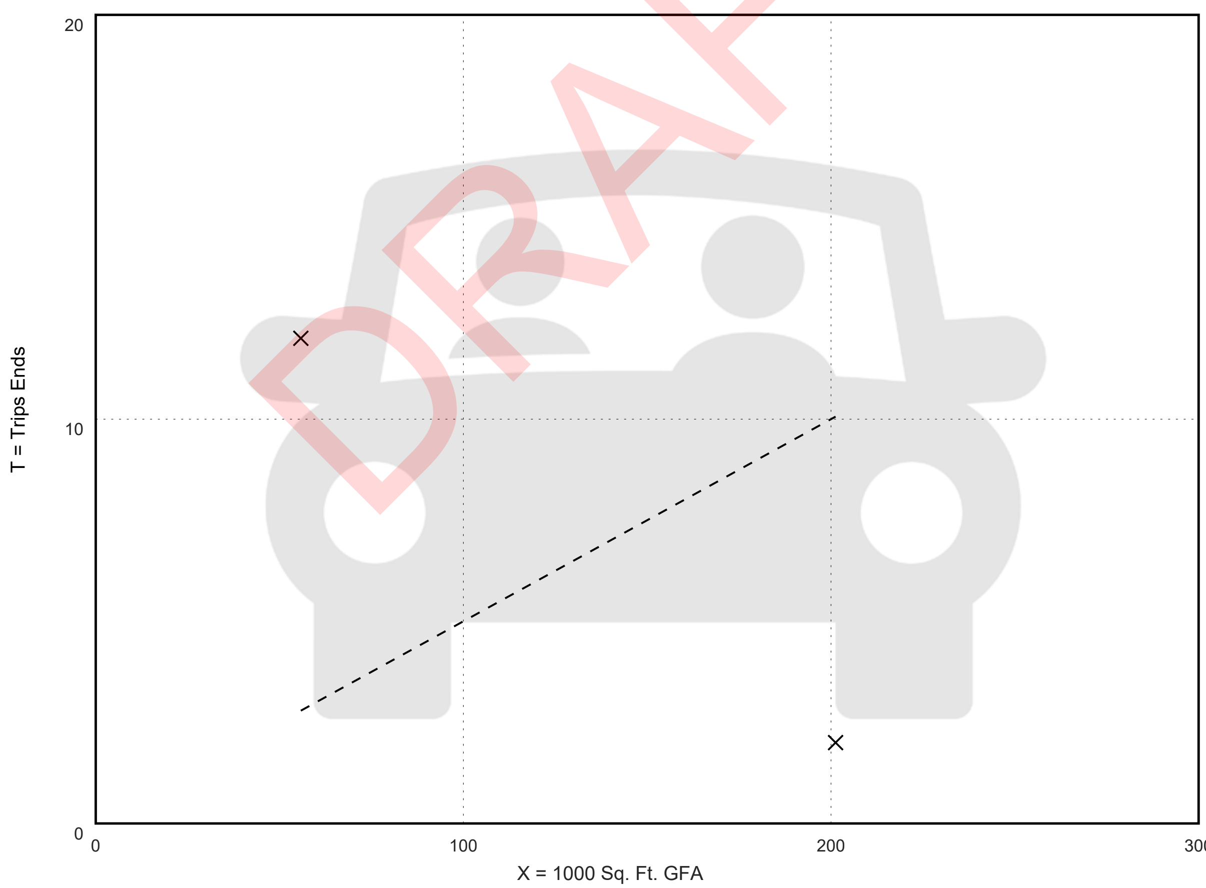
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 129
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.05	0.01 - 0.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Warehousing
(150)

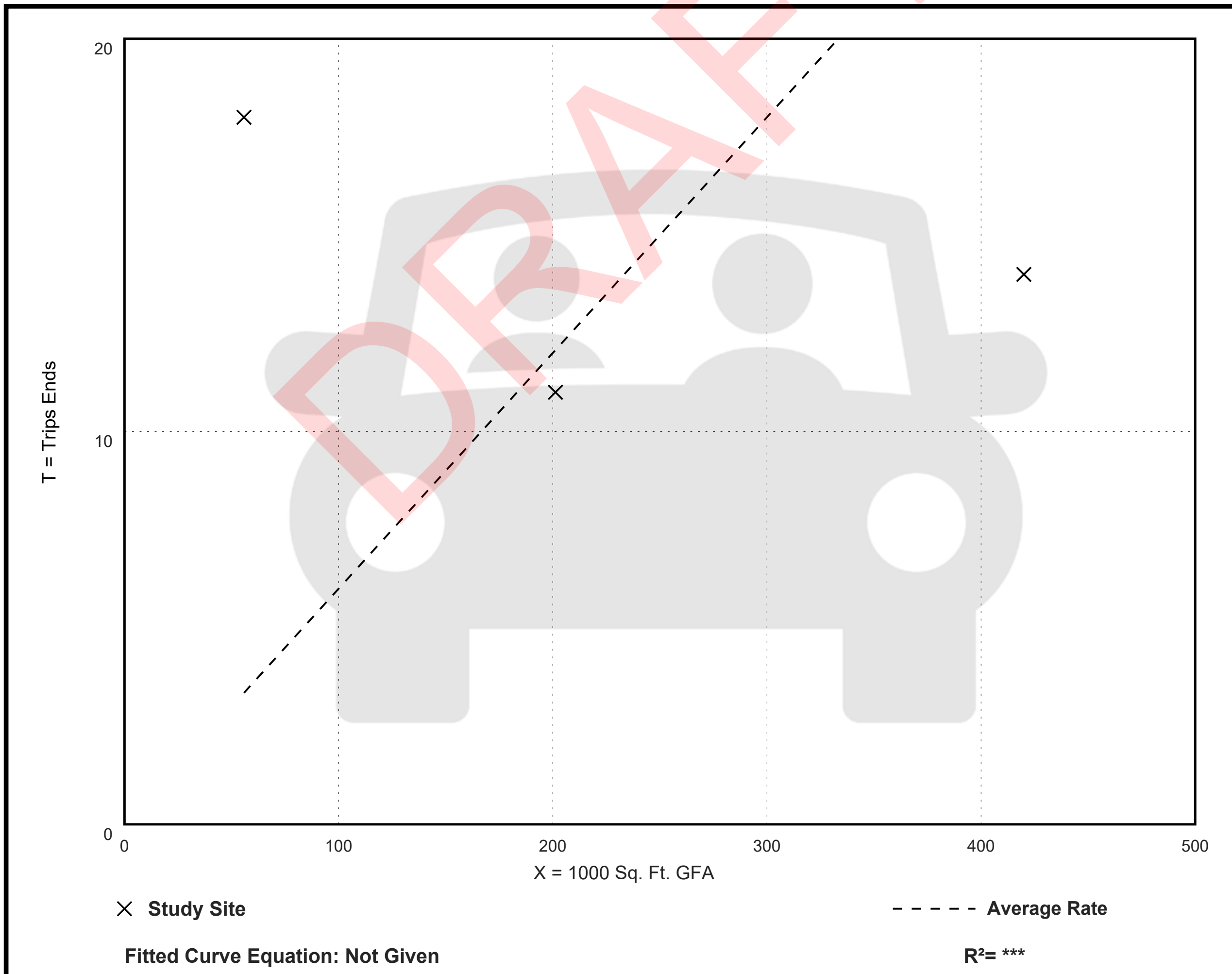
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 226
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.06	0.03 - 0.32	0.10

Data Plot and Equation



Warehousing
(150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

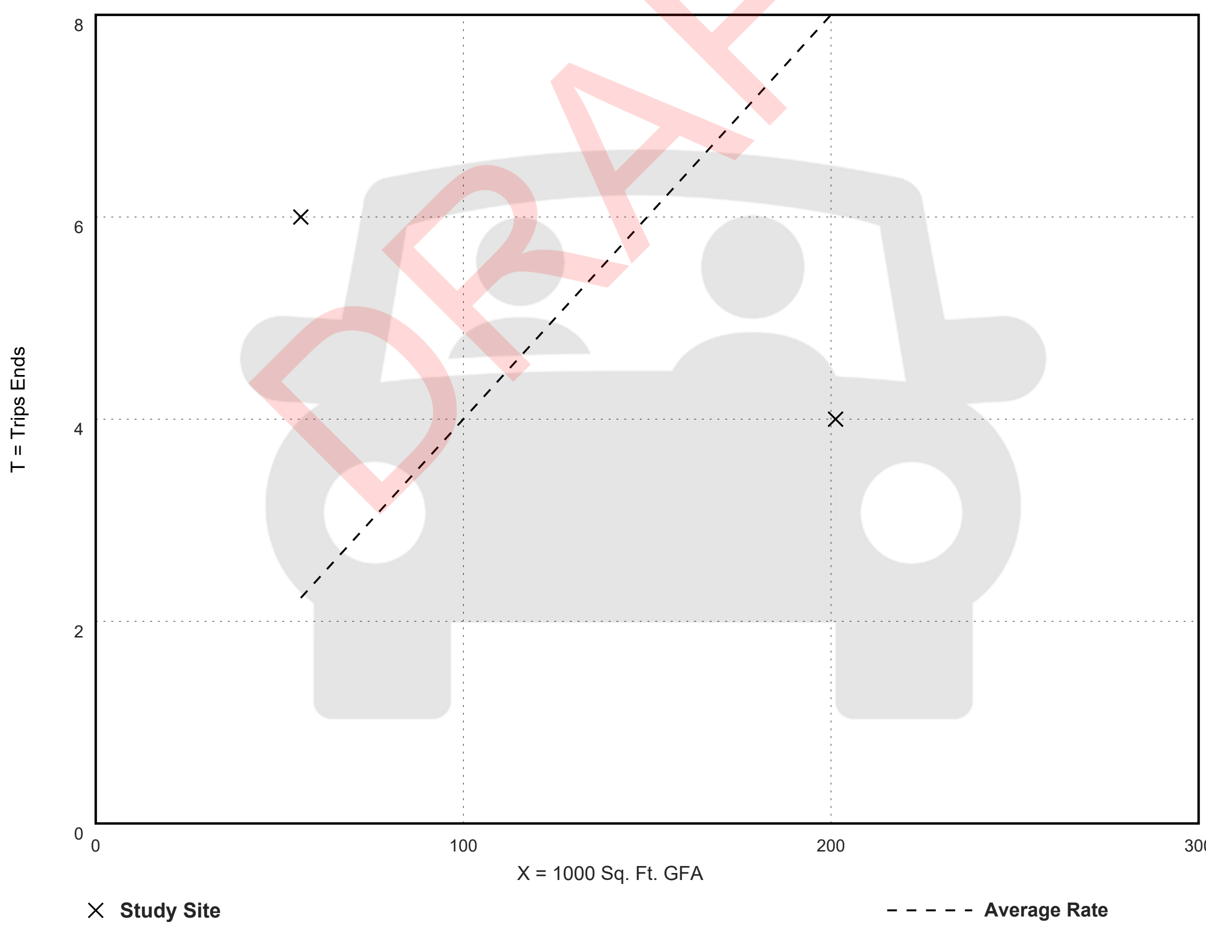
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 129
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.04	0.02 - 0.11	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Warehousing
(150)

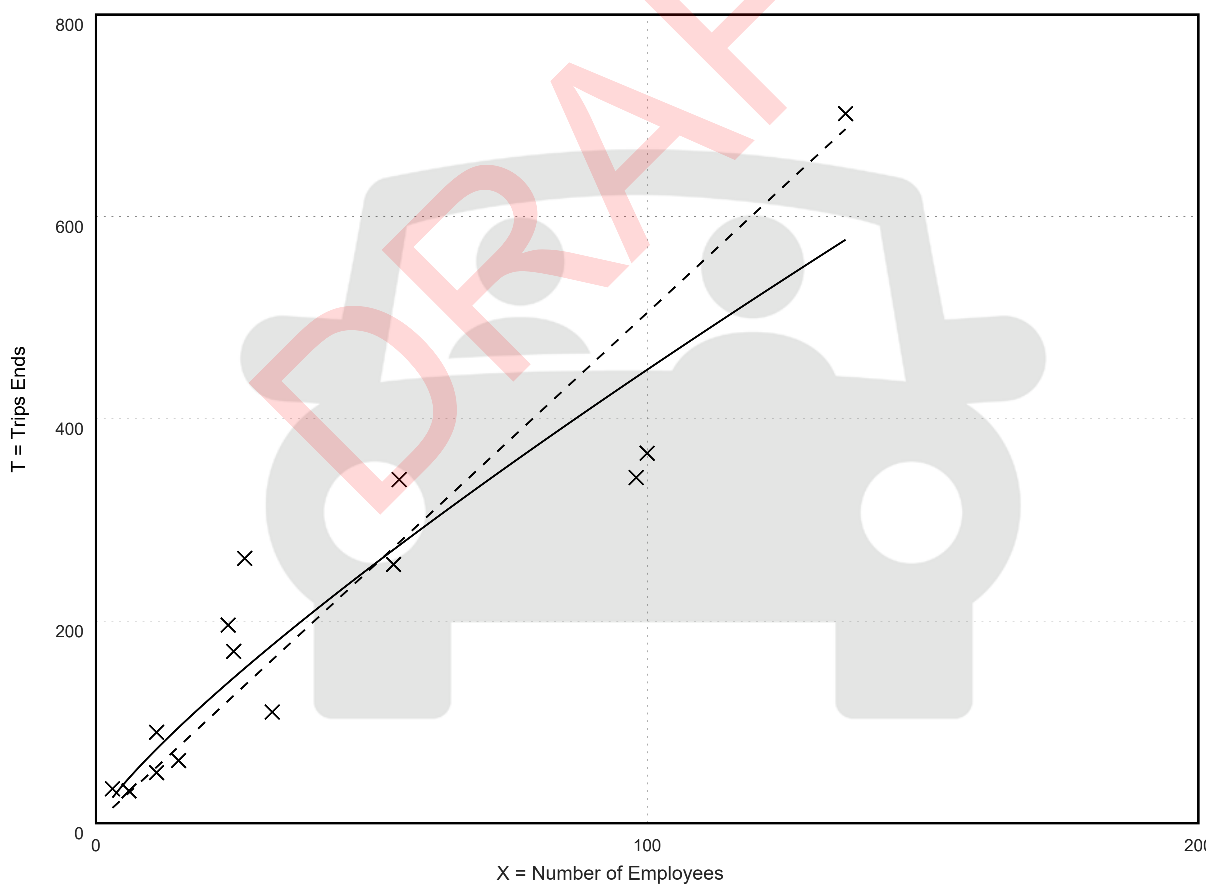
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Employees: 43
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
5.05	3.44 - 11.33	1.77

Data Plot and Equation



× **Study Site** ——— **Fitted Curve** - - - - **Average Rate**

Fitted Curve Equation: Ln(T) = 0.82 Ln(X) + 2.33 **R^2= 0.88**

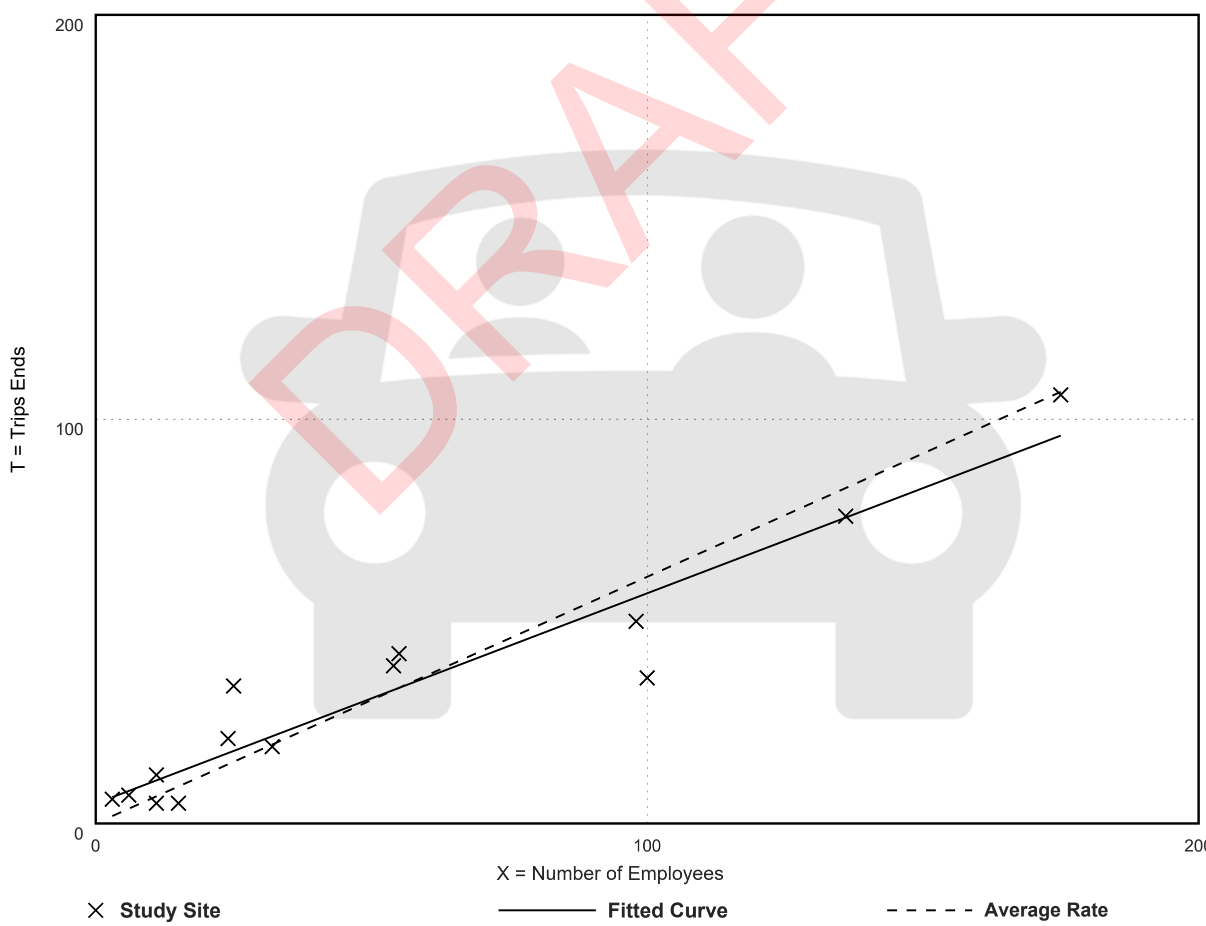
Warehousing
(150)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Employees: 53
Directional Distribution: 72% entering, 28% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.61	0.33 - 2.00	0.23

Data Plot and Equation



Fitted Curve Equation: T = 0.52(X) + 4.93 **R^2= 0.91**

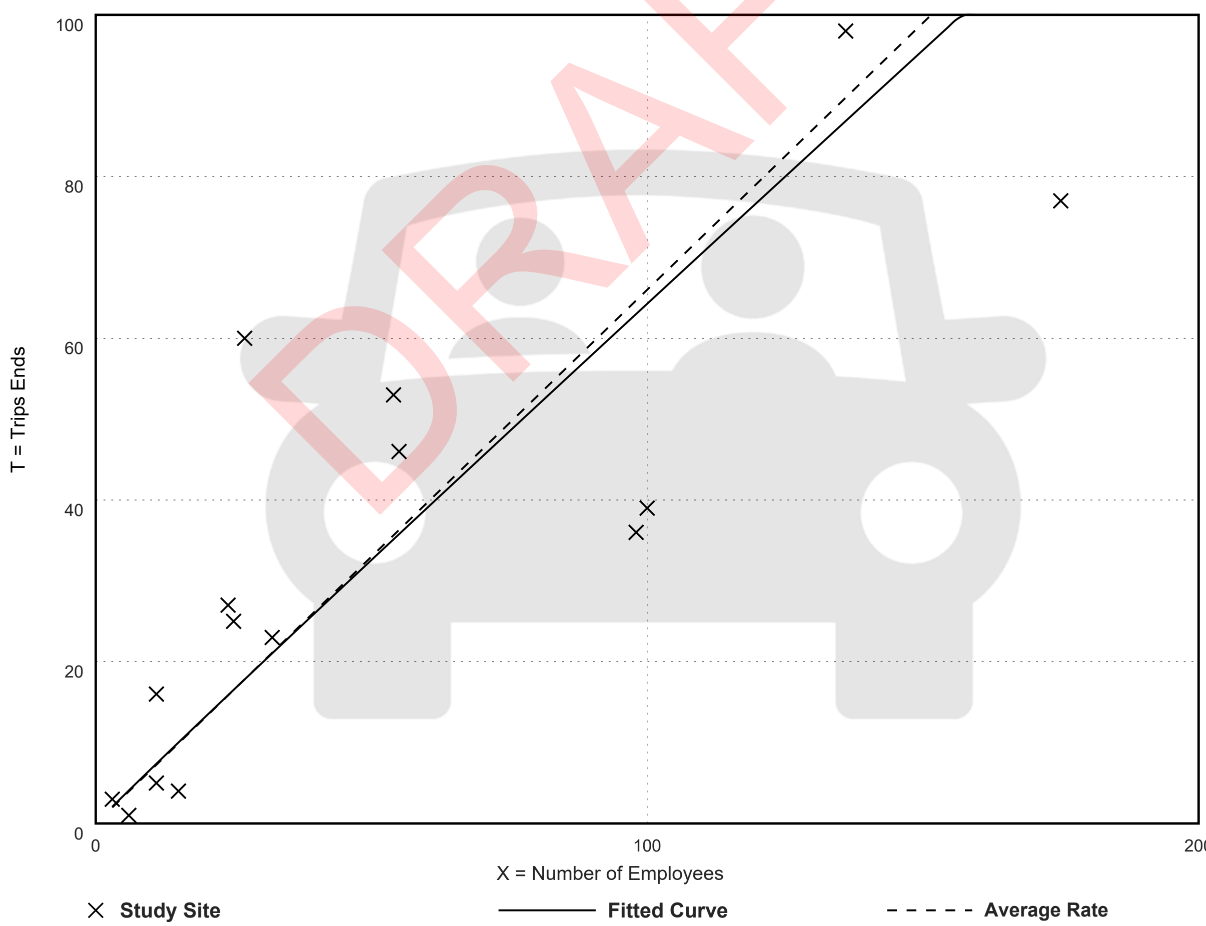
Warehousing
(150)

Vehicle Trip Ends vs:	**Employees**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	15
Avg. Num. of Employees:	51
Directional Distribution:	36% entering, 64% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.66	0.17 - 2.22	0.40

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.98 Ln(X) - 0.35

R^2= 0.74

Warehousing
(150)

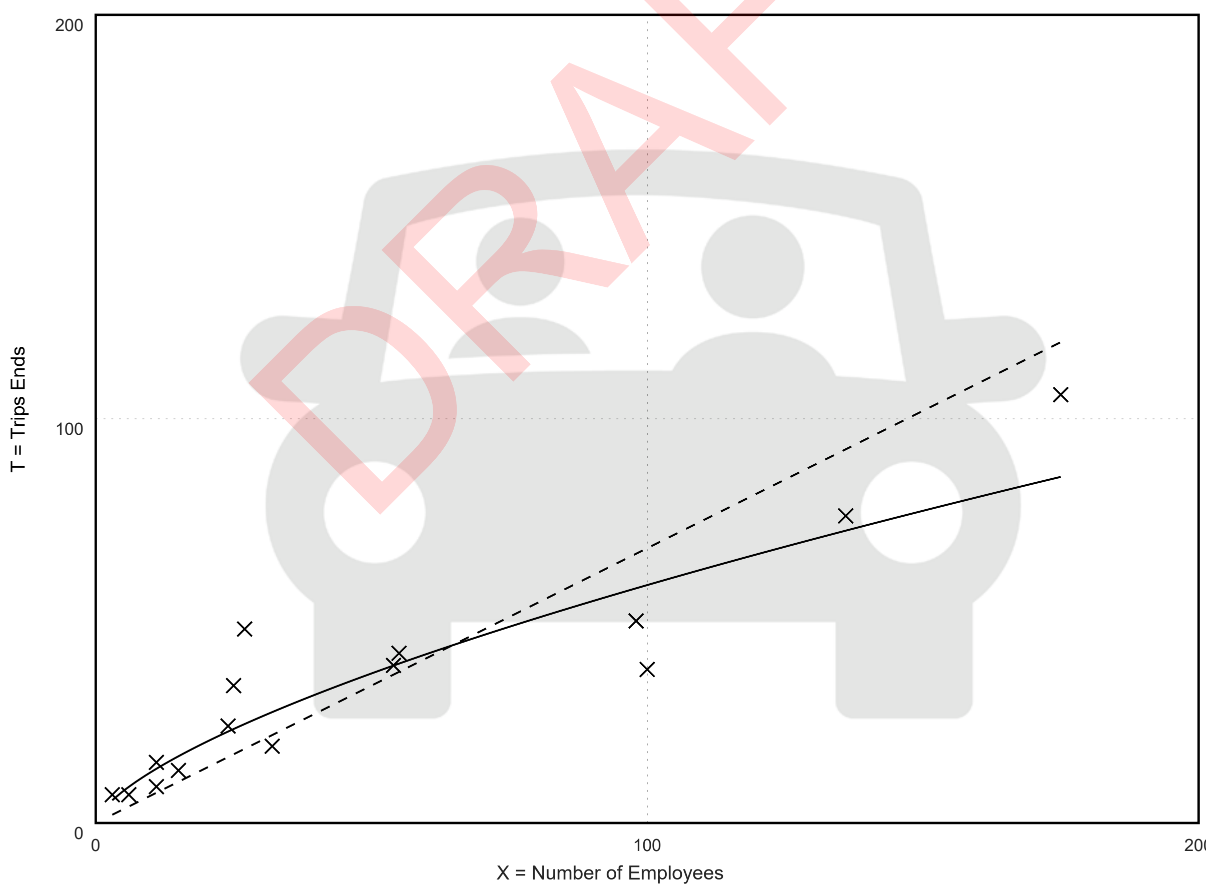
Vehicle Trip Ends vs: Employees
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 15
Avg. Num. of Employees: 51
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.68	0.38 - 2.33	0.33

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.67 Ln(X) + 0.99$ **$R^2 = 0.87$**

Warehousing
(150)

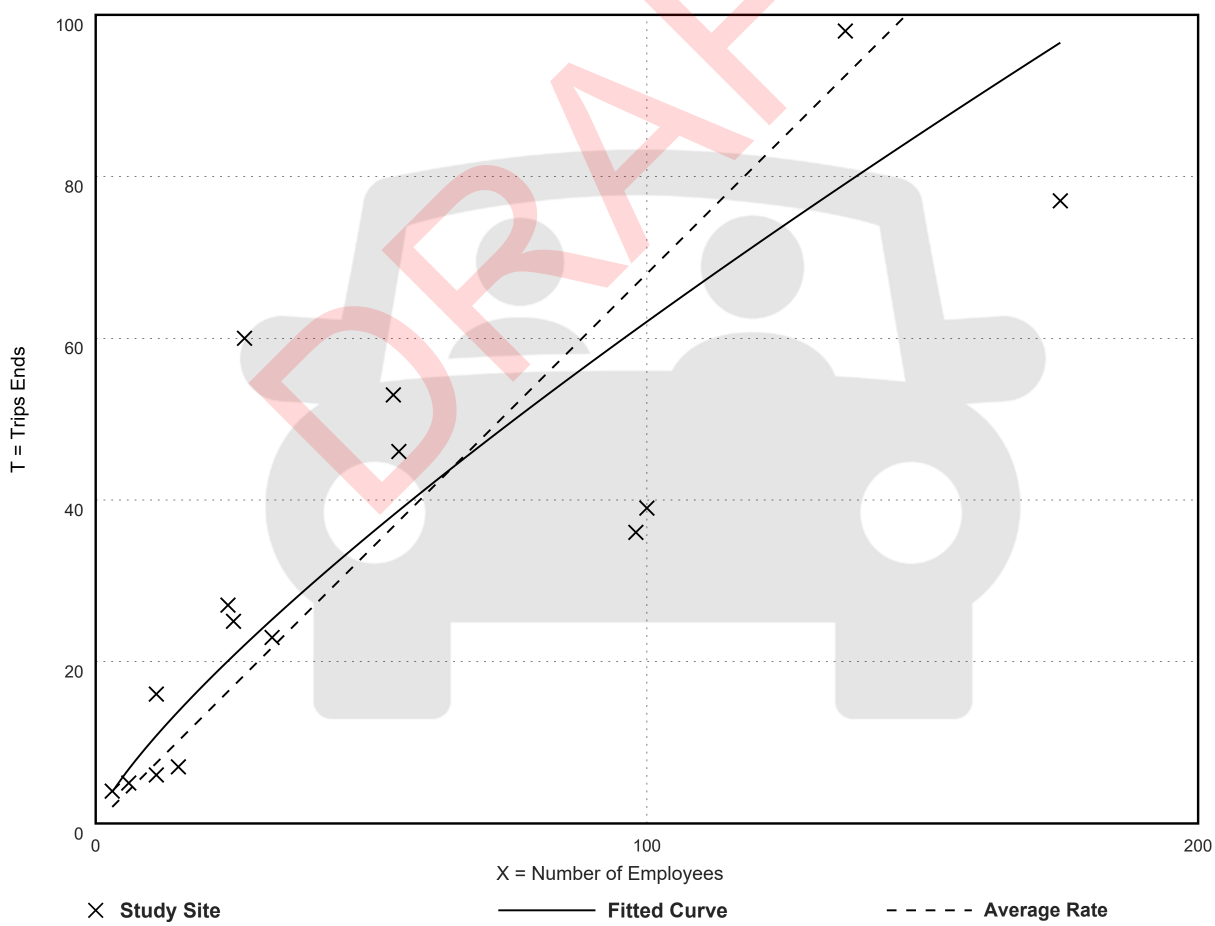
Vehicle Trip Ends vs: Employees
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 15
Avg. Num. of Employees: 51
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.68	0.37 - 2.22	0.40

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.79\ Ln(X) + 0.49$

R^2= 0.80

Warehousing
(150)

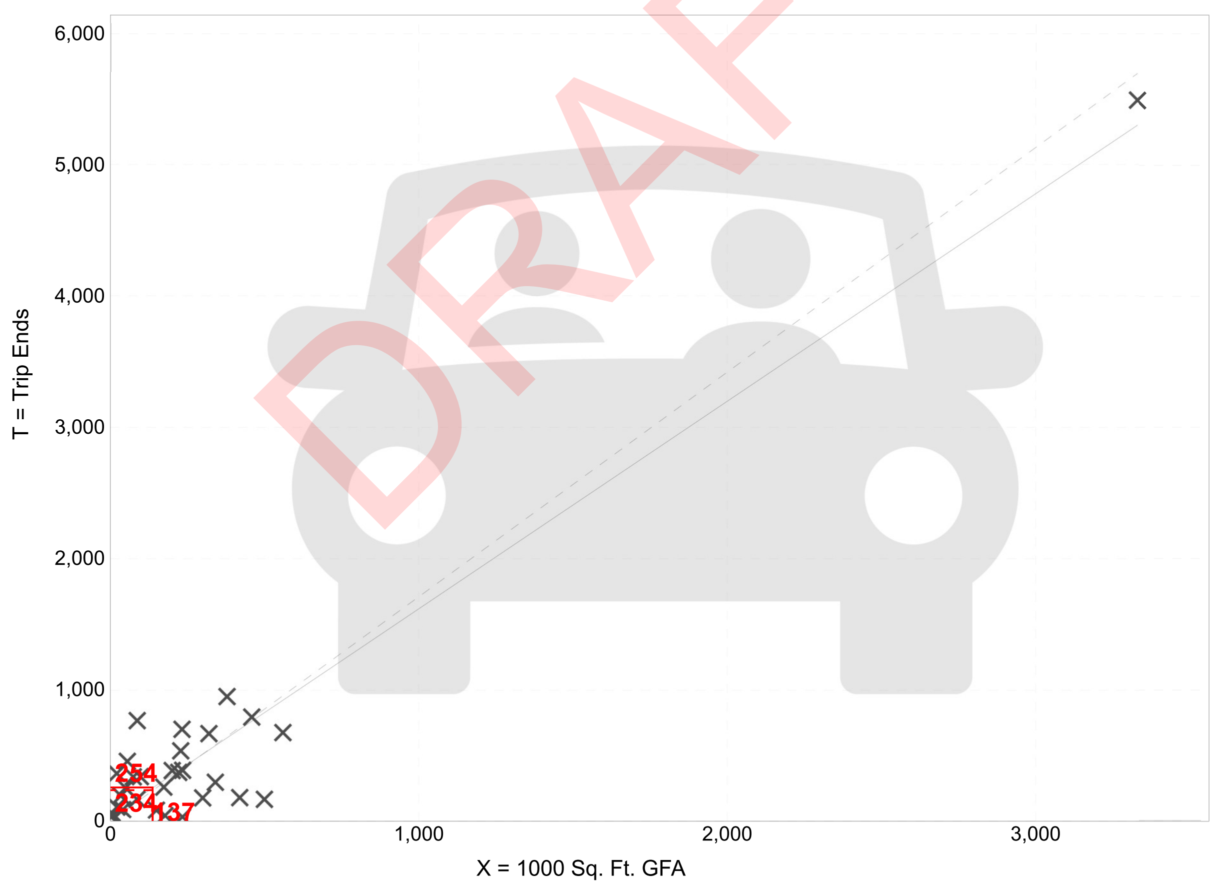
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 292
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: T = 1.58(X) + 38.29 **R^2= 0.92**

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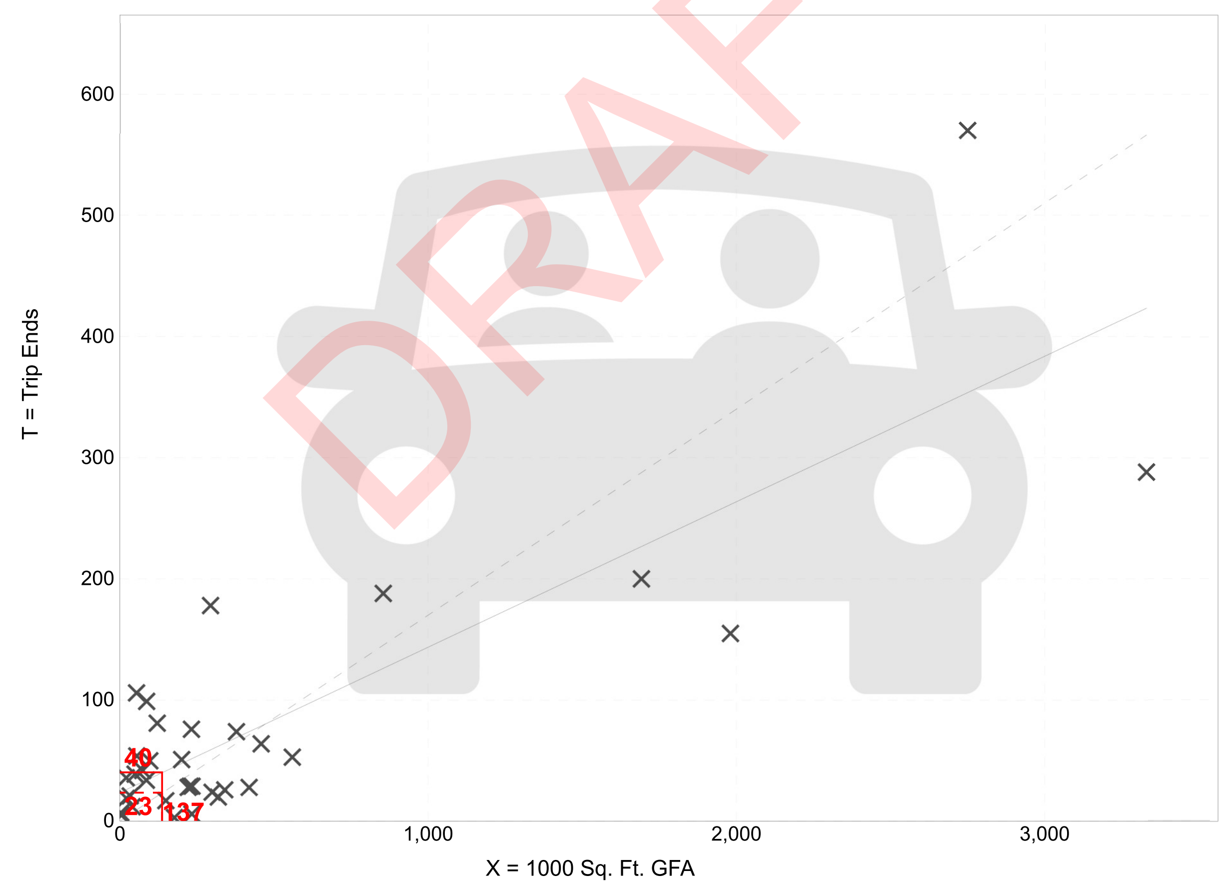
Warehousing
(150)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	36
Avg. 1000 Sq. Ft. GFA:	448
Directional Distribution:	77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



Fitted Curve Equation: T = 0.12(X) + 23.62 **R^2= 0.69**

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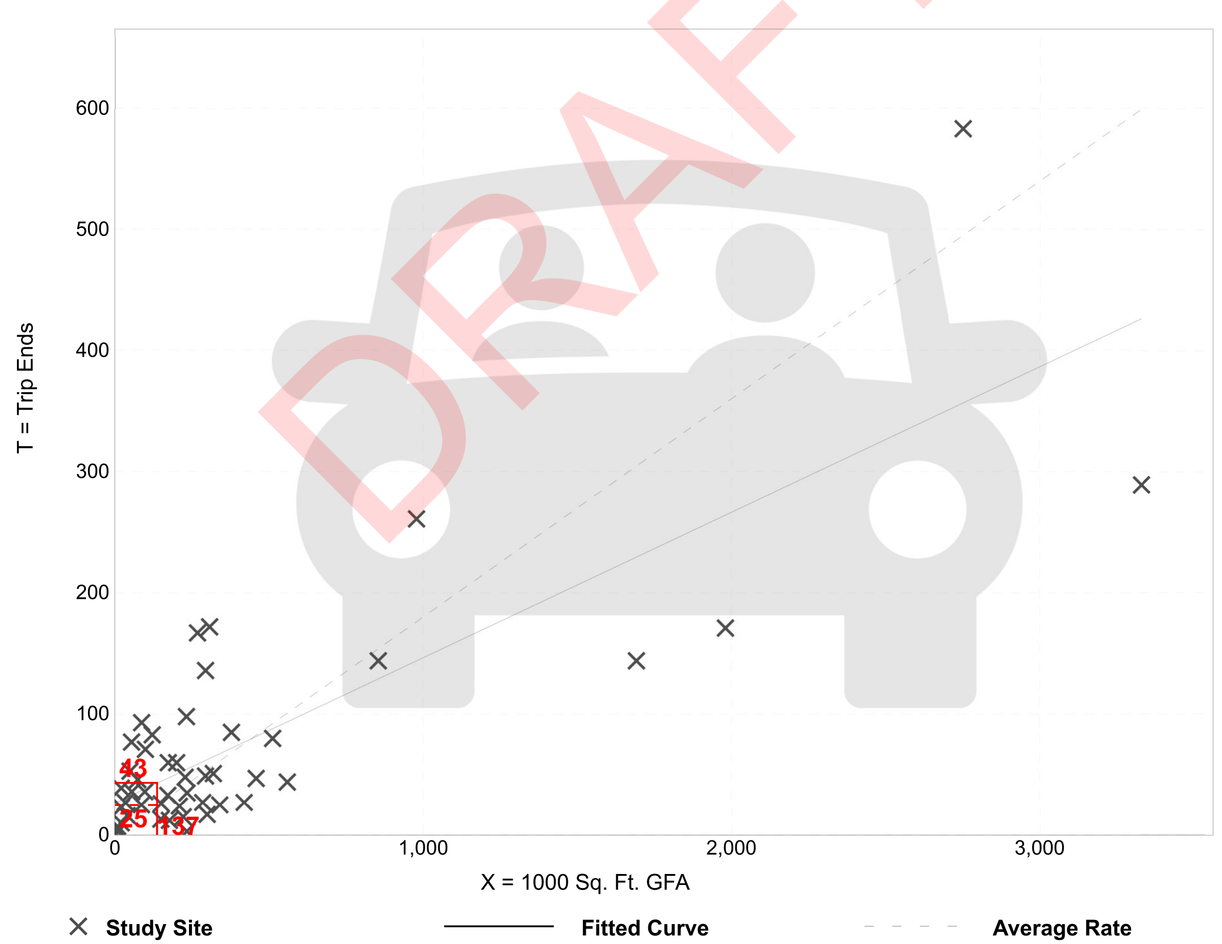
Warehousing
(150)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	49
Avg. 1000 Sq. Ft. GFA:	400
Directional Distribution:	28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



Fitted Curve Equation: $T = 0.12(X) + 26.48$

R^2= 0.65

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Warehousing
(150)

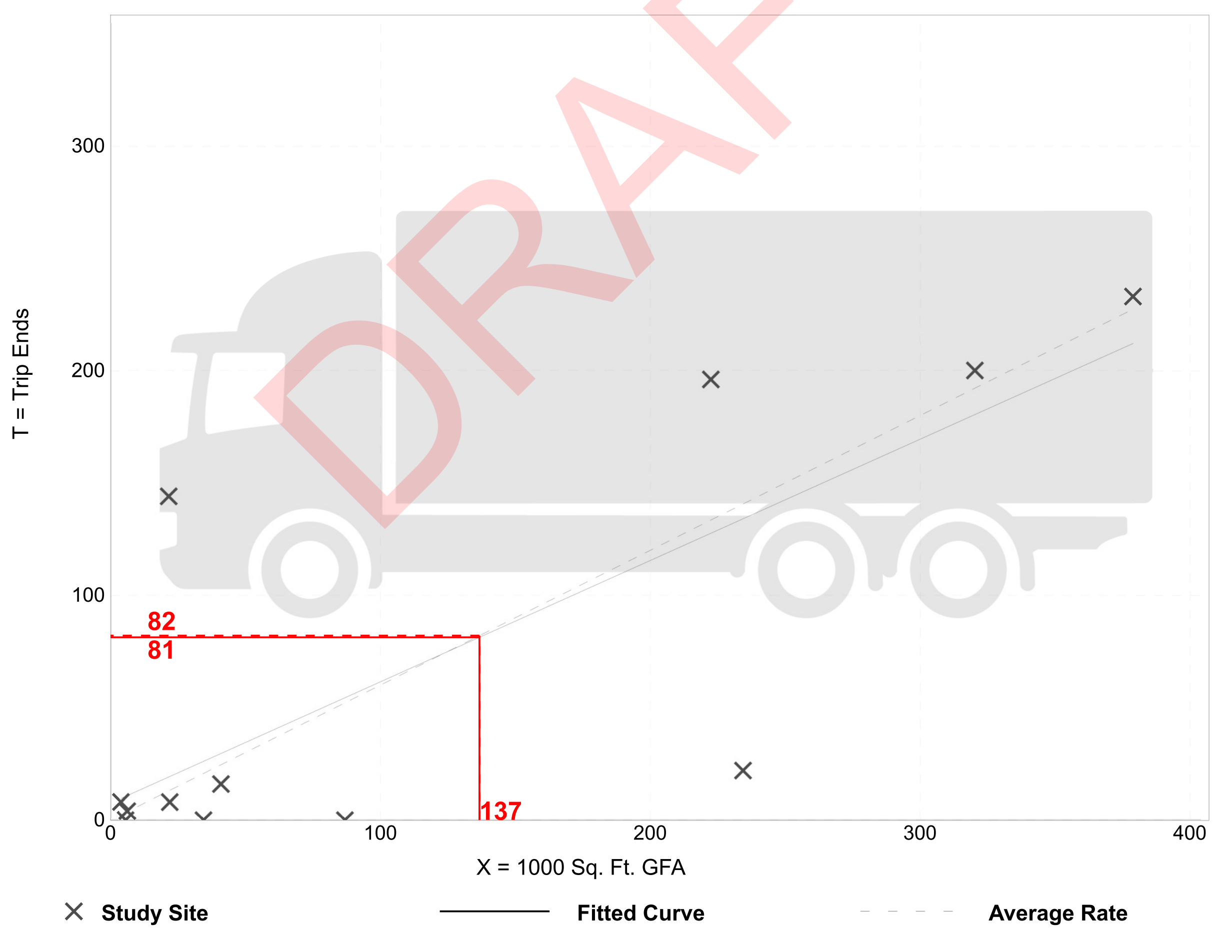
Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 12
Avg. 1000 Sq. Ft. GFA: 115
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.60	0.00 - 6.66	0.86

Data Plot and Equation



Fitted Curve Equation: T = 0.54(X) + 7.47 **R^2= 0.61**

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Warehousing
(150)

Truck Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 309
Directional Distribution: 52% entering, 48% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.02	0.00 - 0.69	0.05

Data Plot and Equation

× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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Warehousing
(150)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	23
Avg. 1000 Sq. Ft. GFA:	308
Directional Distribution:	52% entering, 48% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.42	0.03

Data Plot and Equation

Fitted Curve Equation: Not Given

R^2= **

Trip Gen Manual, 11th Edition • Institute of Transportation Engineers

Land Use: 154
High-Cube Transload and Short-Term Storage Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

The HCWs included in this land use include transload and short-term storage facilities. A transload facility has the primary function of consolidation and distribution of pallet loads (or larger) for manufacturers, wholesalers, or retailers. A transload facility typically has little storage duration, high throughput, and its operations are high efficiency. A short-term HCW is a distribution facility often with custom/special features built into the structure for the movement of large volumes of freight with only short-term storage of products.

Some limited assembly and repackaging may occur within the facility.

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

Warehousing (Land Use 150), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related land uses.

The number of dock doors at a HCW is a potential independent variable. Future data submissions should include that information.

Additional Data

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled "High-Cube Warehouse Vehicle Trip Generation Analysis," published in October 2016. The results of this study are posted on the ITE website at http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 2000s, and the 2010s in Alberta (CAN), California, Florida, Michigan, New Jersey, Texas, and Washington.

Source Numbers

331, 605, 619, 642, 645, 649, 739, 750, 752, 903, 904, 941, 942, 943, 969

High-Cube Transload and Short-Term Storage Warehouse (154)

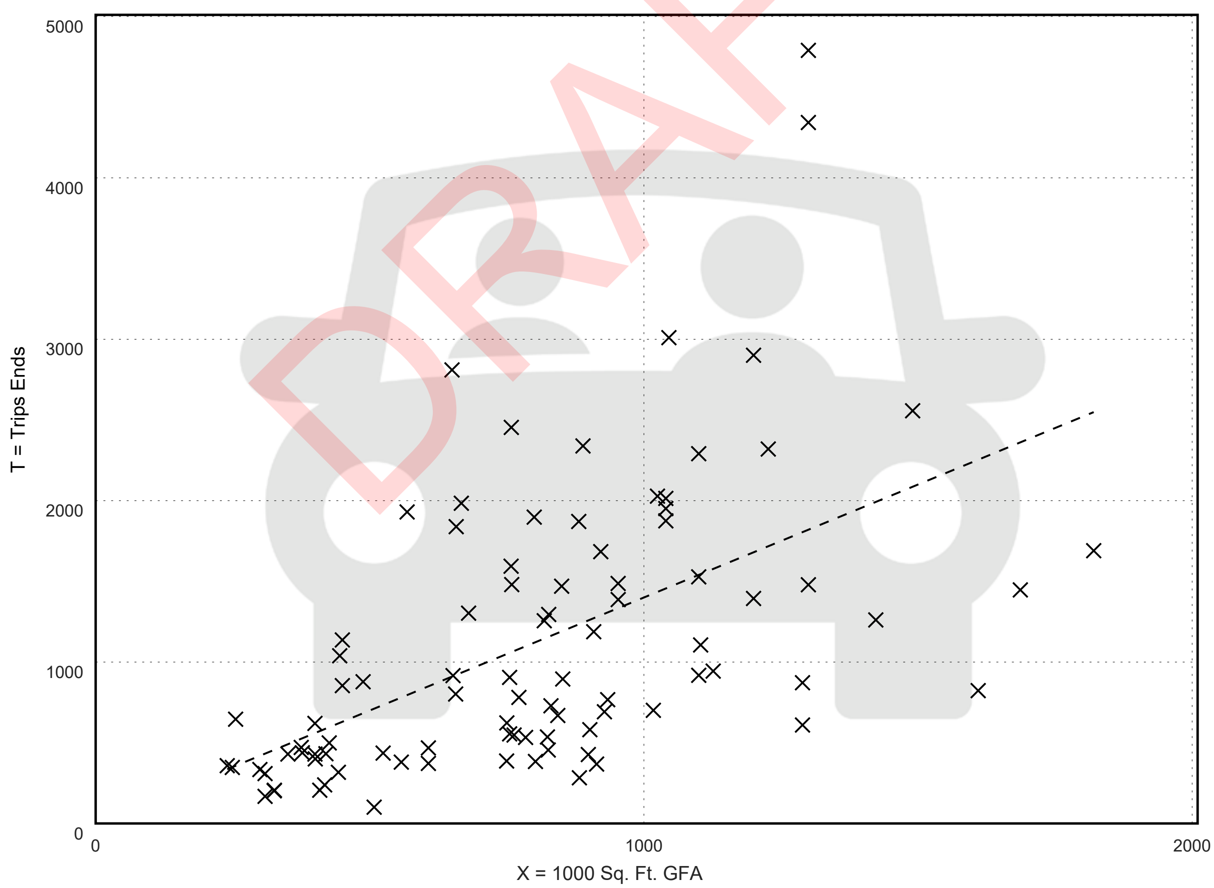
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 91
Avg. 1000 Sq. Ft. GFA: 798
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.40	0.20 - 4.32	0.86

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

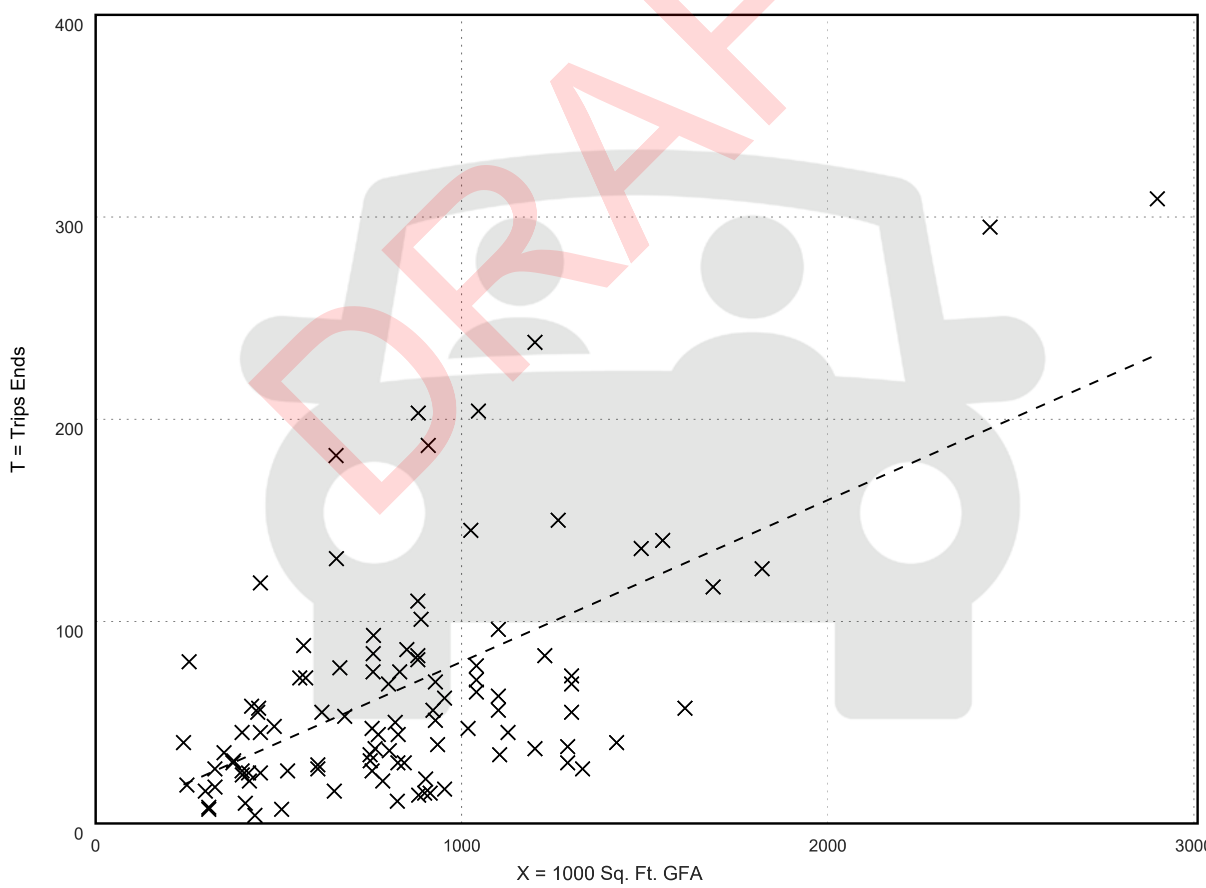
High-Cube Transload and Short-Term Storage Warehouse (154)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	102
Avg. 1000 Sq. Ft. GFA:	846
Directional Distribution:	77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.08	0.01 - 0.31	0.05

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

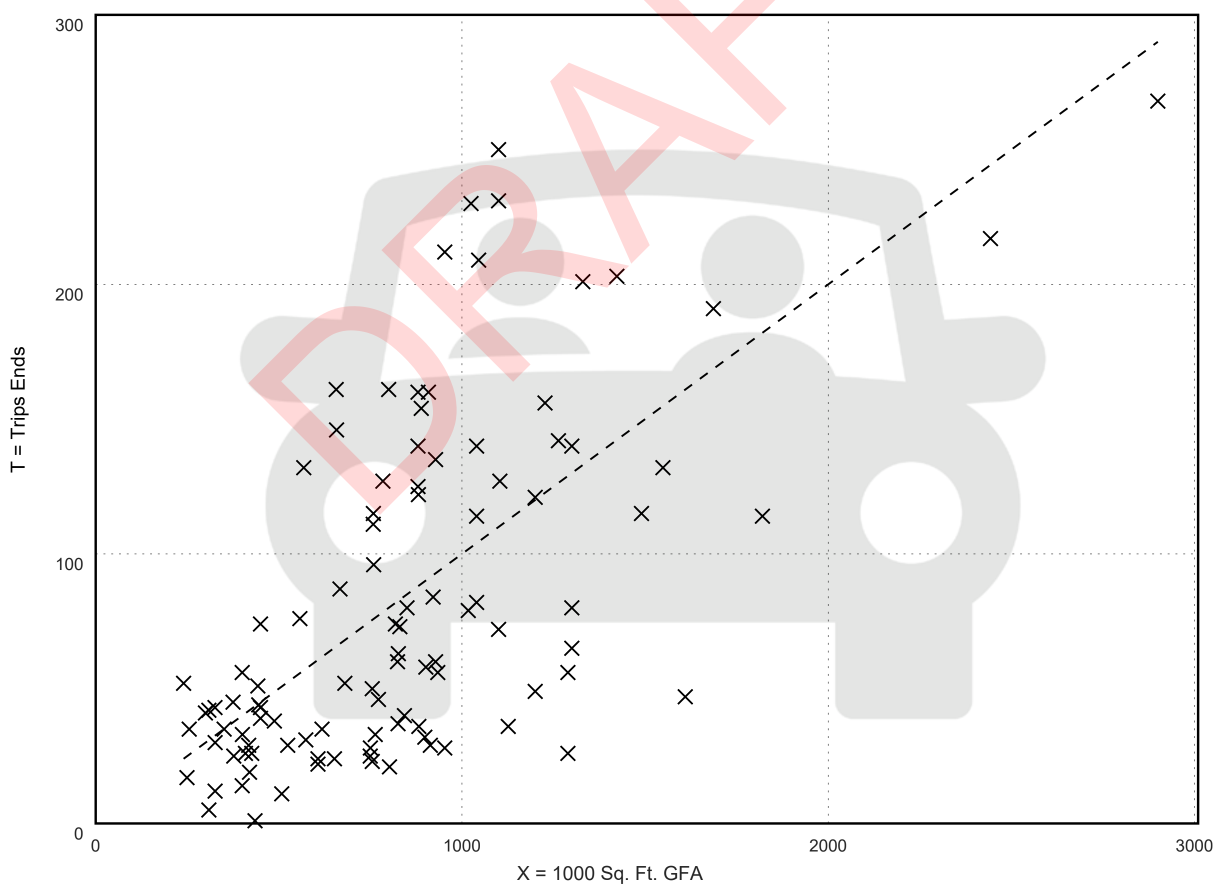
High-Cube Transload and Short-Term Storage Warehouse (154)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	103
Avg. 1000 Sq. Ft. GFA:	840
Directional Distribution:	28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.10	0.00 - 0.25	0.06

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Transload and Short-Term Storage Warehouse (154)

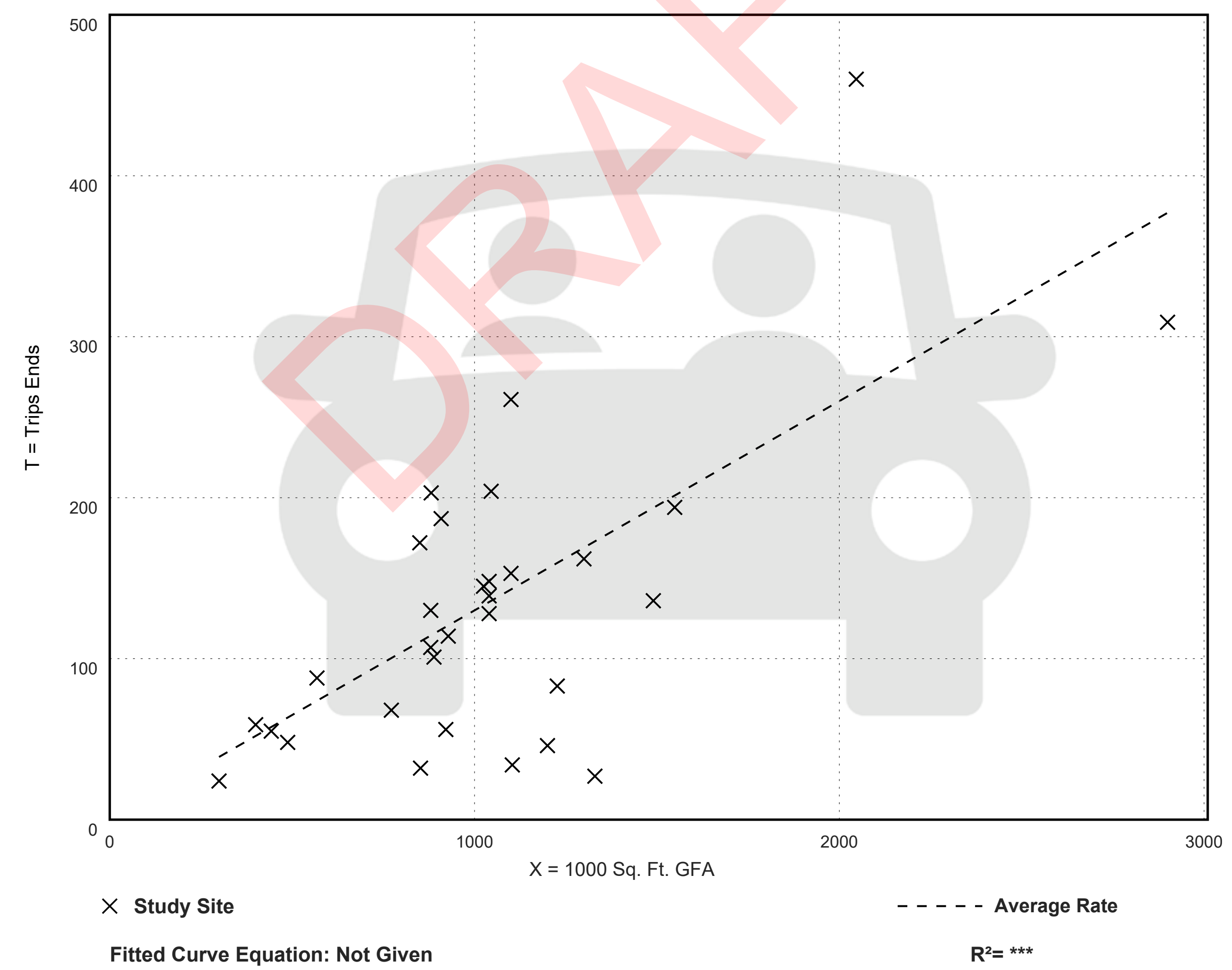
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 1048
Directional Distribution: 78% entering, 22% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.13	0.02 - 0.24	0.06

Data Plot and Equation



High-Cube Transload and Short-Term Storage Warehouse (154)

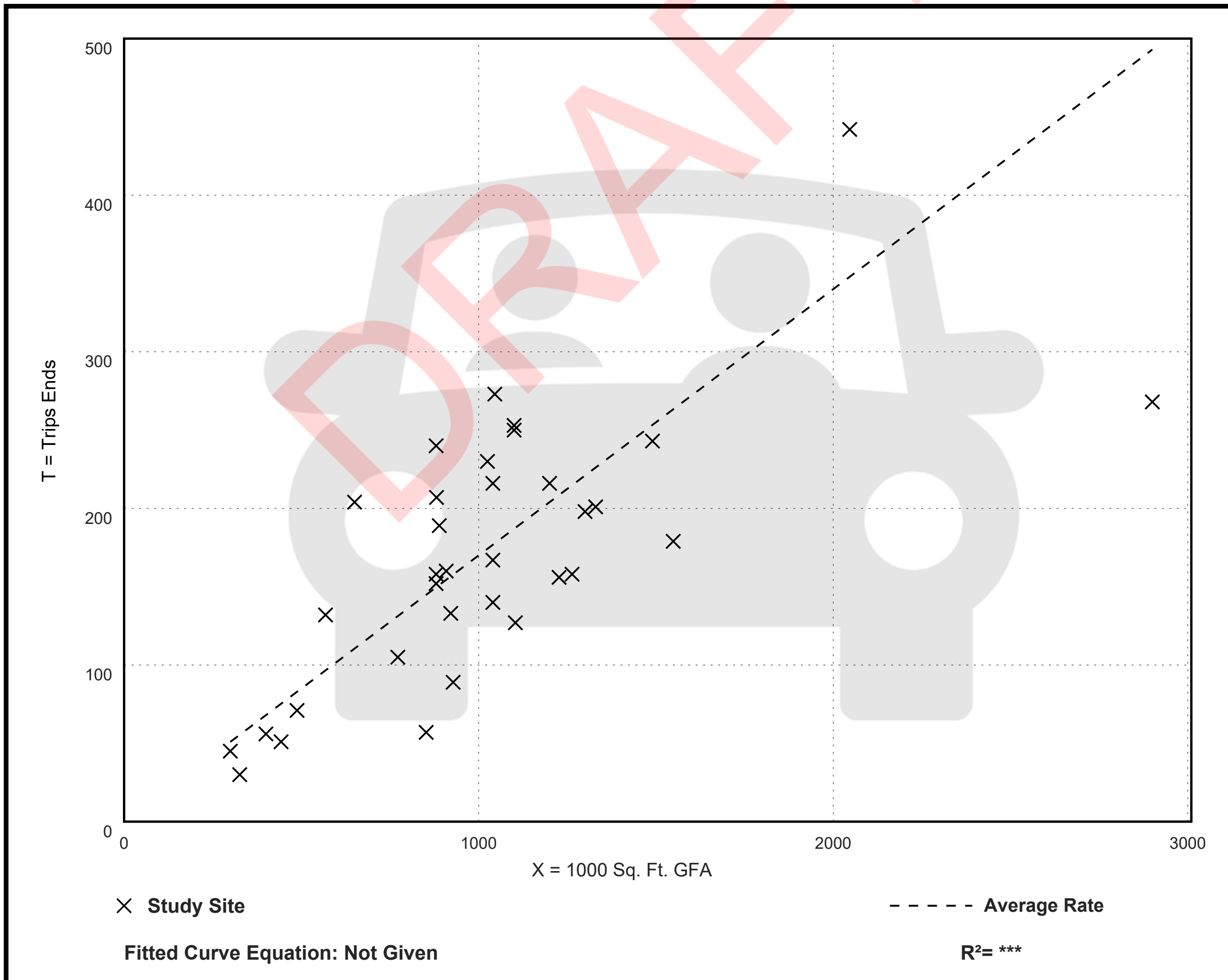
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 1023
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.07 - 0.31	0.06

Data Plot and Equation



High-Cube Transload and Short-Term Storage Warehouse (154)

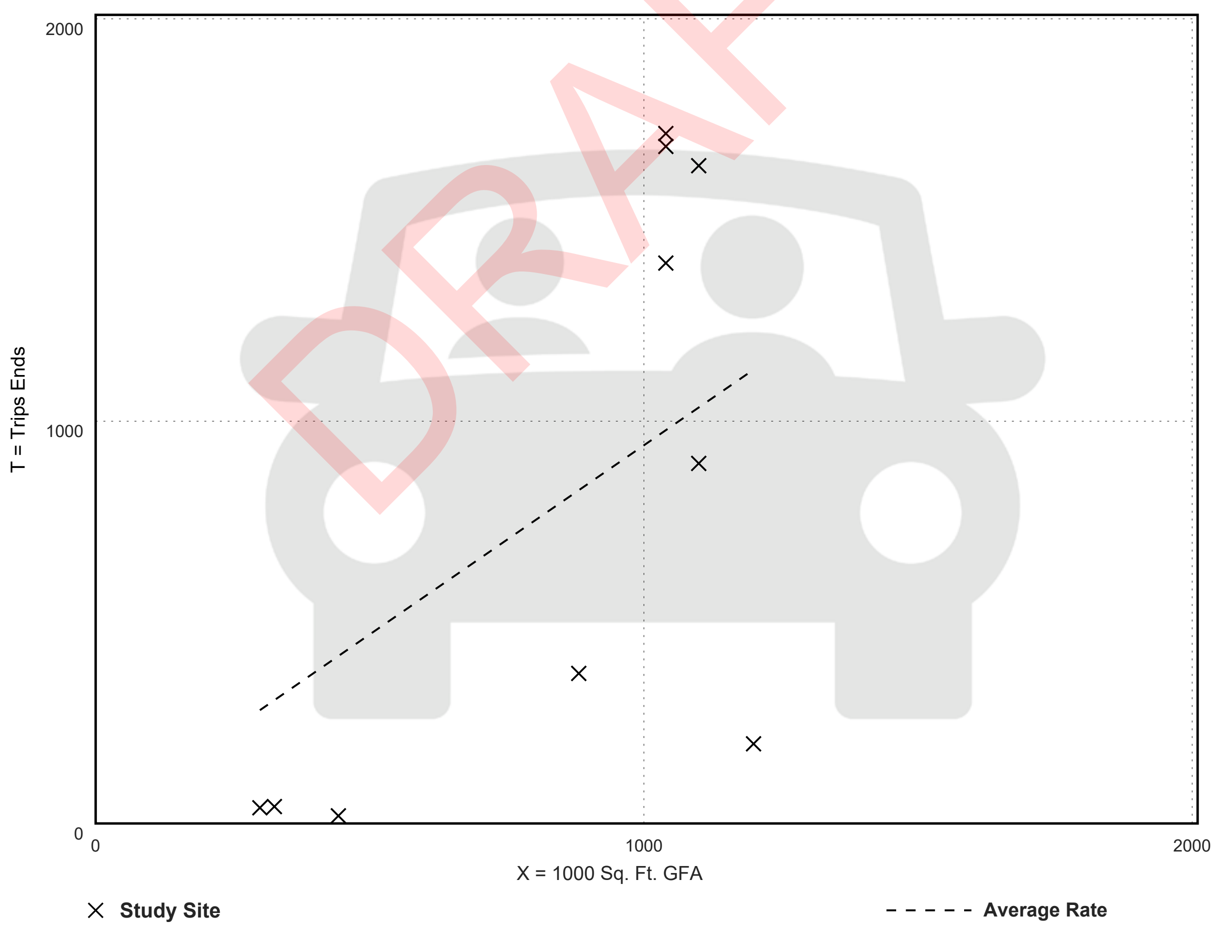
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 847
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.94	0.04 - 1.65	0.65

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= *****

High-Cube Transload and Short-Term Storage Warehouse (154)

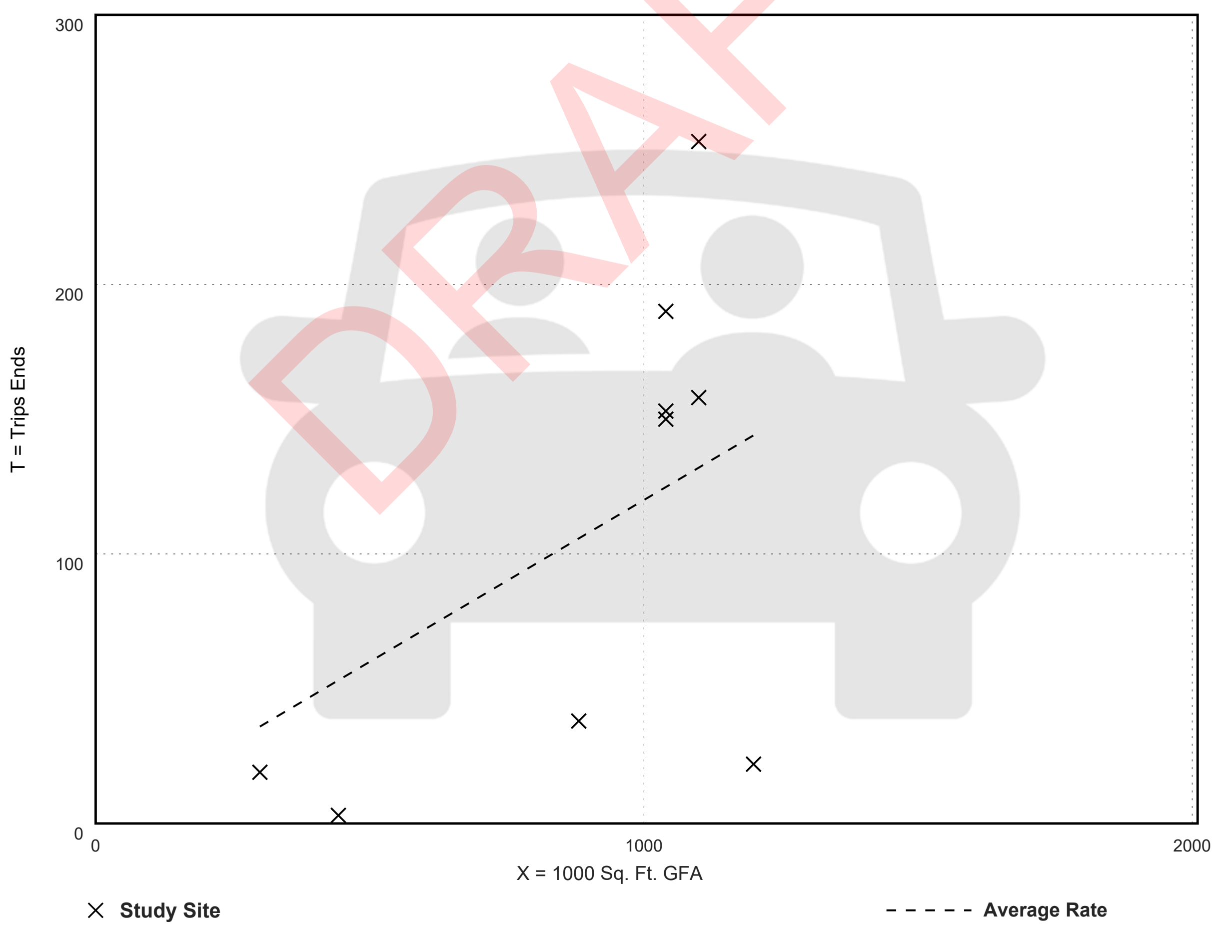
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. 1000 Sq. Ft. GFA: 905
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.12	0.01 - 0.23	0.08

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ***

High-Cube Transload and Short-Term Storage Warehouse (154)

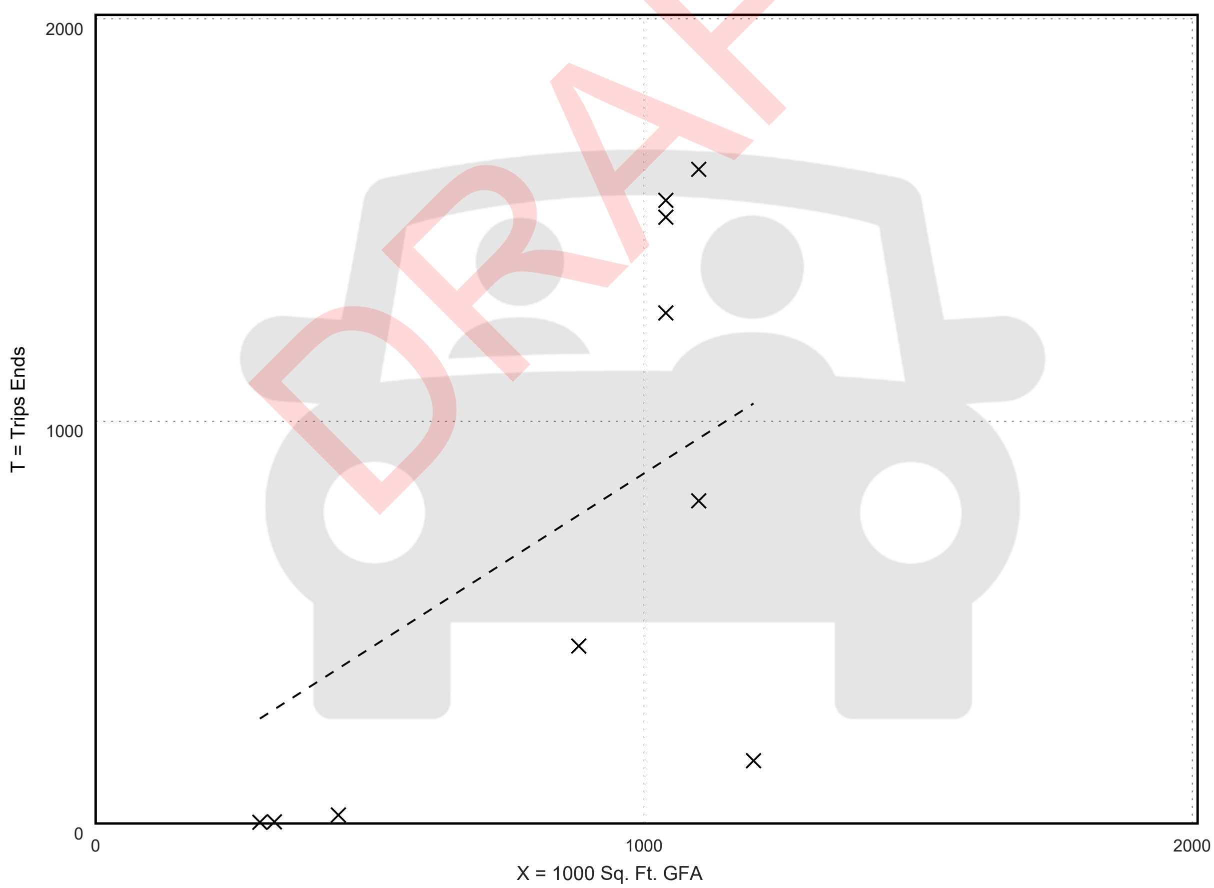
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 847
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.87	0.01 - 1.49	0.61

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Transload and Short-Term Storage Warehouse (154)

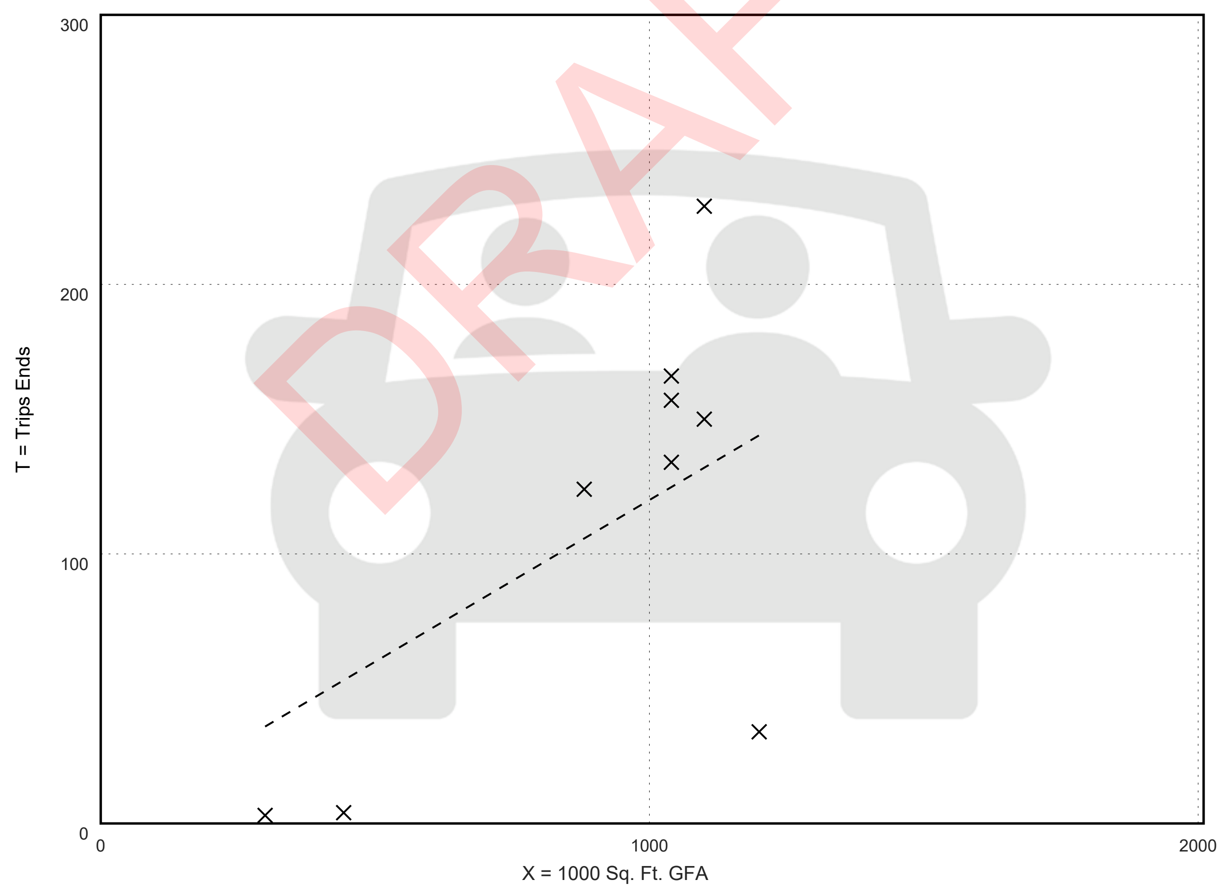
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. 1000 Sq. Ft. GFA: 905
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.12	0.01 - 0.21	0.07

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Transload and Short-Term Storage Warehouse
(154)

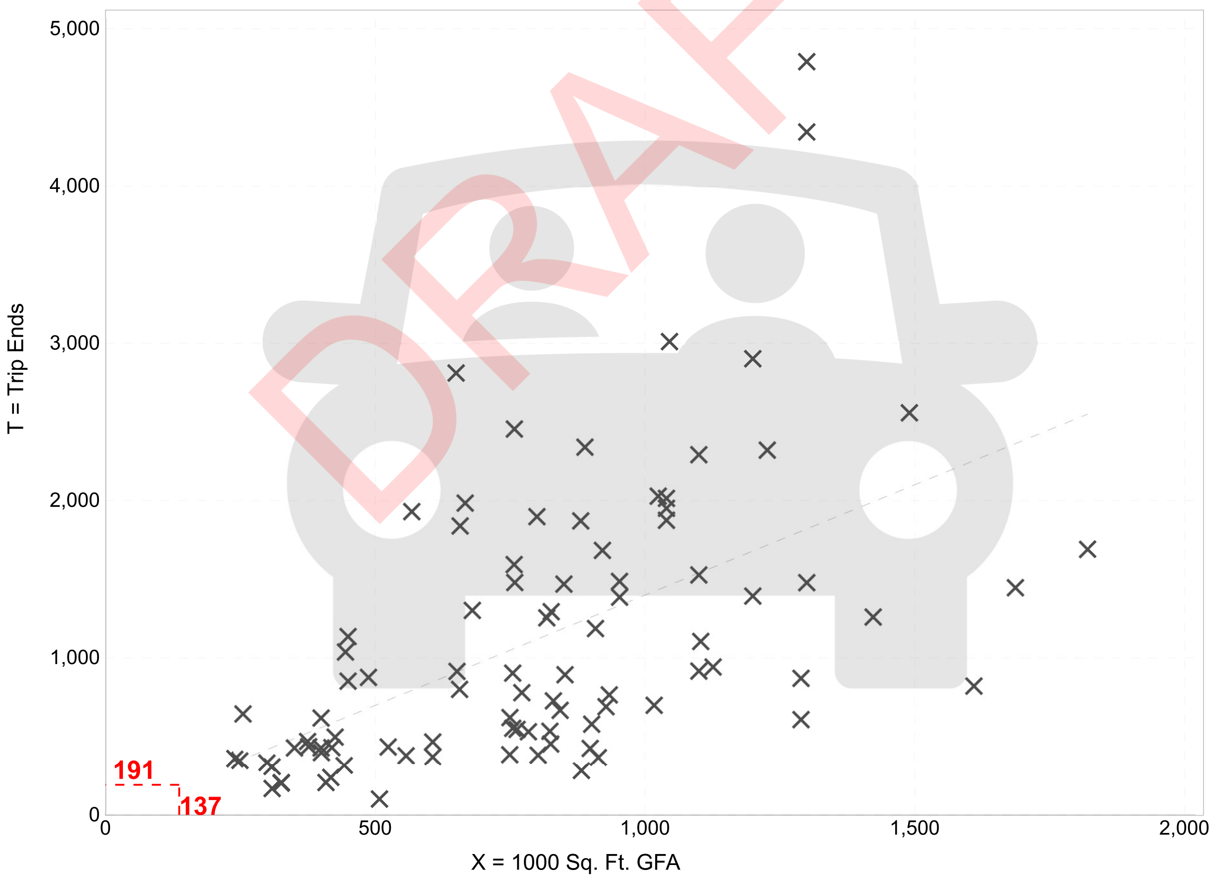
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 91
Avg. 1000 Sq. Ft. GFA: 798
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.40	0.20 - 4.32	0.86

Data Plot and Equation



× **Study Site** — — — **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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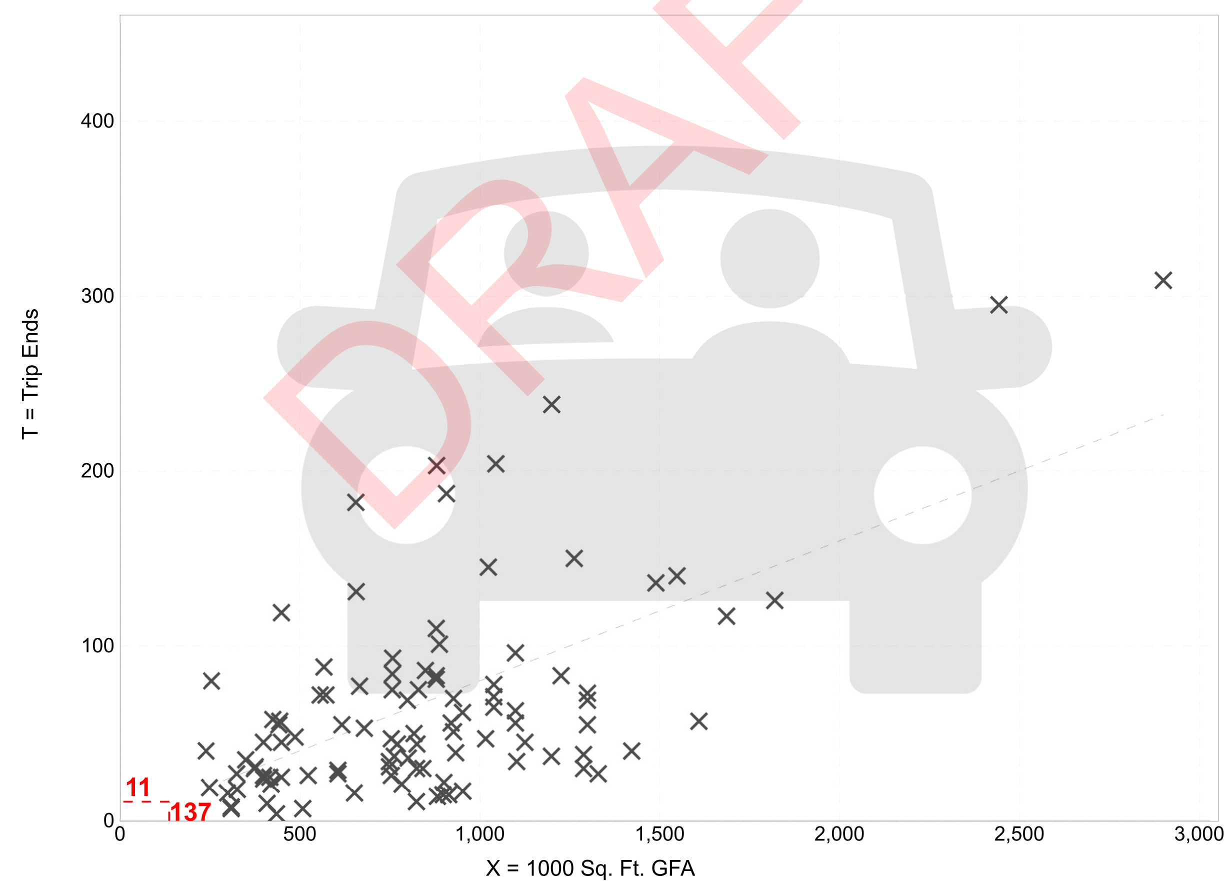
High-Cube Transload and Short-Term Storage Warehouse
(154)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	102
Avg. 1000 Sq. Ft. GFA:	846
Directional Distribution:	77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.08	0.01 - 0.31	0.05

Data Plot and Equation



Study Site

Average Rate

Fitted Curve Equation: Not Given

R^2= ****

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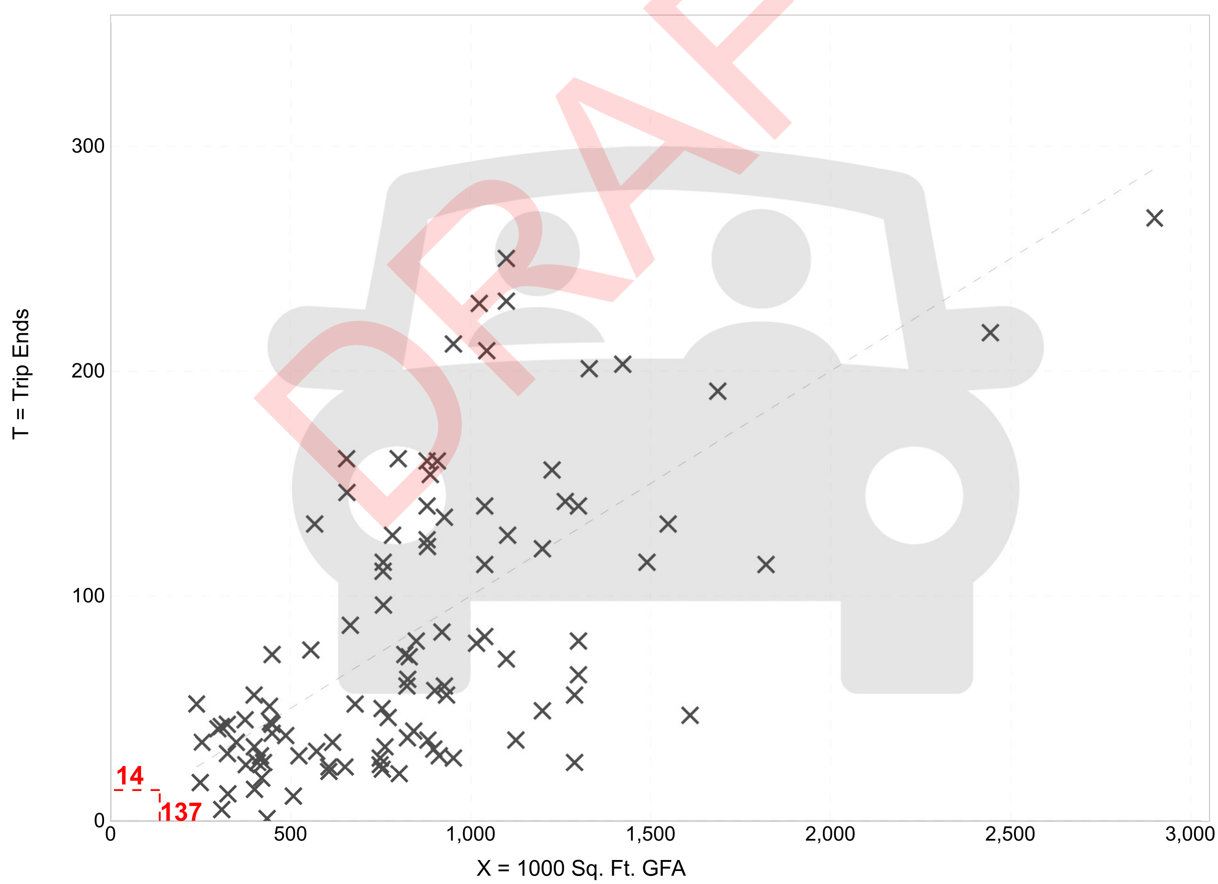
High-Cube Transload and Short-Term Storage Warehouse
(154)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	103
Avg. 1000 Sq. Ft. GFA:	840
Directional Distribution:	28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.10	0.00 - 0.25	0.06

Data Plot and Equation



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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High-Cube Transload and Short-Term Storage Warehouse
(154)

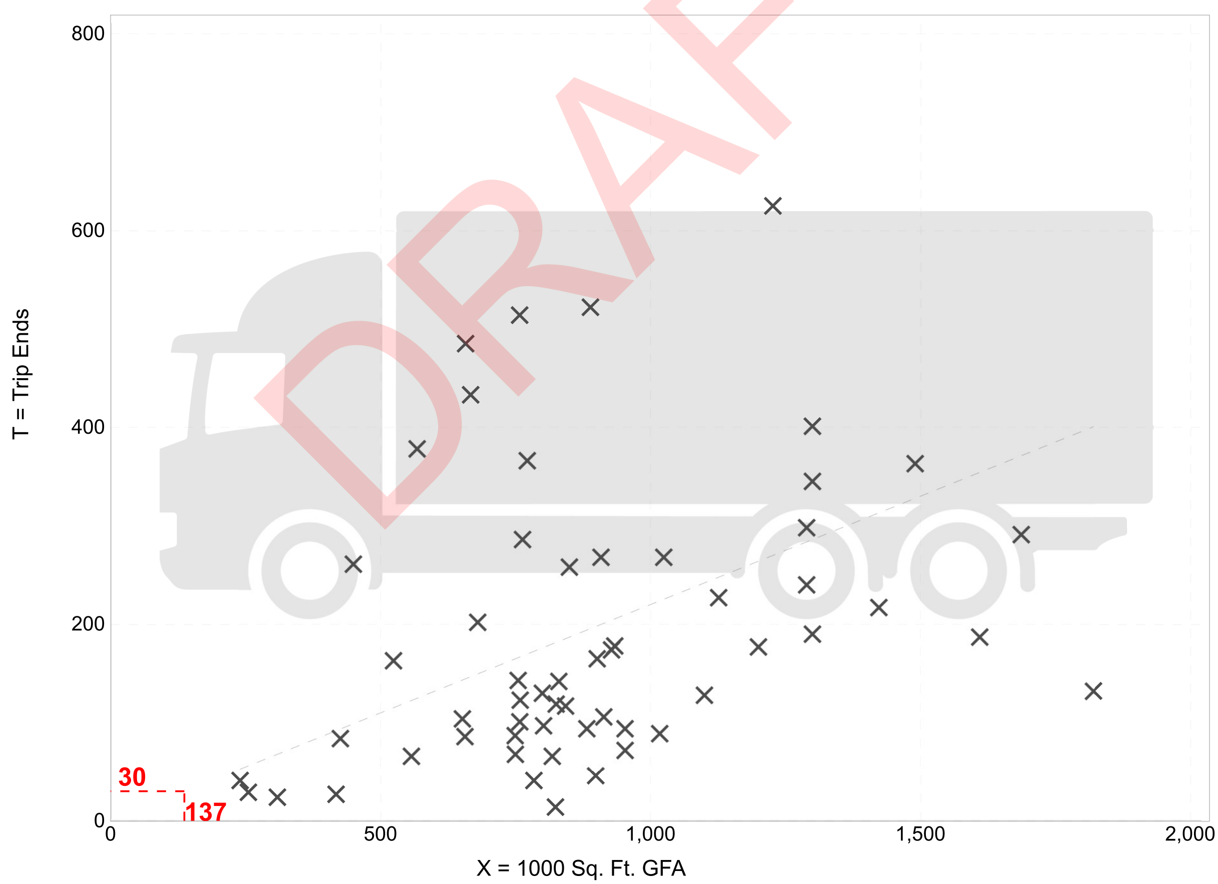
Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 57
Avg. 1000 Sq. Ft. GFA: 892
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.22	0.02 - 0.74	0.16

Data Plot and Equation



× **Study Site** — — — **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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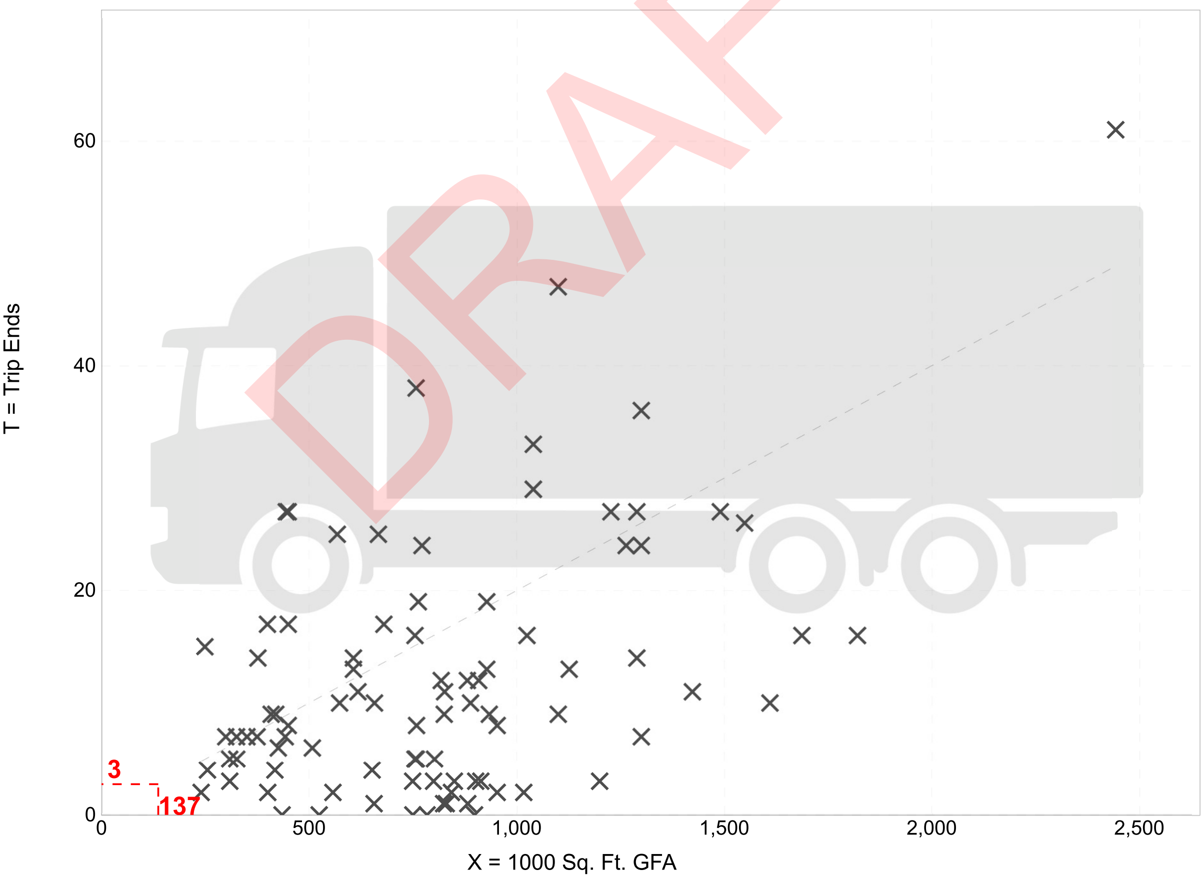
High-Cube Transload and Short-Term Storage Warehouse
(154)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	90
Avg. 1000 Sq. Ft. GFA:	812
Directional Distribution:	49% entering, 51% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.02	0.00 - 0.06	0.01

Data Plot and Equation



Fitted Curve Equation: Not Given R^2= ****

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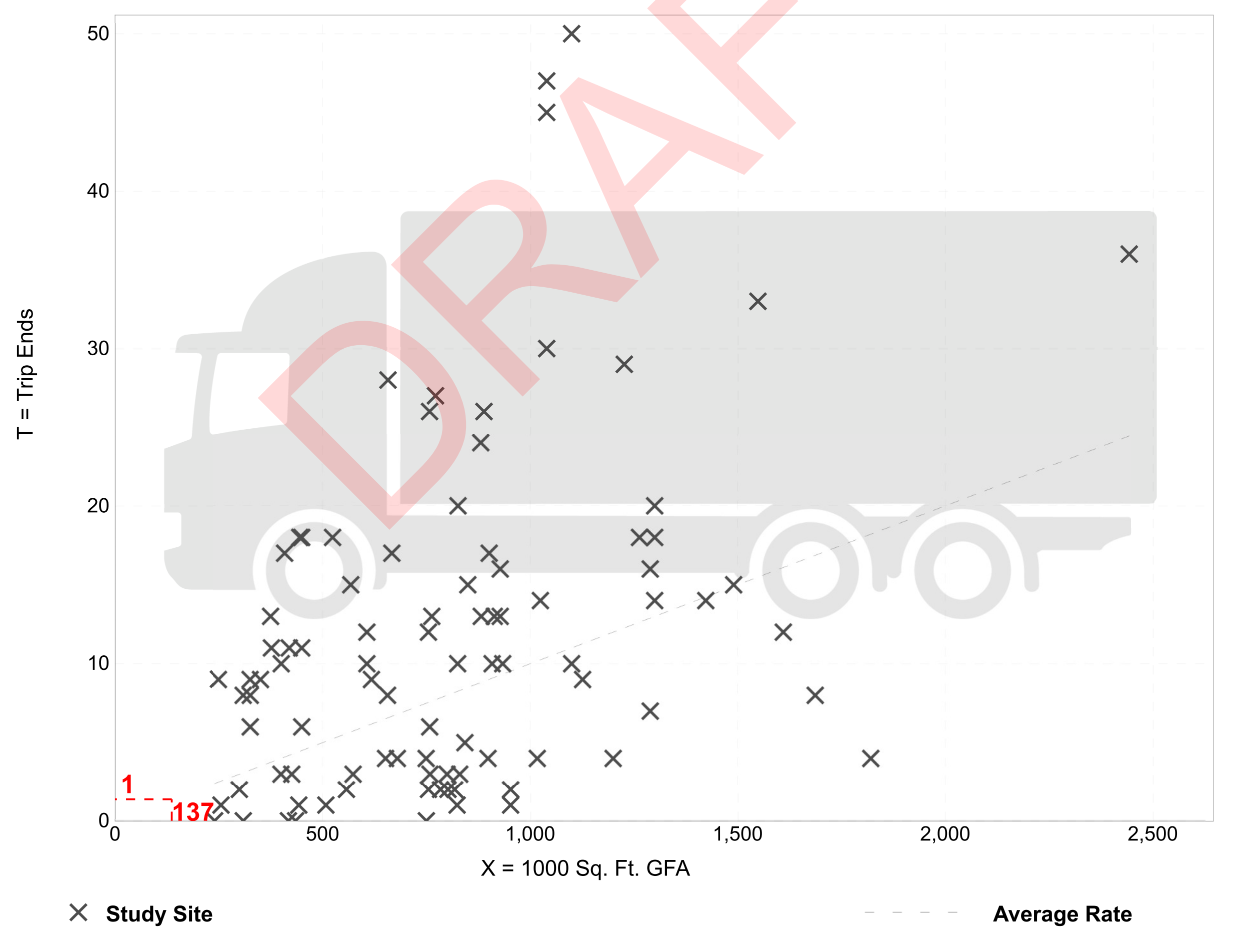
High-Cube Transload and Short-Term Storage Warehouse (154)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	91
Avg. 1000 Sq. Ft. GFA:	807
Directional Distribution:	47% entering, 53% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.01	0.00 - 0.05	0.01

Data Plot and Equation



Fitted Curve Equation: Not Given **R^2= ******

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Land Use: 155
High-Cube Fulfillment Center Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

Warehousing (Land Use 150), high-cube transload and short-term storage warehouse (Land Use 154), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related land uses.

Land Use Subcategory

Each fulfillment center in the ITE database has been categorized as either a sort or non-sort facility. A sort facility is a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. A non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means. Separate sets of data plots are presented for the sort and non-sort fulfillment centers. Some limited assembly and repackaging may occur within the facility.

Additional Data

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled "High-Cube Warehouse Vehicle Trip Generation Analysis," published in October 2016. The results of this study are posted on the ITE website at http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498.

The sites were surveyed in the 2000s and the 2010s in California, New Jersey, and Texas.

Source Numbers

752, 941, 1001, 1002, 1011

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

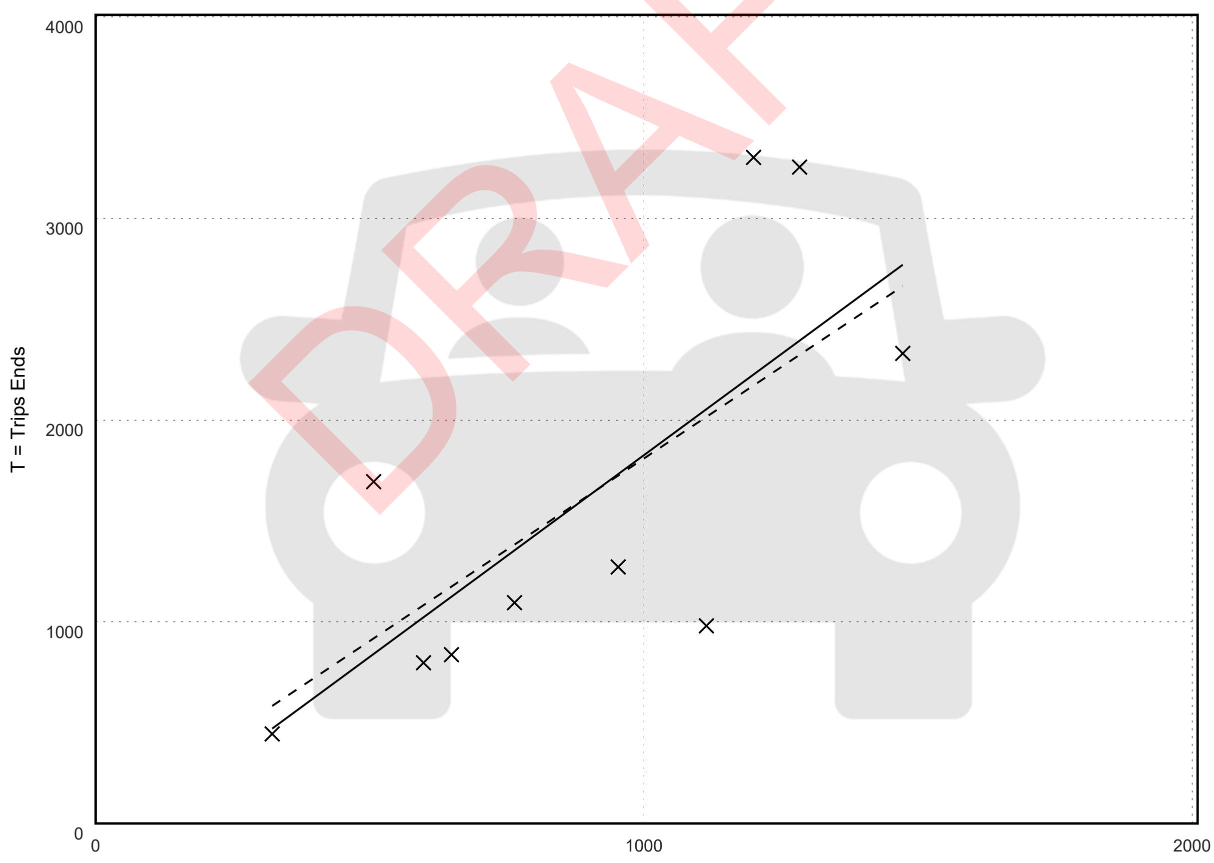
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 886
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.81	0.88 - 3.34	0.76

Data Plot and Equation



× Study Site — Fitted Curve - - - - Average Rate

Fitted Curve Equation: T = 2.00(X) - 173.61 **R^2= 0.54**

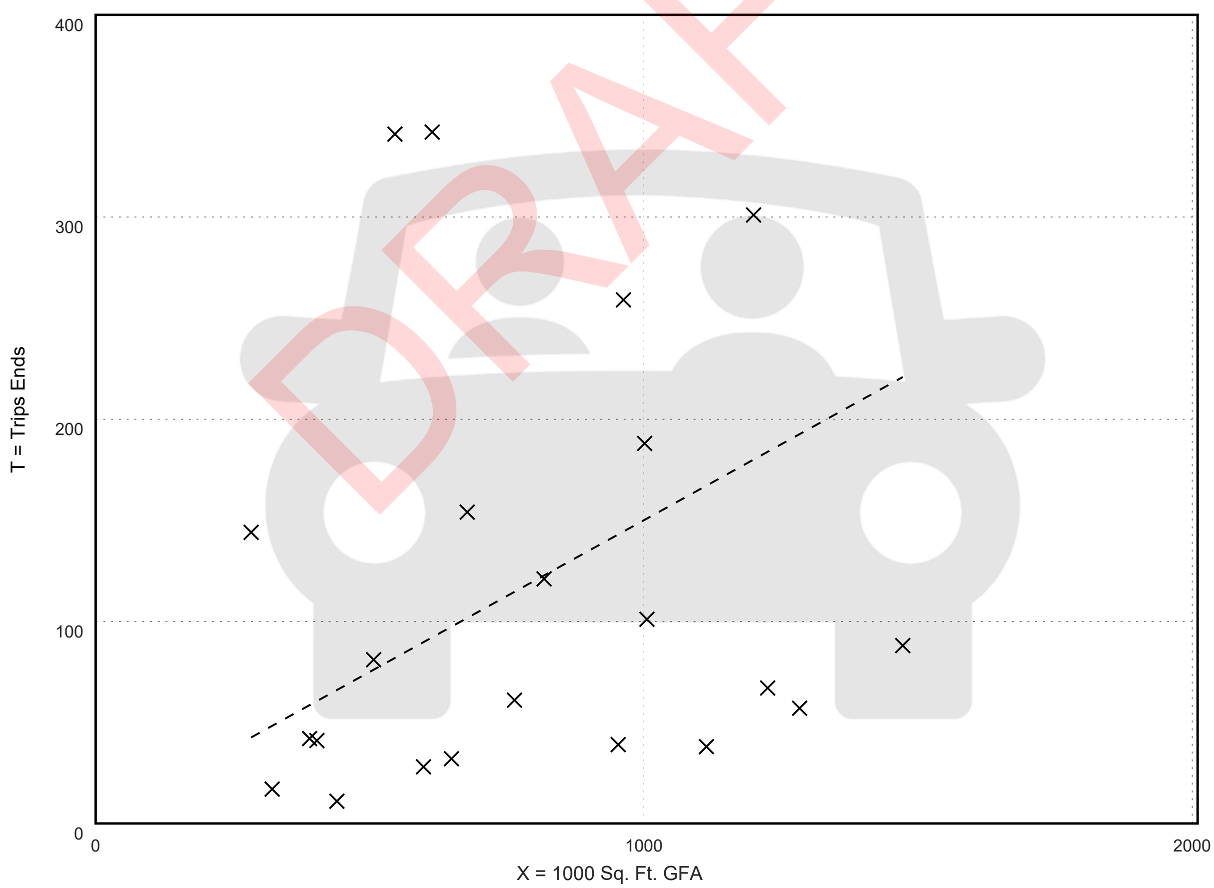
High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	22
Avg. 1000 Sq. Ft. GFA:	783
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.03 - 0.62	0.15

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

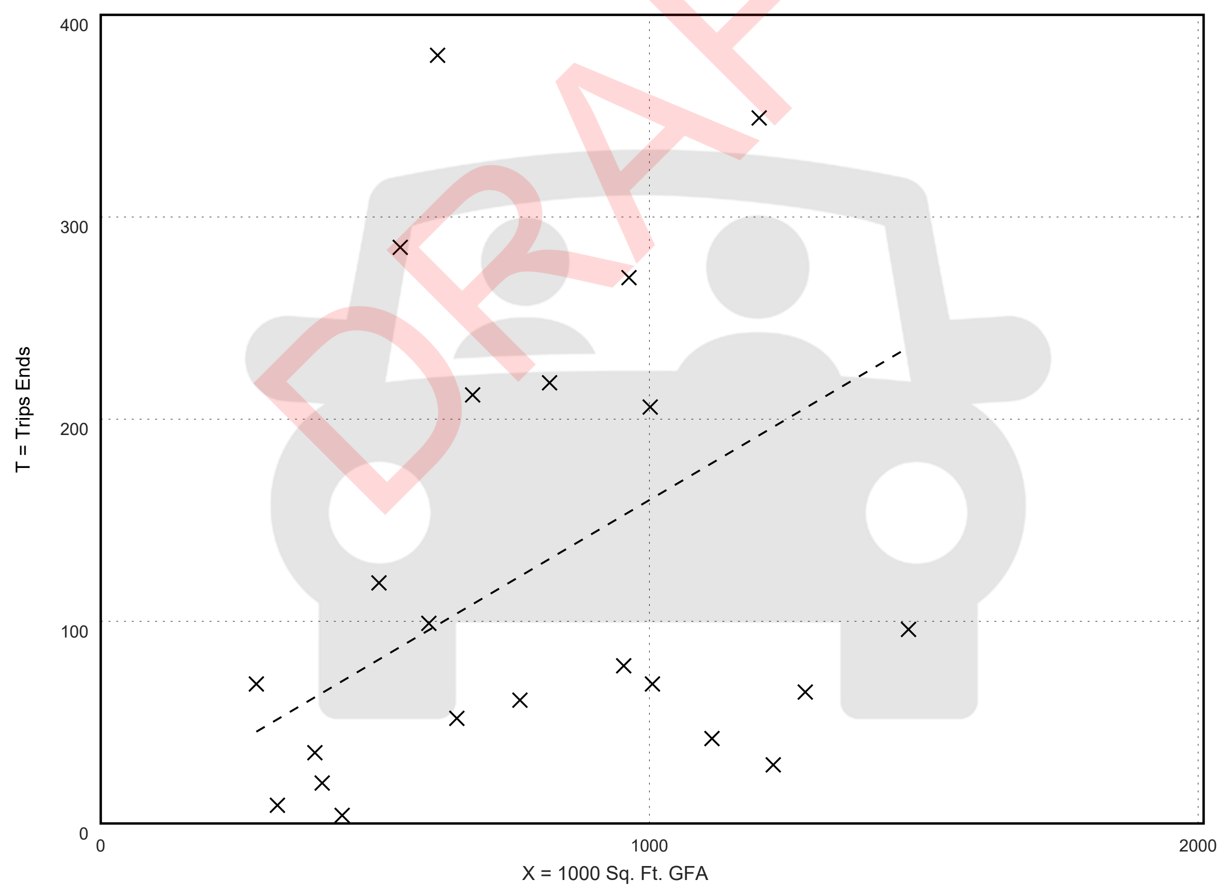
High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	22
Avg. 1000 Sq. Ft. GFA:	783
Directional Distribution:	39% entering, 61% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.16	0.01 - 0.62	0.15

Data Plot and Equation



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= ***

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday, AM Peak Hour of Generator

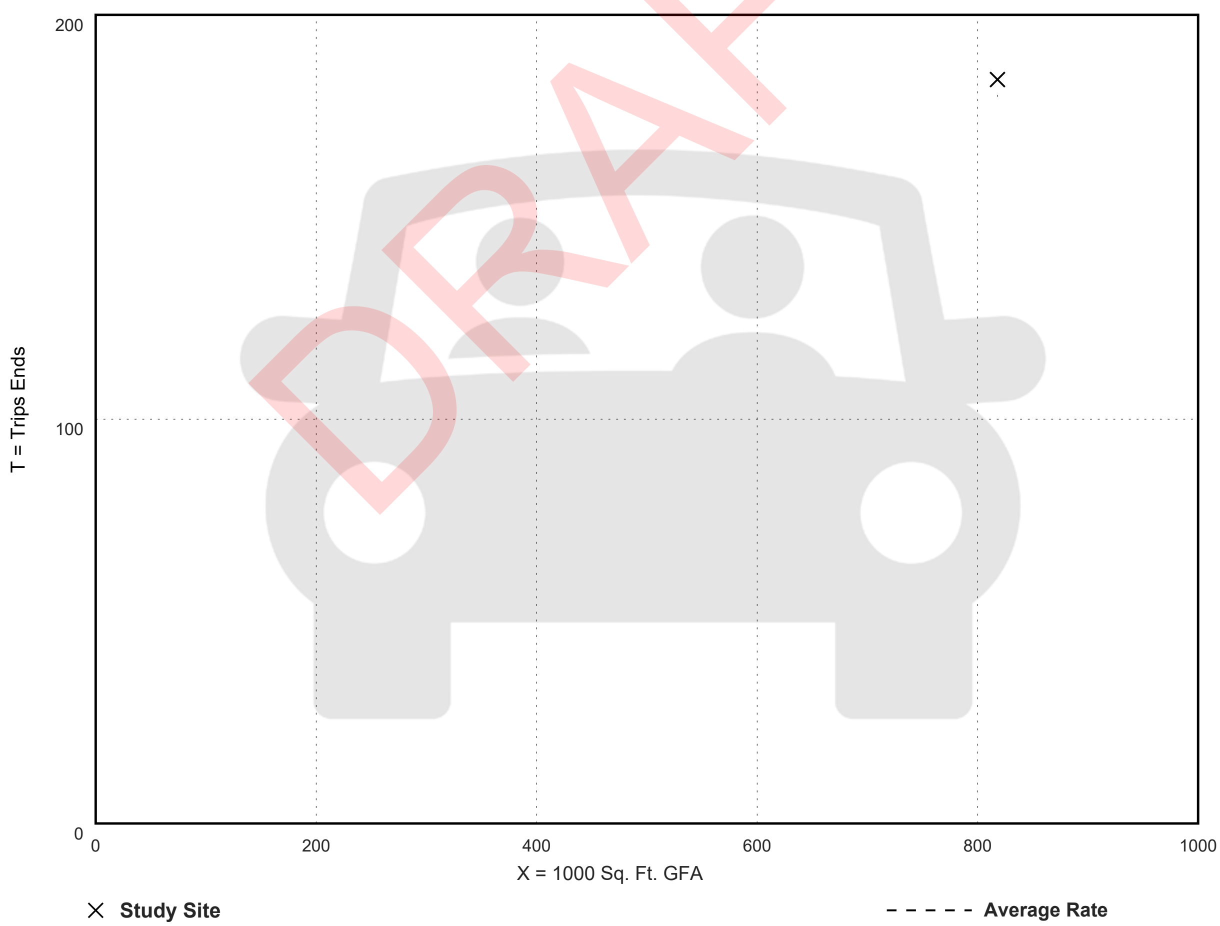
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 818
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.22	0.22 - 0.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

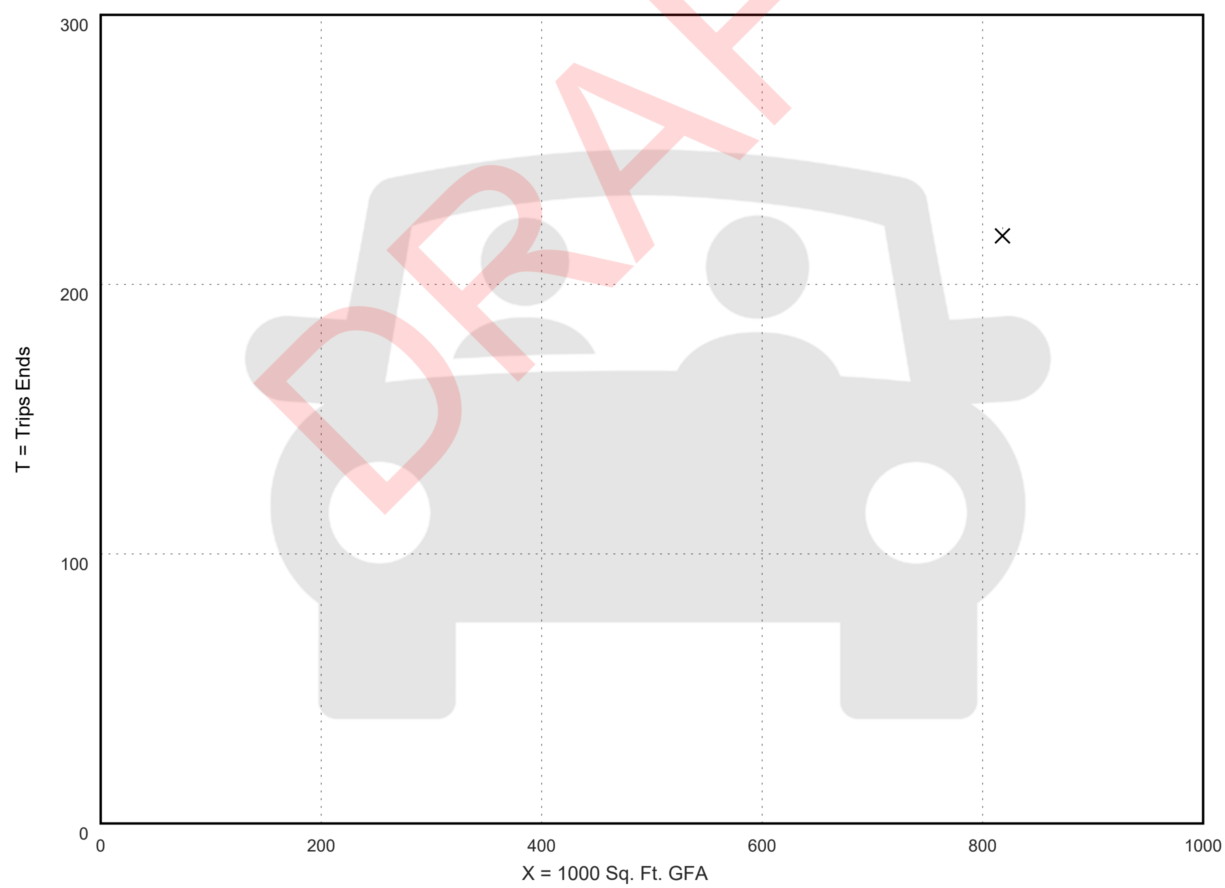
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 818
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.27	0.27 - 0.27	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

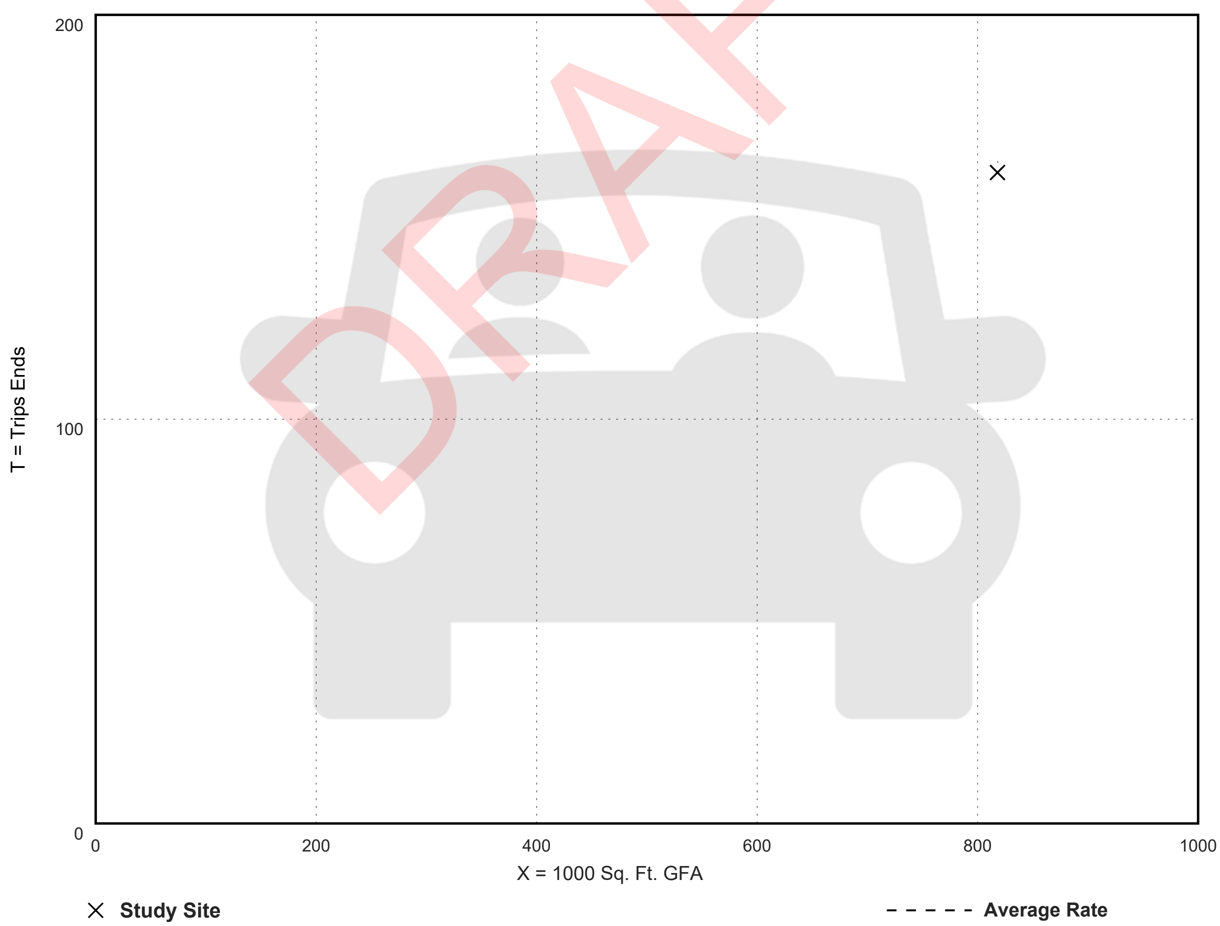
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 818
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.20	0.20 - 0.20	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Sunday, Peak Hour of Generator

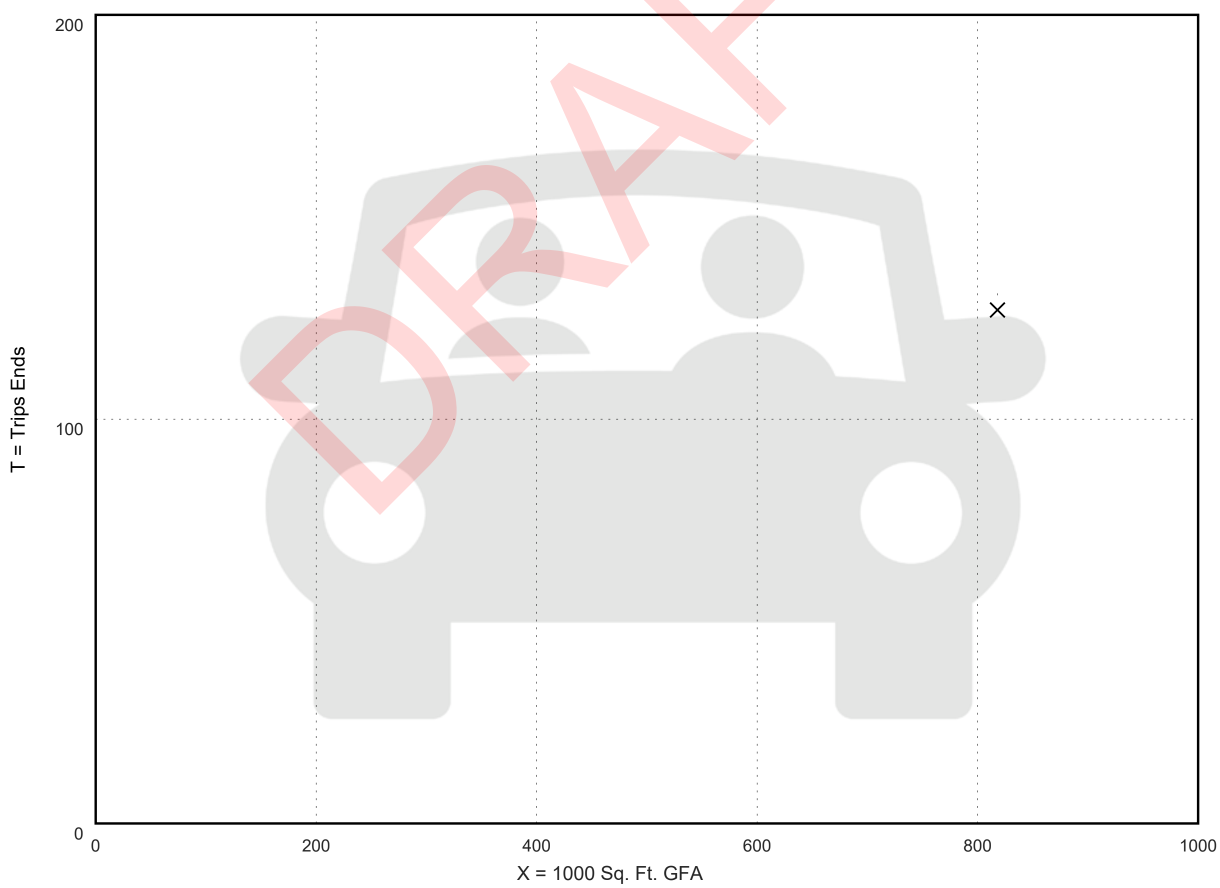
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 818
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.16	0.16 - 0.16	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Fulfillment Center Warehouse - Non-Sort (155)

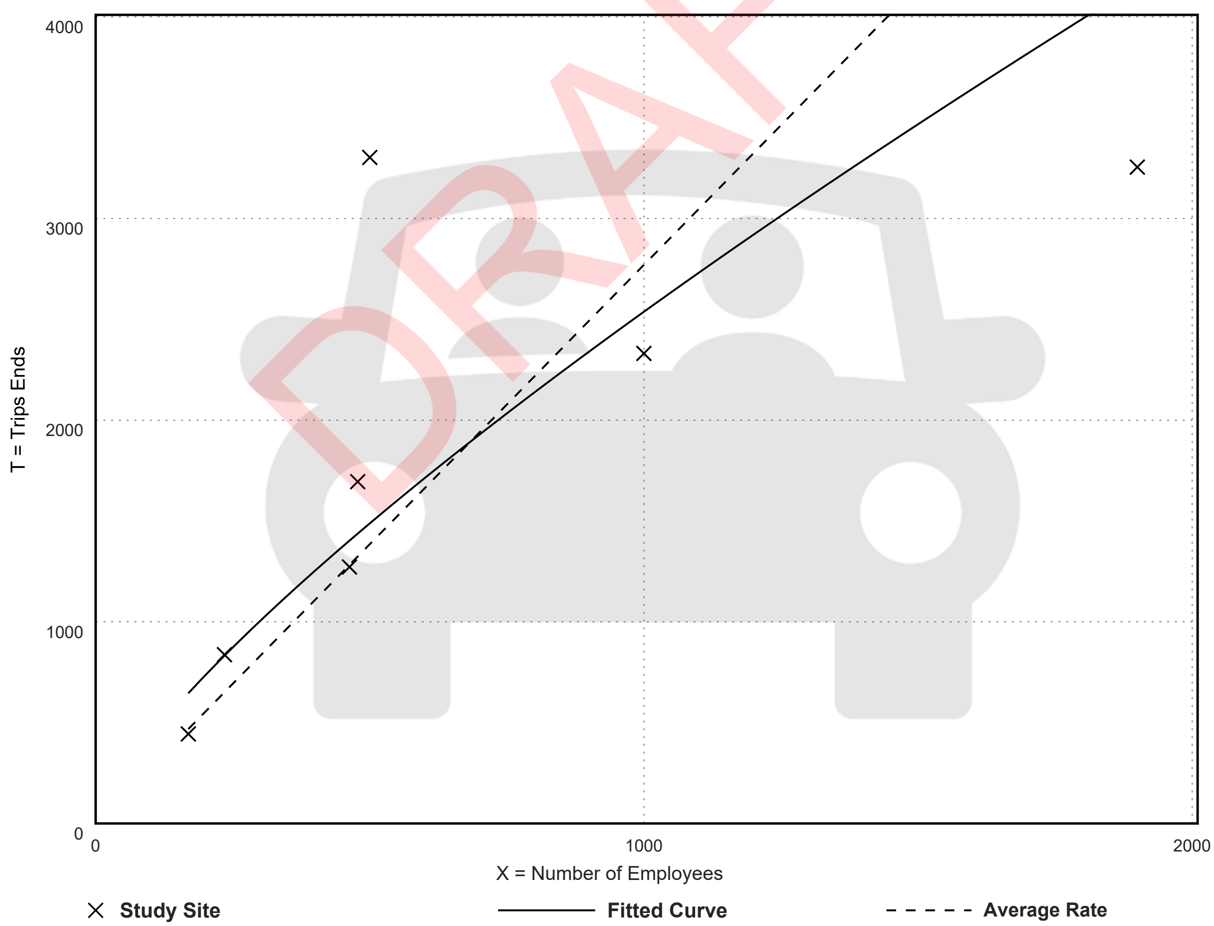
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Employees: 678
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
2.77	1.71 - 6.61	1.58

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.77 Ln(X) + 2.52 **R^2= 0.73**

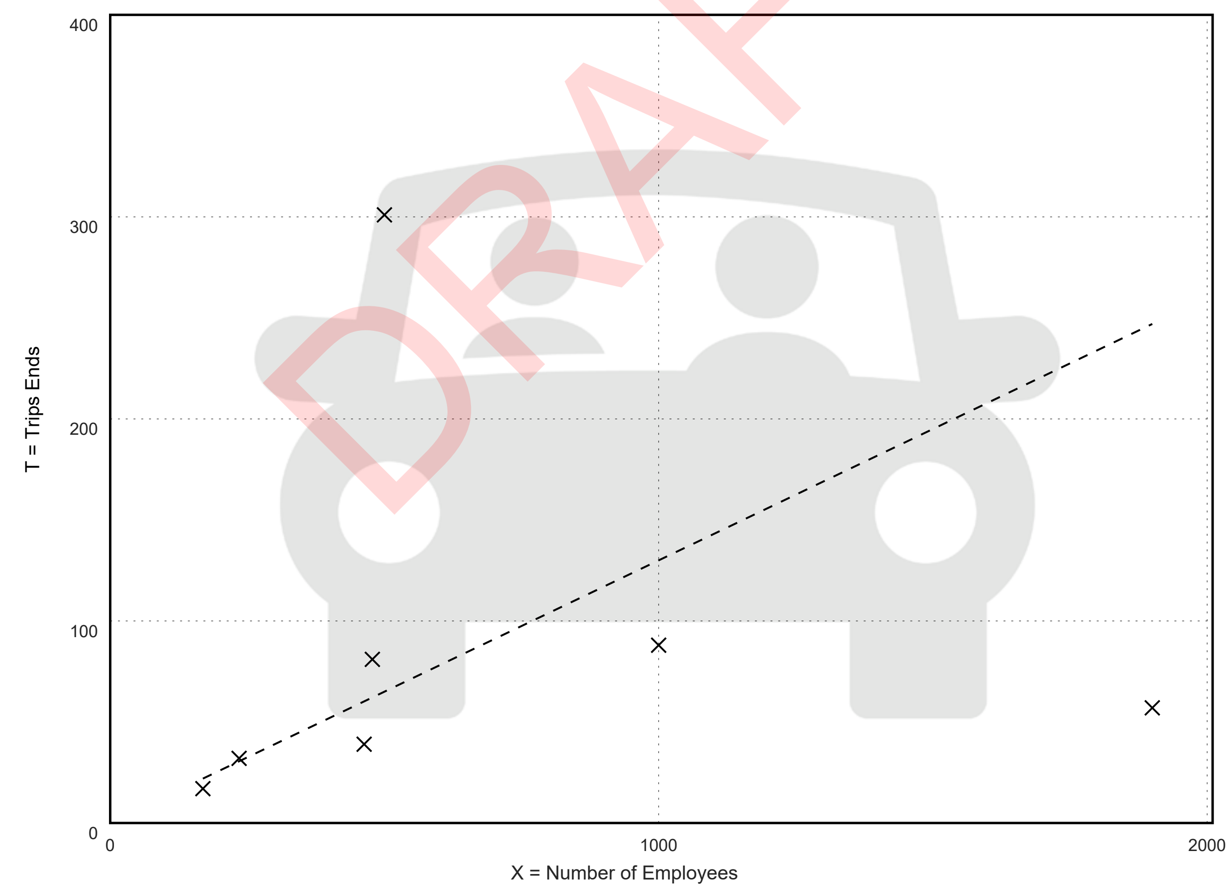
High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Employees: 678
Directional Distribution: 81% entering, 19% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.13	0.03 - 0.60	0.18

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

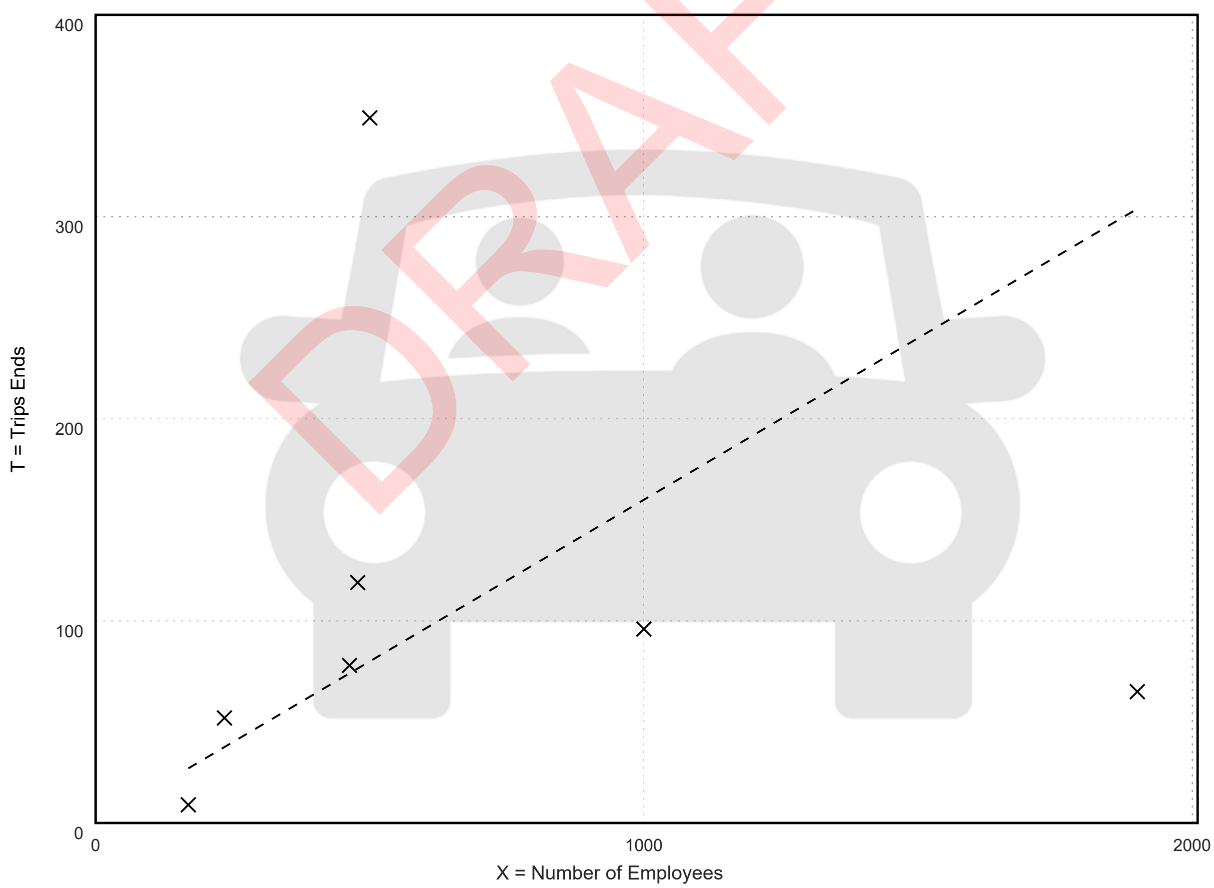
High-Cube Fulfillment Center Warehouse - Non-Sort (155)

Vehicle Trip Ends vs: Employees
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Employees: 678
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.16	0.03 - 0.70	0.21

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

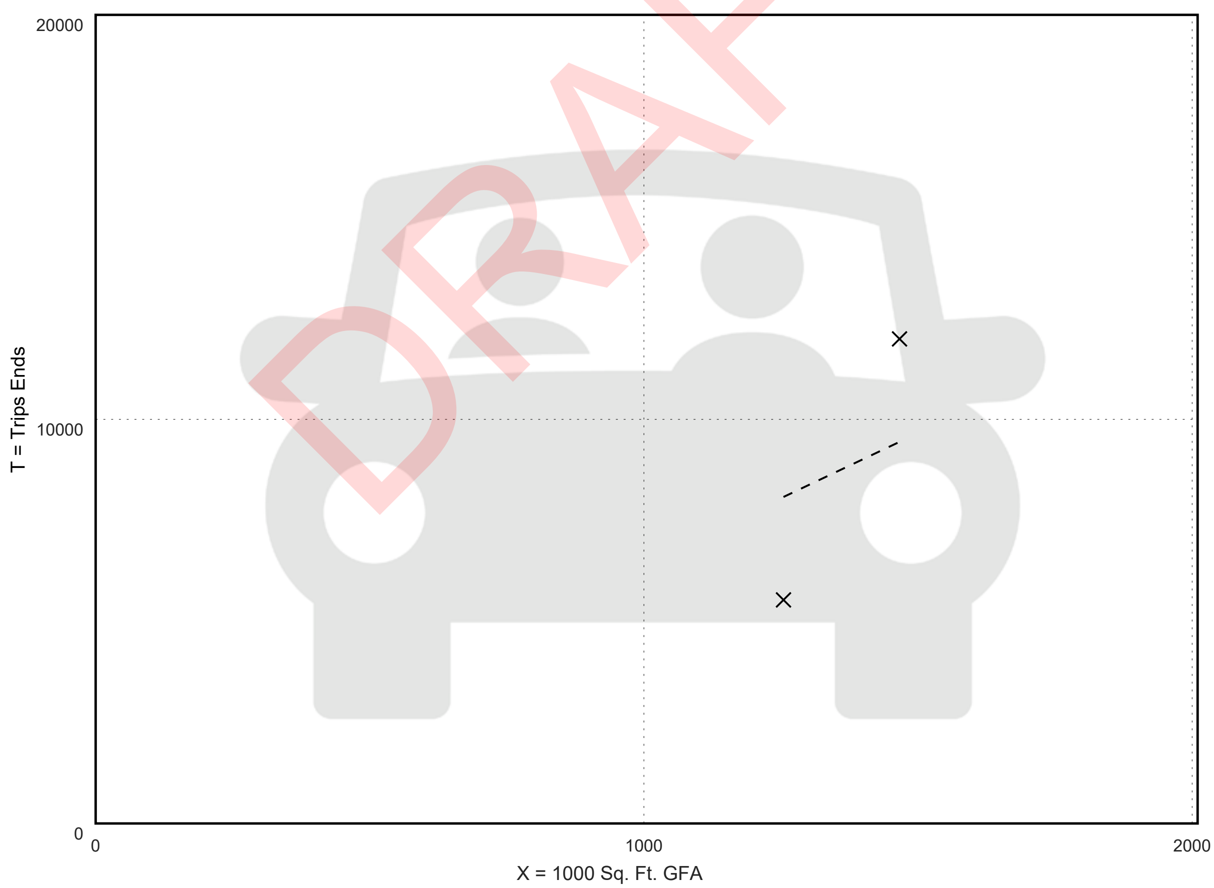
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 1360
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
6.44	4.41 - 8.18	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

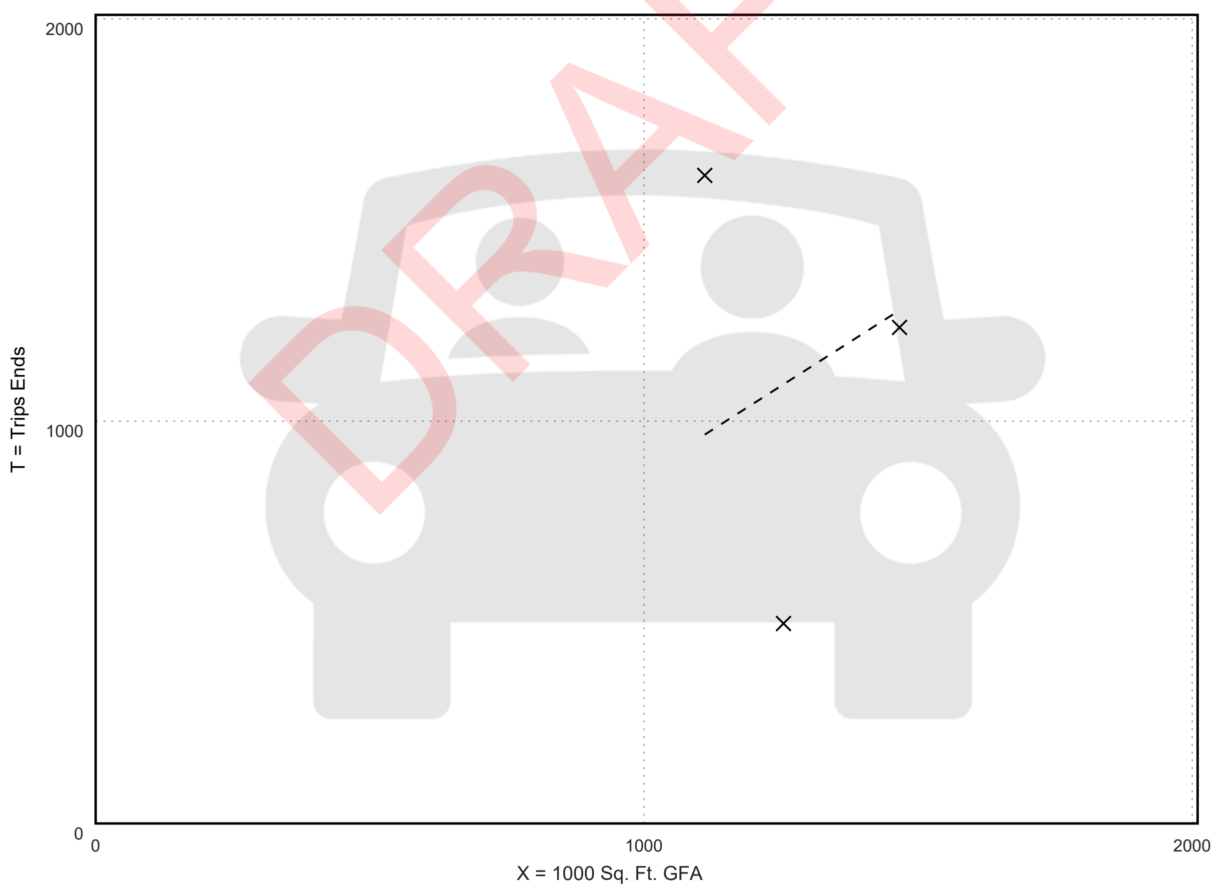
High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	3
Avg. 1000 Sq. Ft. GFA:	1277
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.87	0.40 - 1.45	0.51

Data Plot and Equation



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

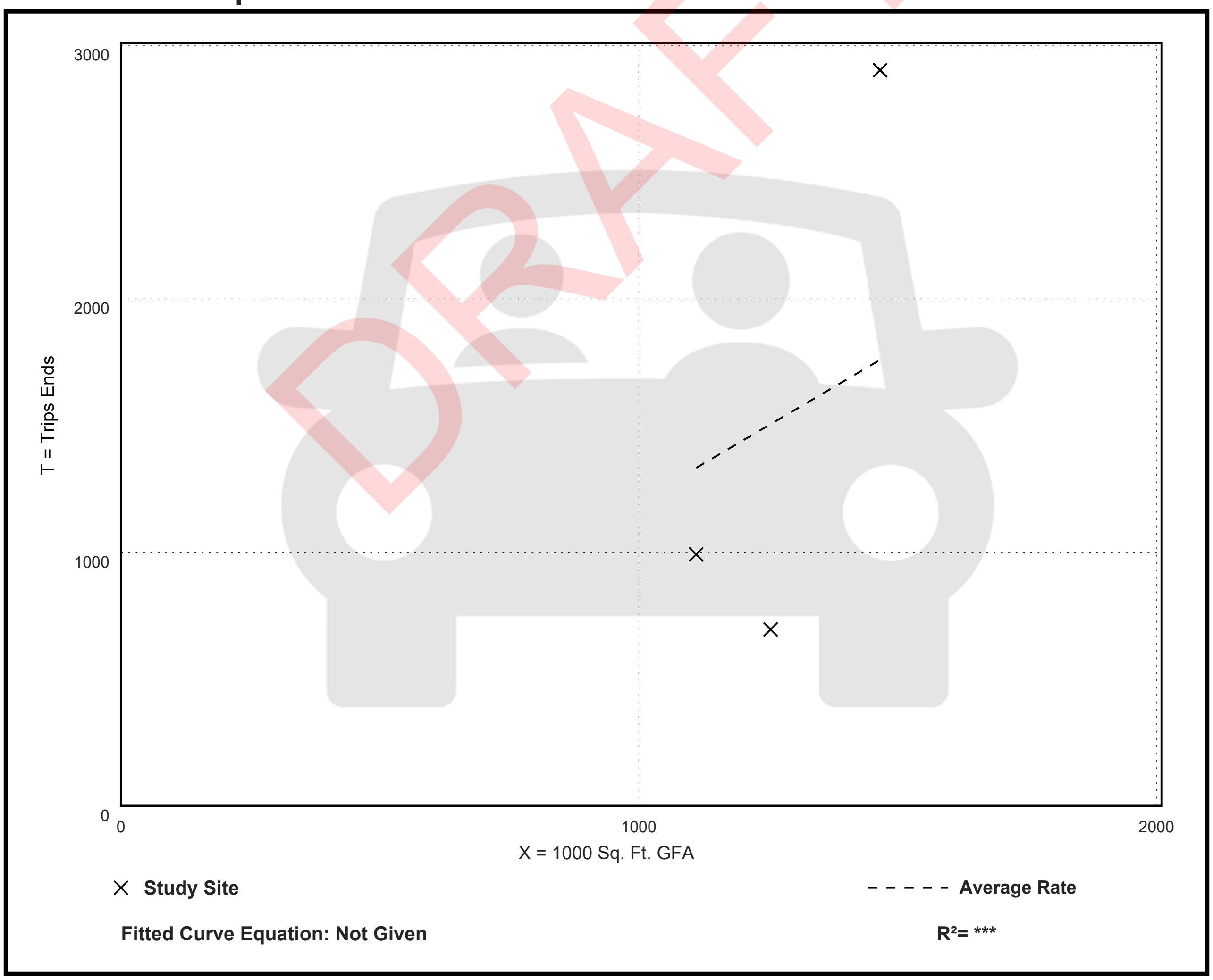
High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	3
Avg. 1000 Sq. Ft. GFA:	1277
Directional Distribution:	39% entering, 61% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.20	0.55 - 1.98	0.77

Data Plot and Equation



High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs: Employees
On a: Weekday

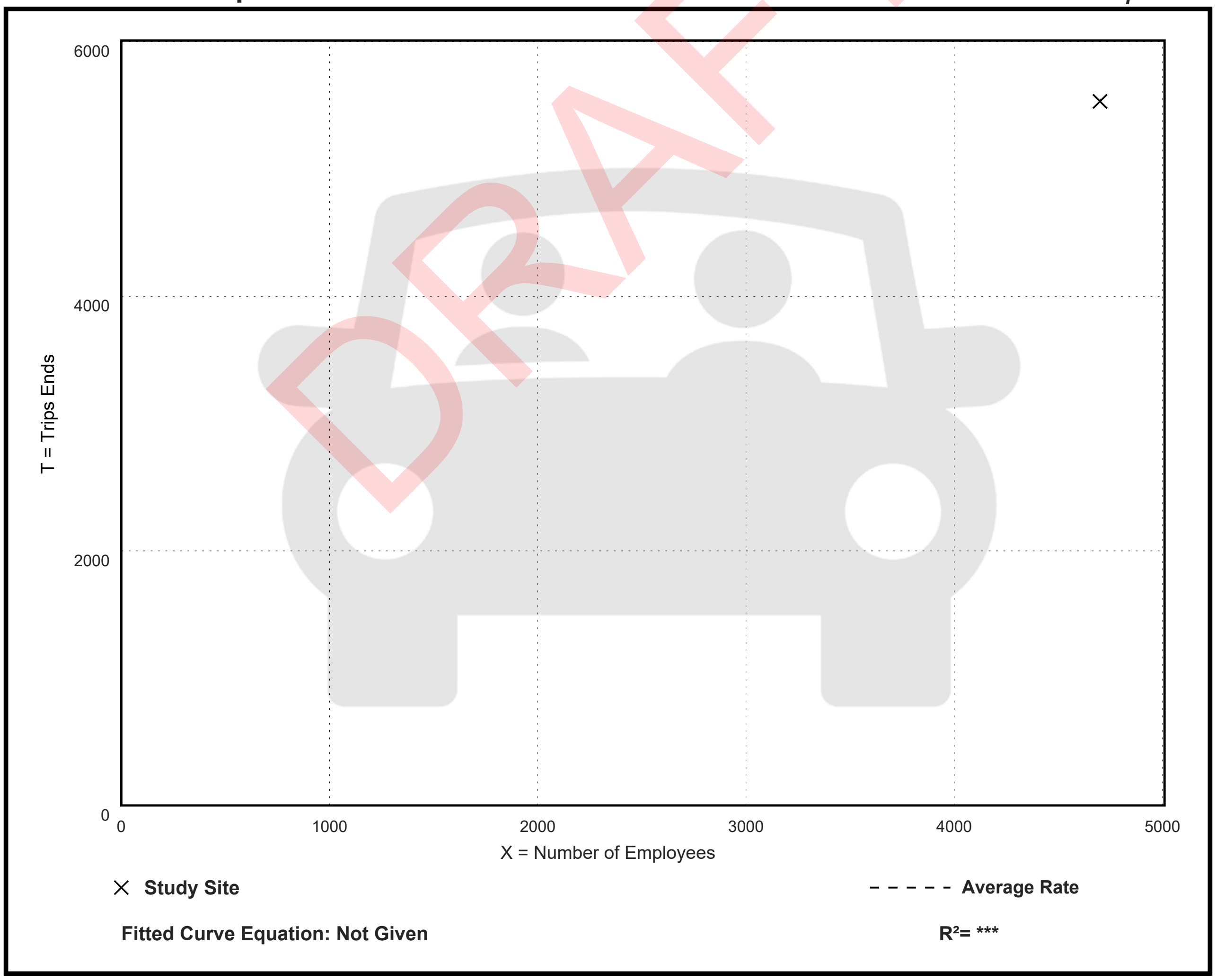
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 4700
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.18	1.18 - 1.18	***

Data Plot and Equation

Caution – Small Sample Size



High-Cube Fulfillment Center Warehouse - Sort (155)

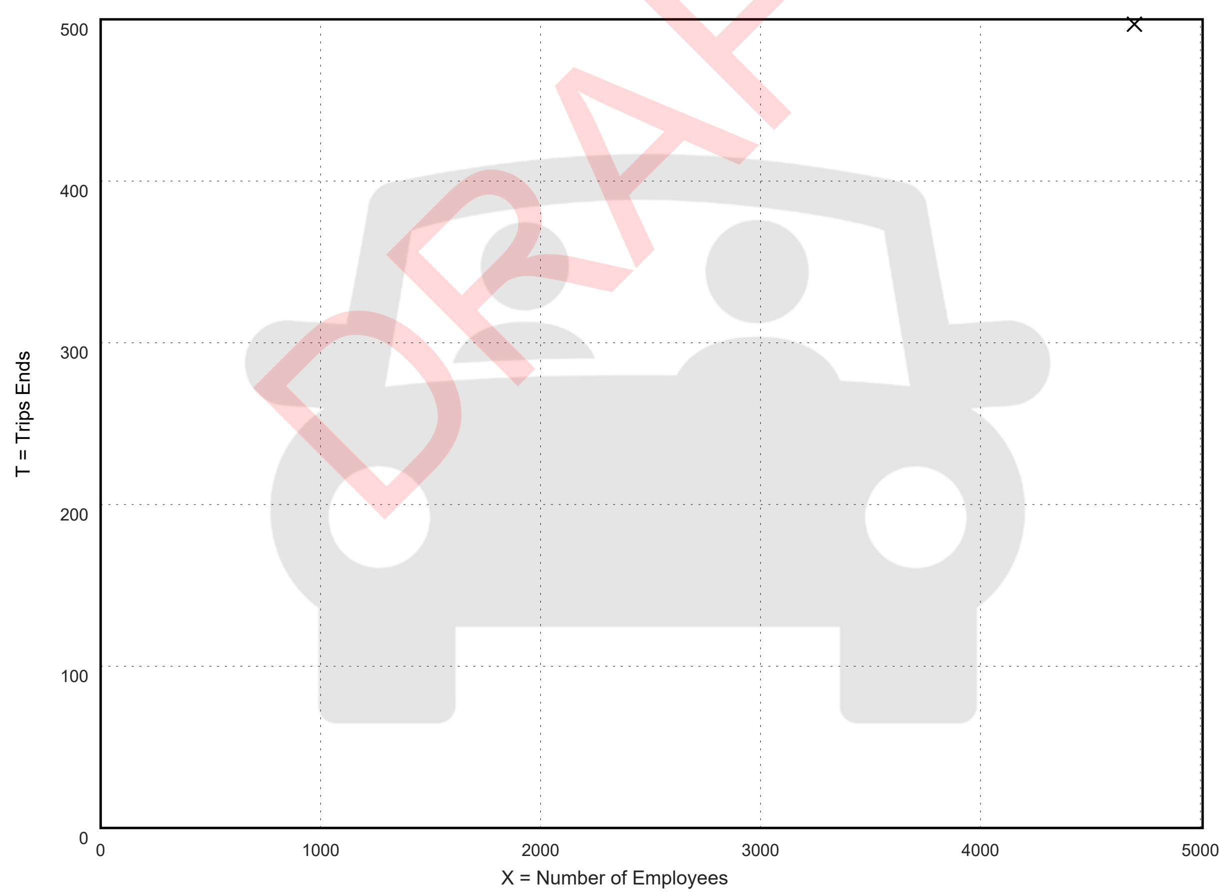
Vehicle Trip Ends vs:	**Employees**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	1
Avg. Num. of Employees:	4700
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.11	0.11 - 0.11	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Fulfillment Center Warehouse - Sort (155)

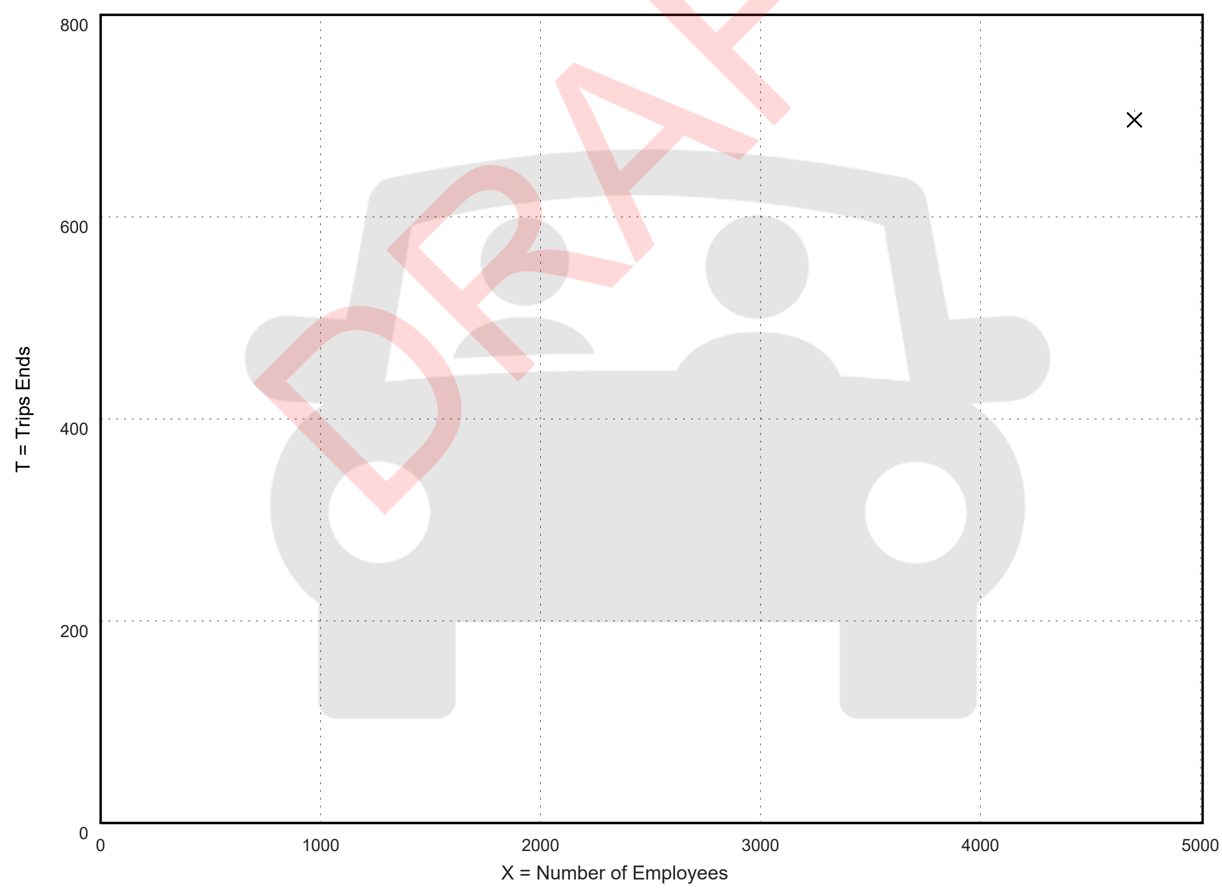
Vehicle Trip Ends vs:	**Employees**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	1
Avg. Num. of Employees:	4700
Directional Distribution:	39% entering, 61% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.15	0.15 - 0.15	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= ***

High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

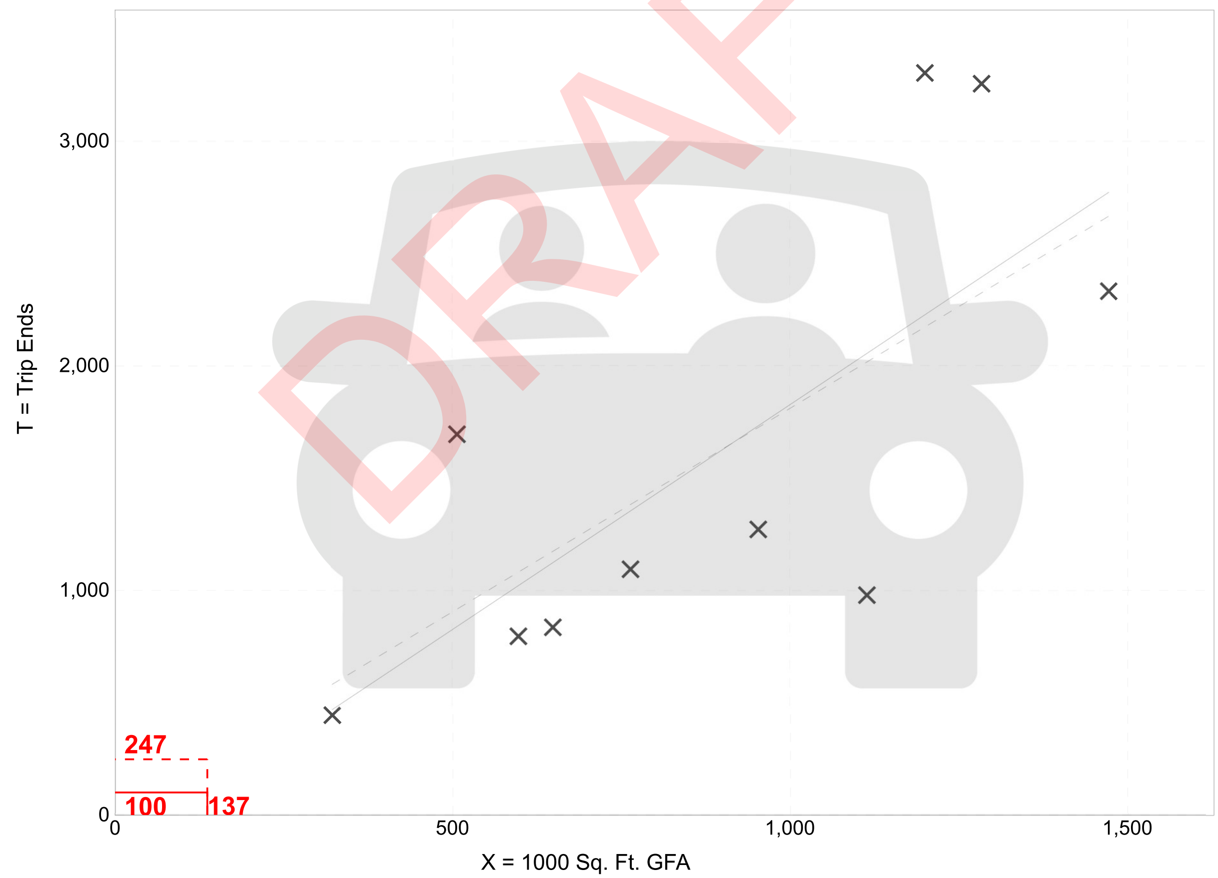
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 886
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.81	0.88 - 3.34	0.76

Data Plot and Equation



Fitted Curve Equation: T = 2.00(X) - 173.61 **R^2= 0.54**

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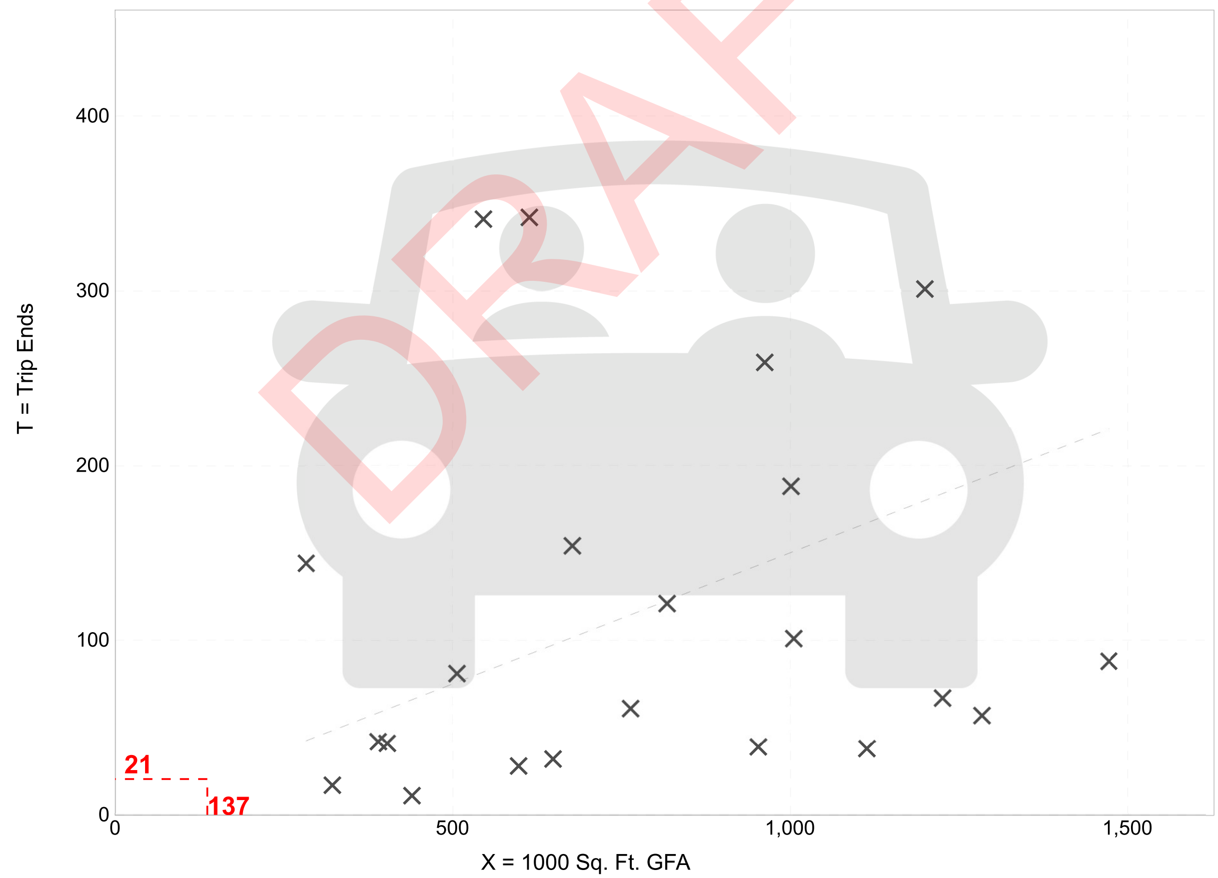
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	22
Avg. 1000 Sq. Ft. GFA:	783
Directional Distribution:	81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.03 - 0.62	0.15

Data Plot and Equation



× **Study Site** — — — **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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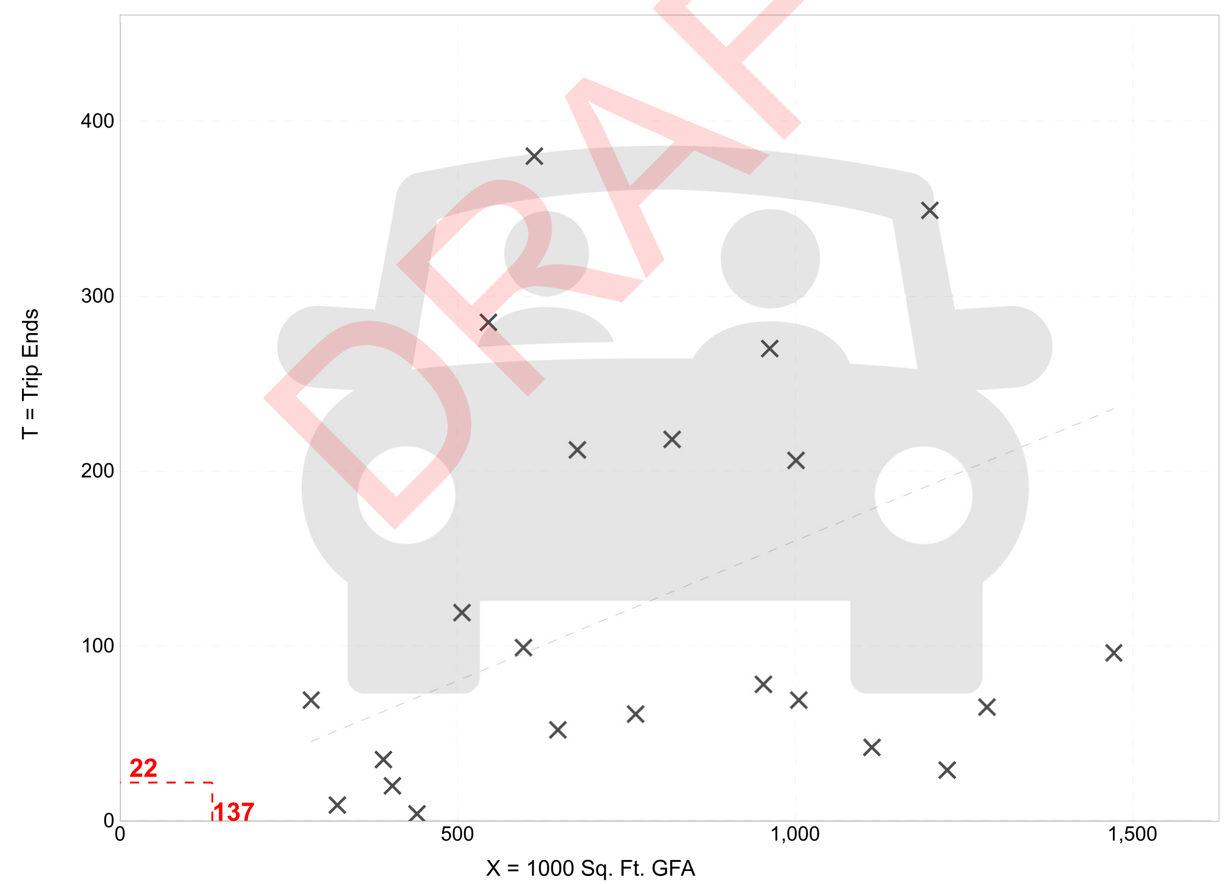
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	22
Avg. 1000 Sq. Ft. GFA:	783
Directional Distribution:	39% entering, 61% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.16	0.01 - 0.62	0.15

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

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High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

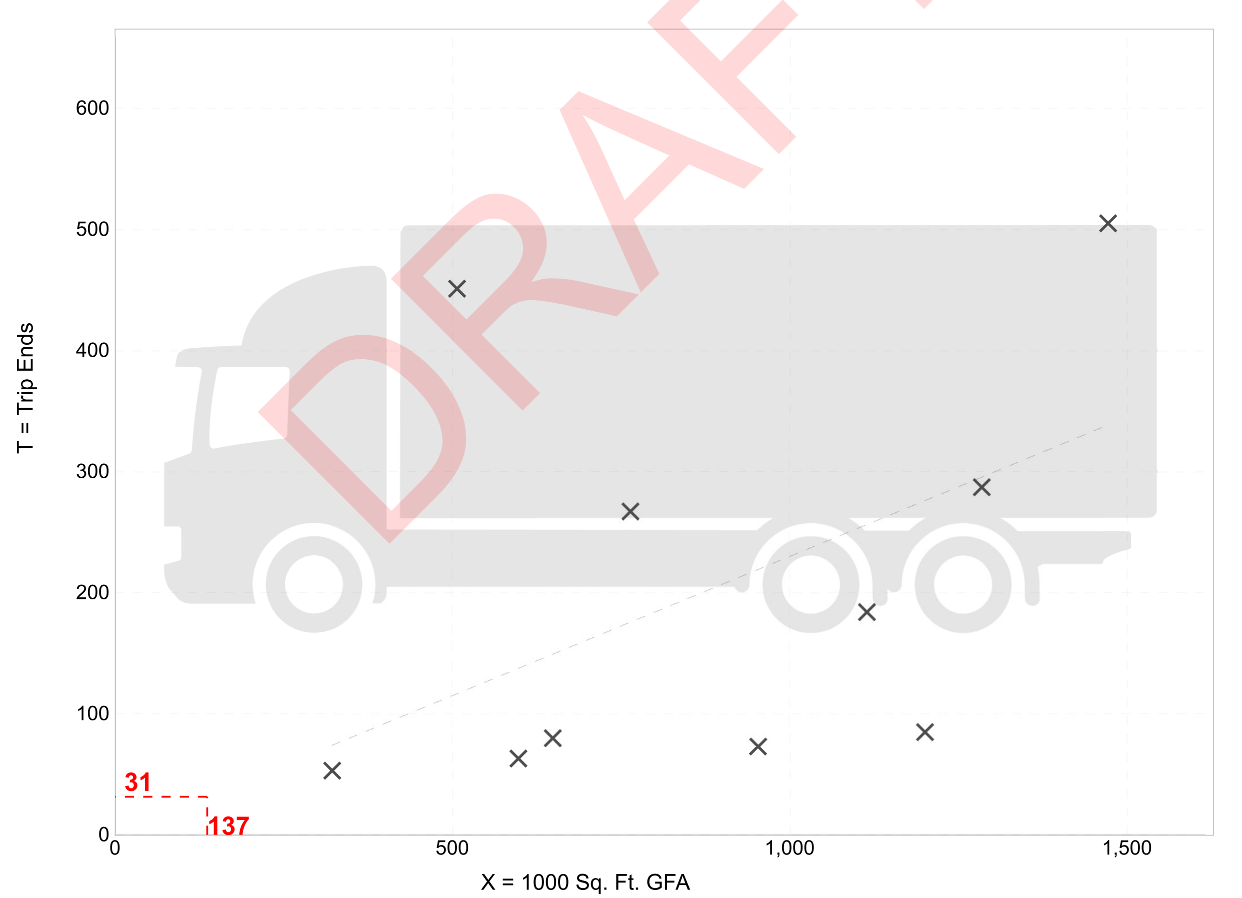
Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 886
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.23	0.07 - 0.89	0.20

Data Plot and Equation



× **Study Site** **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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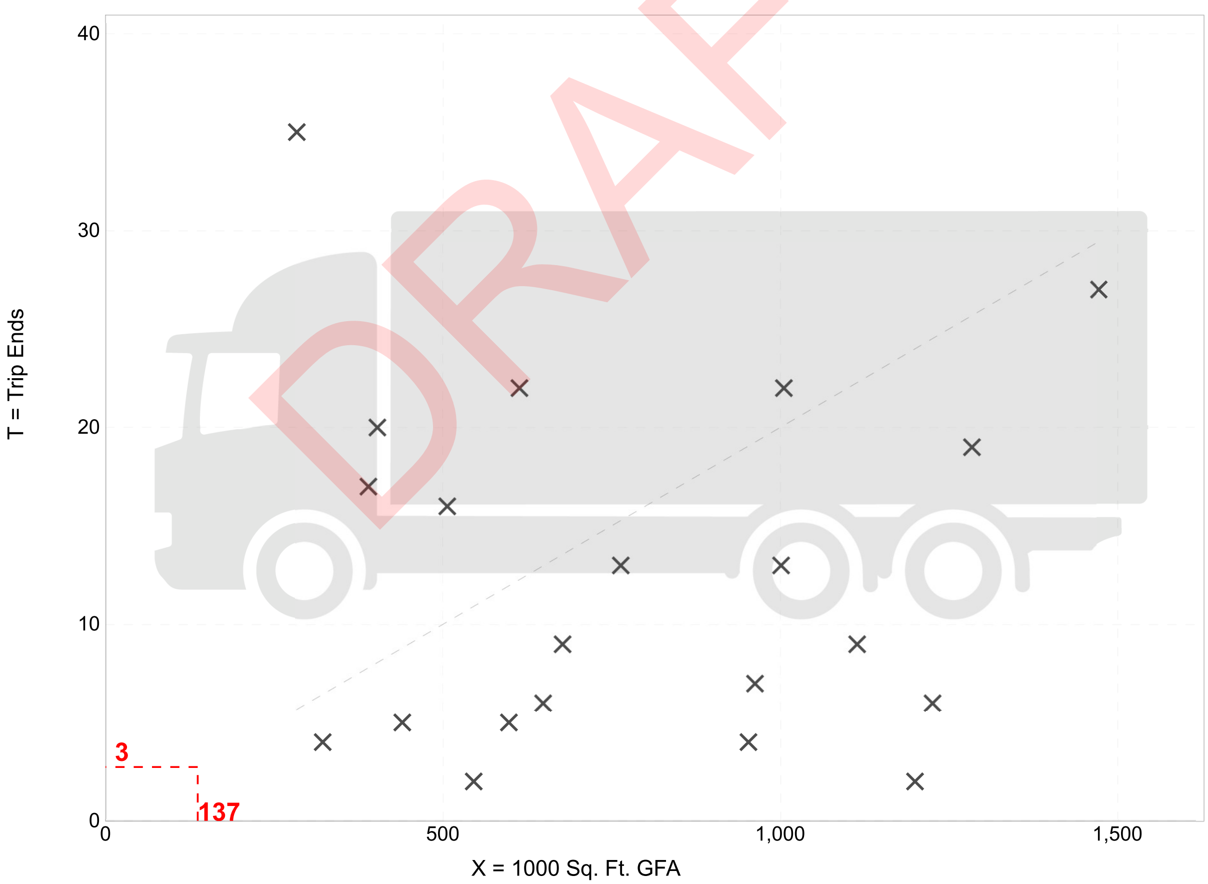
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	21
Avg. 1000 Sq. Ft. GFA:	782
Directional Distribution:	50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.02	0.00 - 0.12	0.02

Data Plot and Equation



Study Site — Average Rate

Fitted Curve Equation: Not Given **R^2= ******

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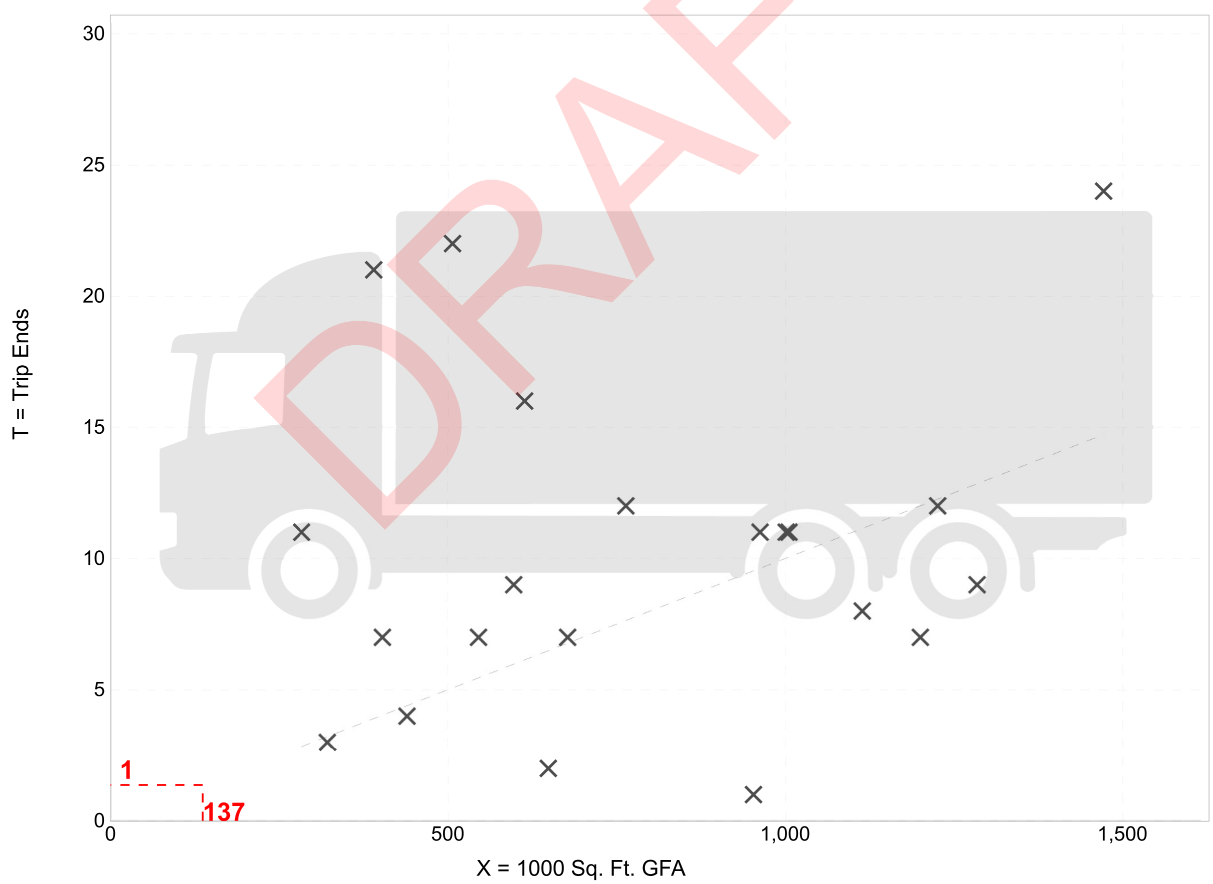
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	21
Avg. 1000 Sq. Ft. GFA:	782
Directional Distribution:	46% entering, 54% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.01	0.00 - 0.05	0.01

Data Plot and Equation



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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Land Use: 156
High-Cube Parcel Hub Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

A high-cube parcel hub warehouses typically serves as a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers. A site can also include truck maintenance, wash, or fueling facilities. Some limited assembly and repackaging may occur within the facility.

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

Warehousing (Land Use 150), high-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), and high-cube cold storage warehouse (Land Use 157) are related land uses.

Additional Data

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled “High-Cube Warehouse Vehicle Trip Generation Analysis,” published in October 2016. The results of this study are posted on the ITE website at http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 2010s in California, Connecticut, and Minnesota.

Source Numbers

869, 892, 941, 1001, 1011

High-Cube Parcel Hub Warehouse (156)

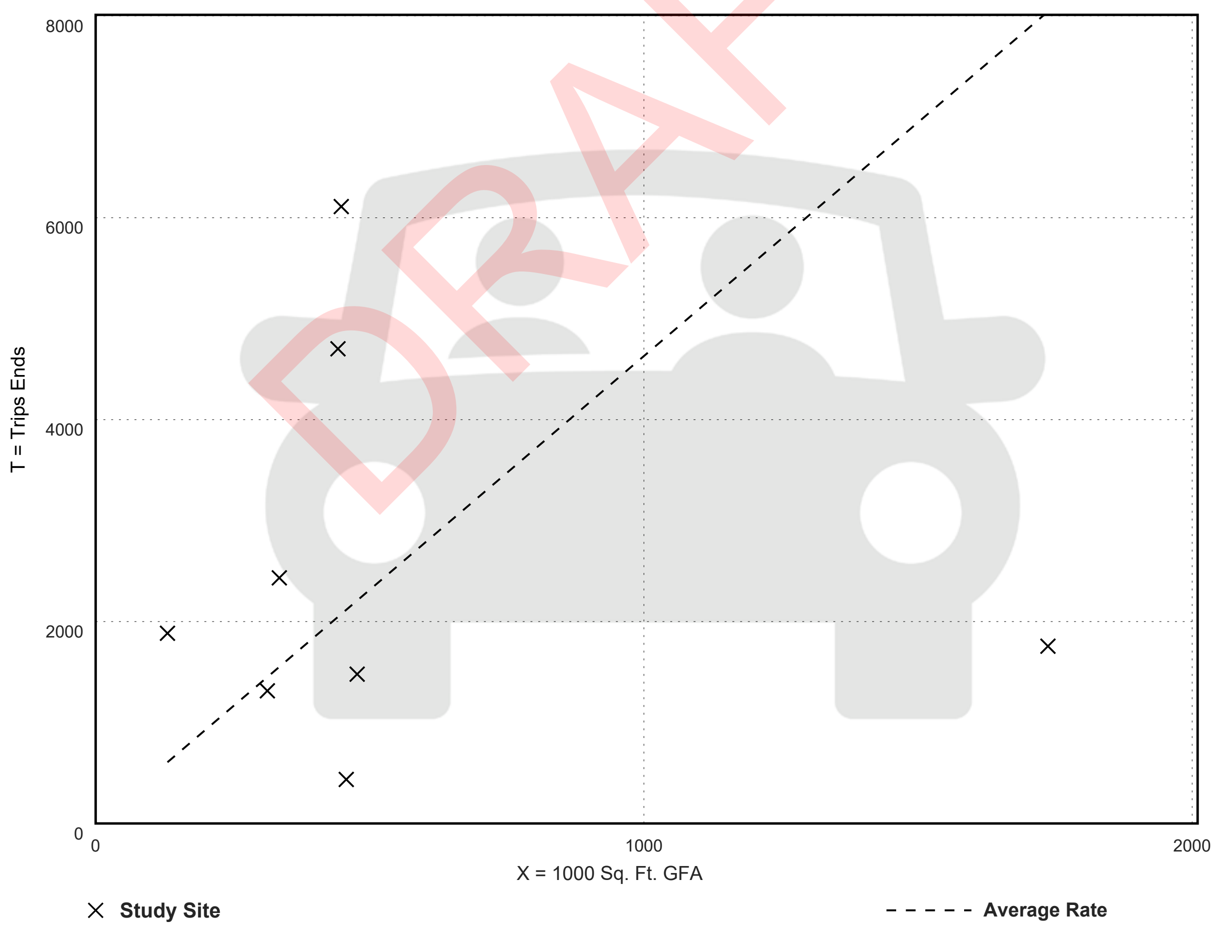
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 8
Avg. 1000 Sq. Ft. GFA: 543
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.63	0.95 - 14.38	5.06

Data Plot and Equation



Fitted Curve Equation: Not Given **R² = ***

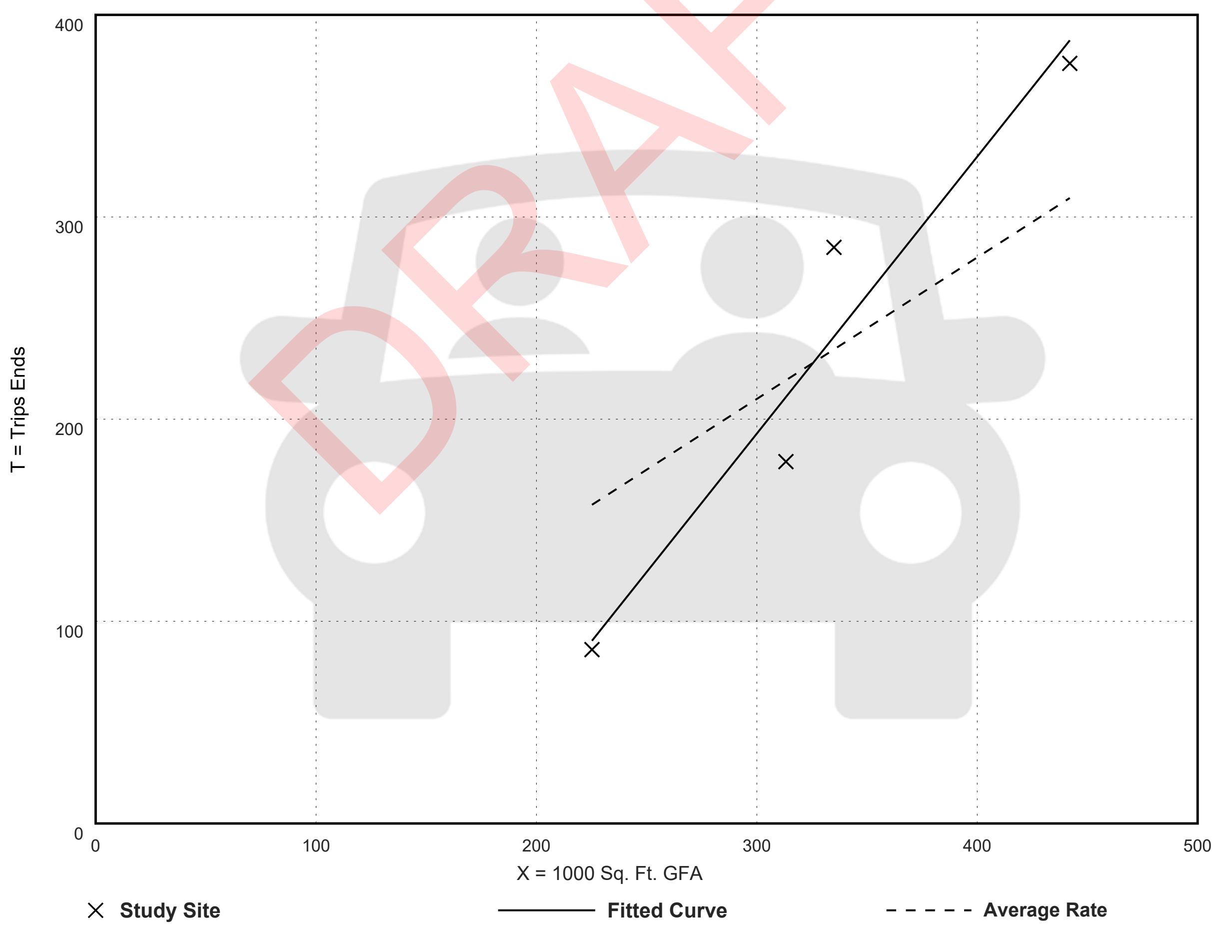
High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	4
Avg. 1000 Sq. Ft. GFA:	329
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.70	0.38 - 0.85	0.21

Data Plot and Equation



Fitted Curve Equation: $T = 1.37(X) - 218.14$ **$R^2 = 0.93$**

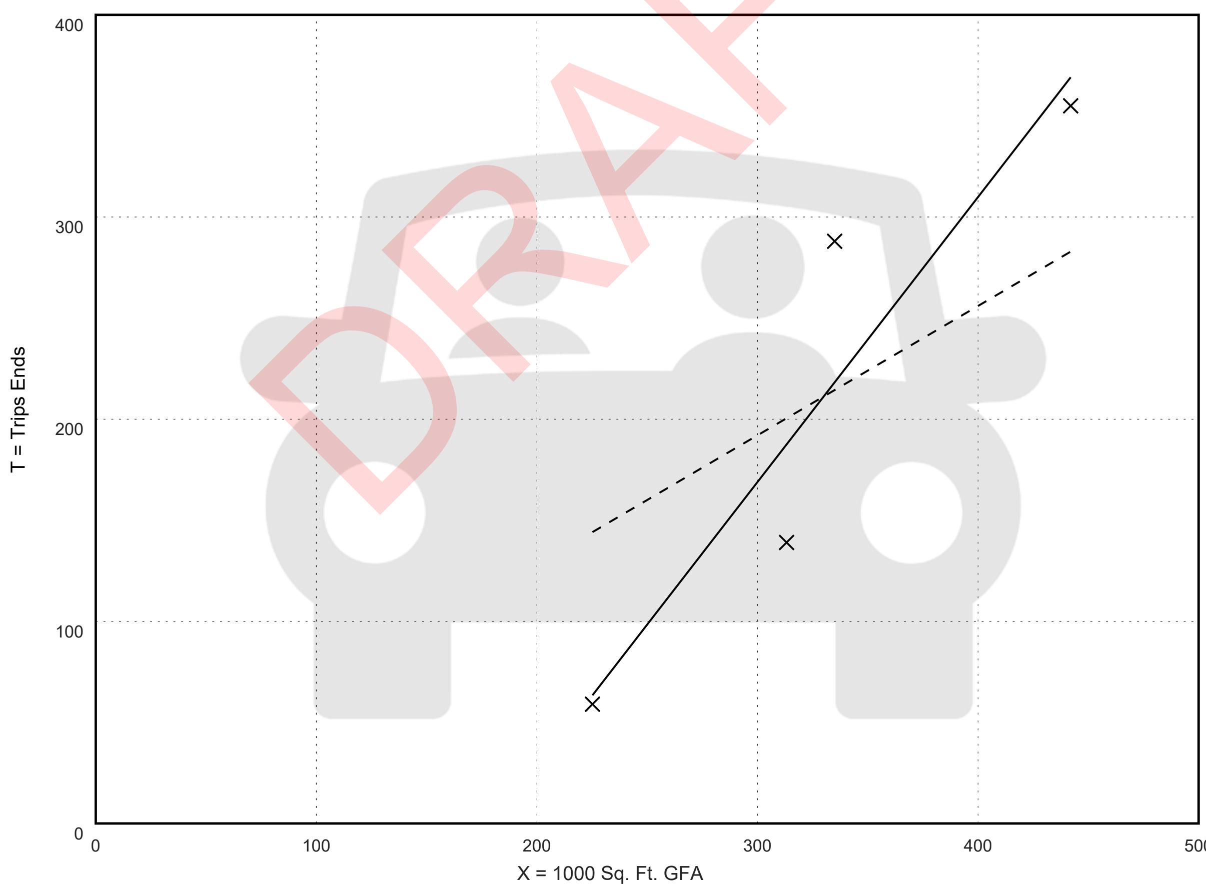
High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 329
Directional Distribution: 68% entering, 32% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.64	0.26 - 0.86	0.27

Data Plot and Equation



× Study Site —— Fitted Curve - - - - - Average Rate

Fitted Curve Equation: T = 1.41(X) - 254.12 **R^2= 0.86**

High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

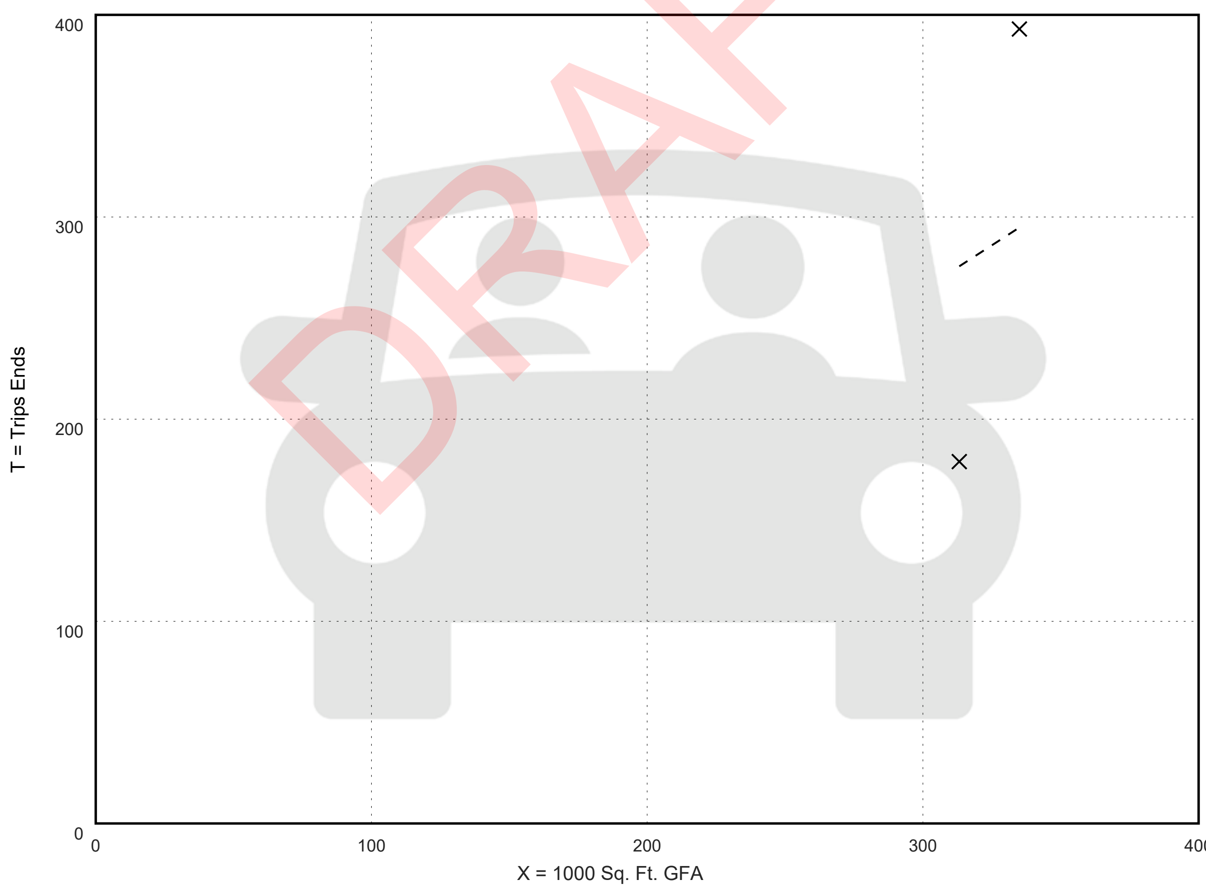
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 324
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.88	0.57 - 1.17	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= *****

High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

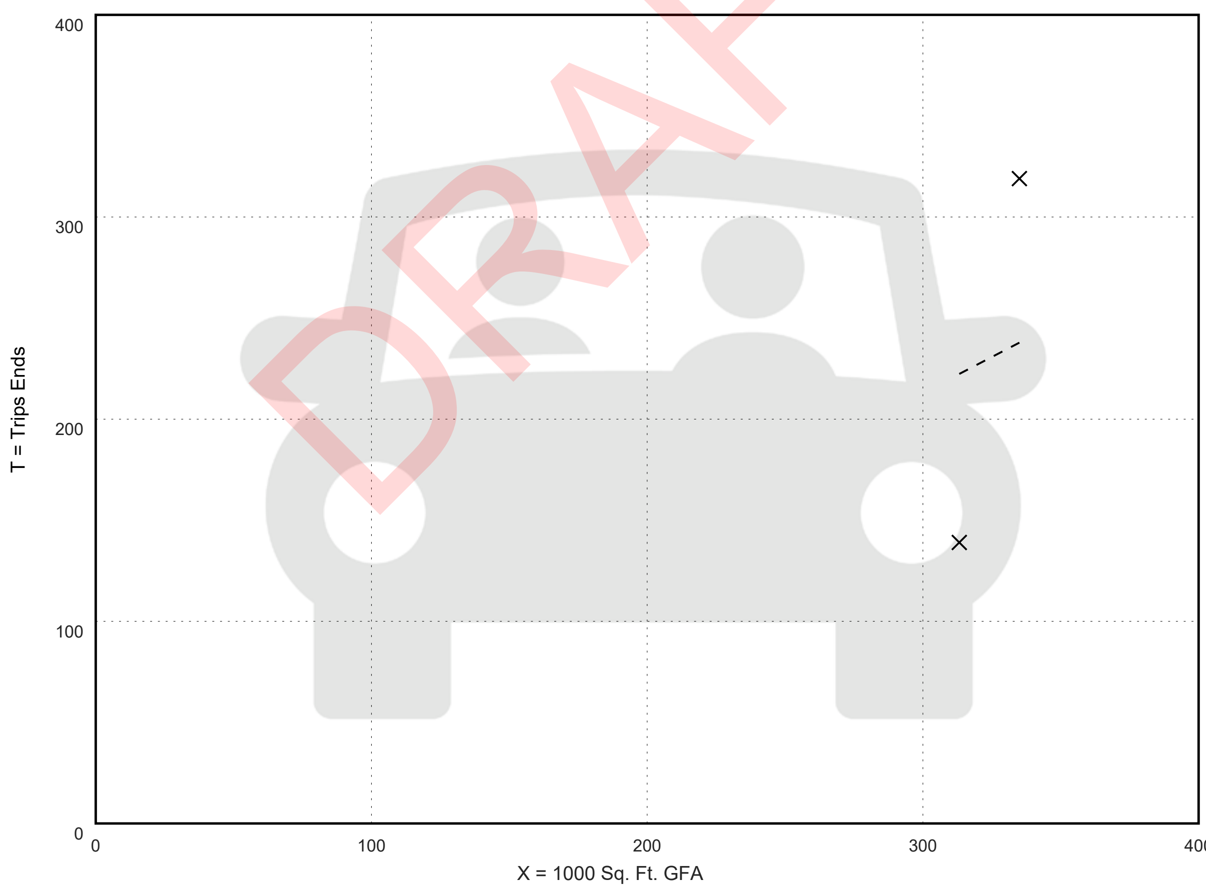
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 324
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.71	0.44 - 0.95	***

Data Plot and Equation

Caution – Small Sample Size



× **Study Site**

- - - - - **Average Rate**

Fitted Curve Equation: Not Given

R^2= *

High-Cube Parcel Hub Warehouse
(156)

Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 902
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
6.77	6.77 - 6.77	***

Data Plot and Equation

Caution – Small Sample Size

High-Cube Parcel Hub Warehouse
(156)

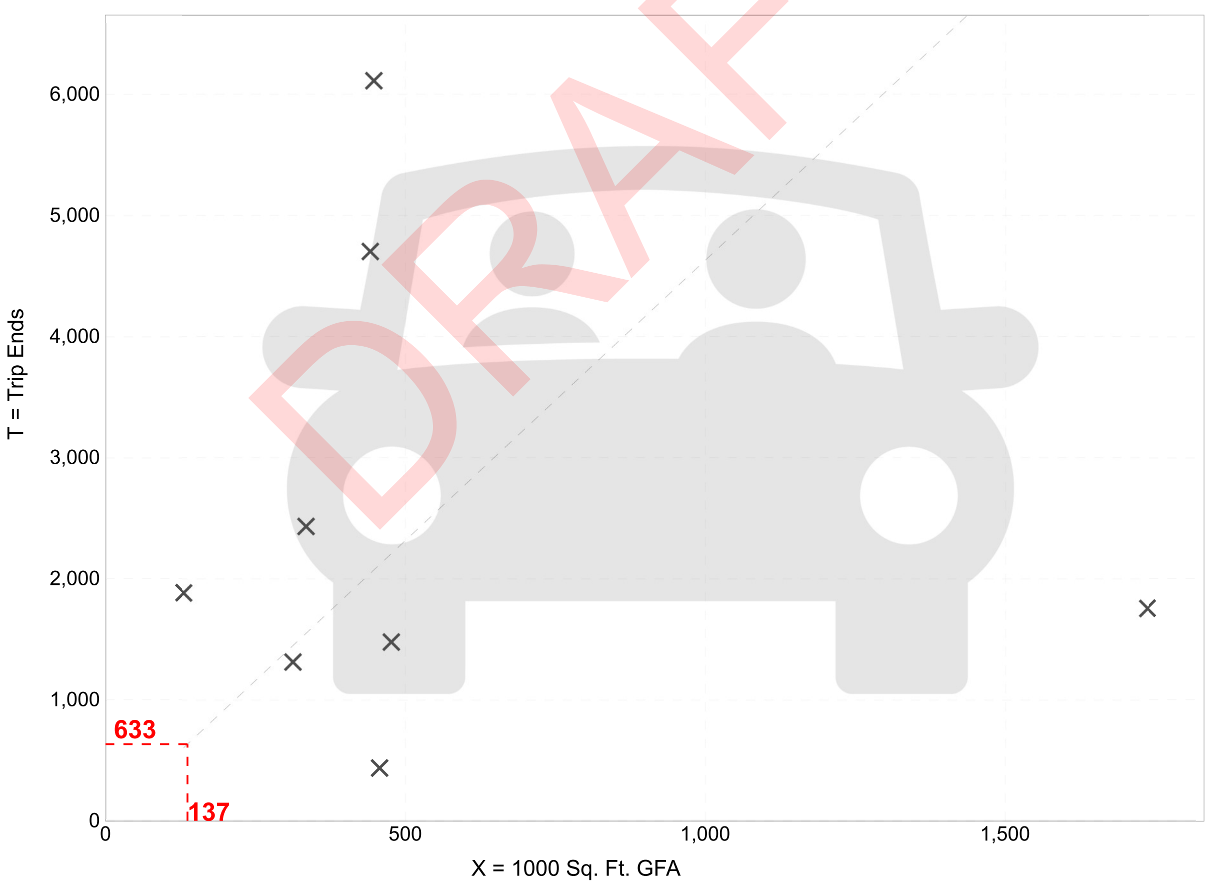
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 8
Avg. 1000 Sq. Ft. GFA: 543
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.63	0.95 - 14.38	5.06

Data Plot and Equation



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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High-Cube Parcel Hub Warehouse
(156)

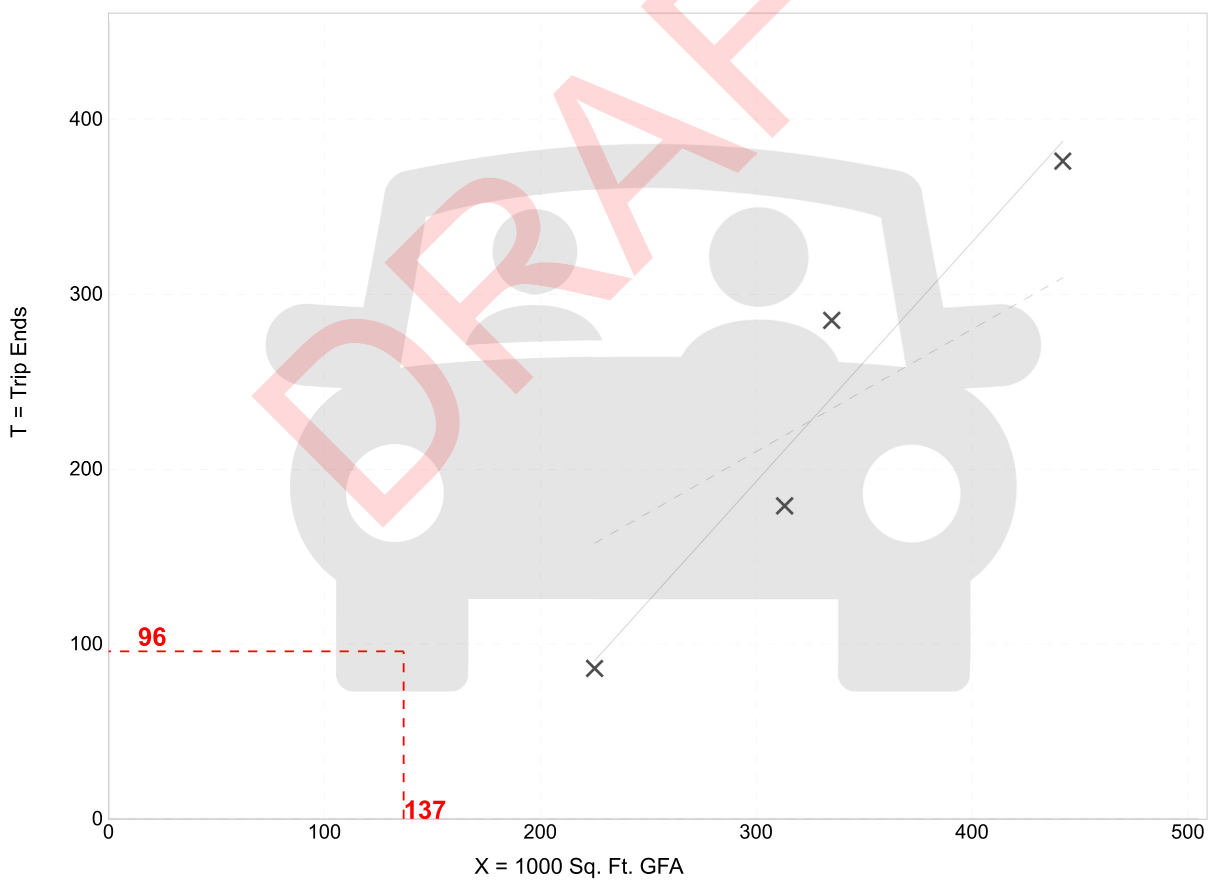
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 329
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.70	0.38 - 0.85	0.21

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** —— **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: T = 1.37(X) - 218.14 **R^2= 0.93**

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High-Cube Parcel Hub Warehouse
(156)

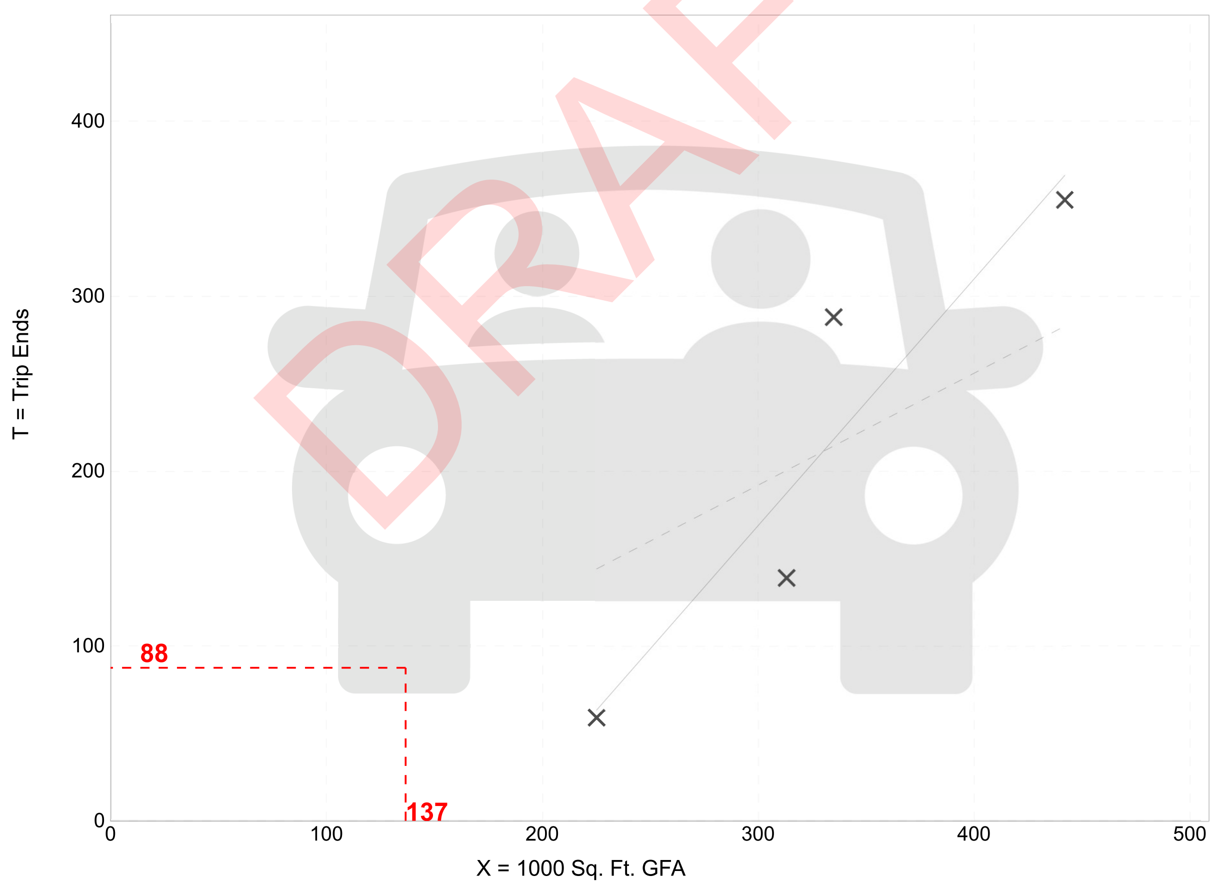
Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	4
Avg. 1000 Sq. Ft. GFA:	329
Directional Distribution:	68% entering, 32% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.64	0.26 - 0.86	0.27

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: $T = 1.41(X) - 254.12$ **$R^2 = 0.86$**

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High-Cube Parcel Hub Warehouse
(156)

Truck Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. 1000 Sq. Ft. GFA: 615
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.58	0.05 - 3.61	1.00

Data Plot and Equation

× **Study Site** — — — — **Average Rate**

Fitted Curve Equation: Not Given **R^2= ****

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High-Cube Parcel Hub Warehouse
(156)

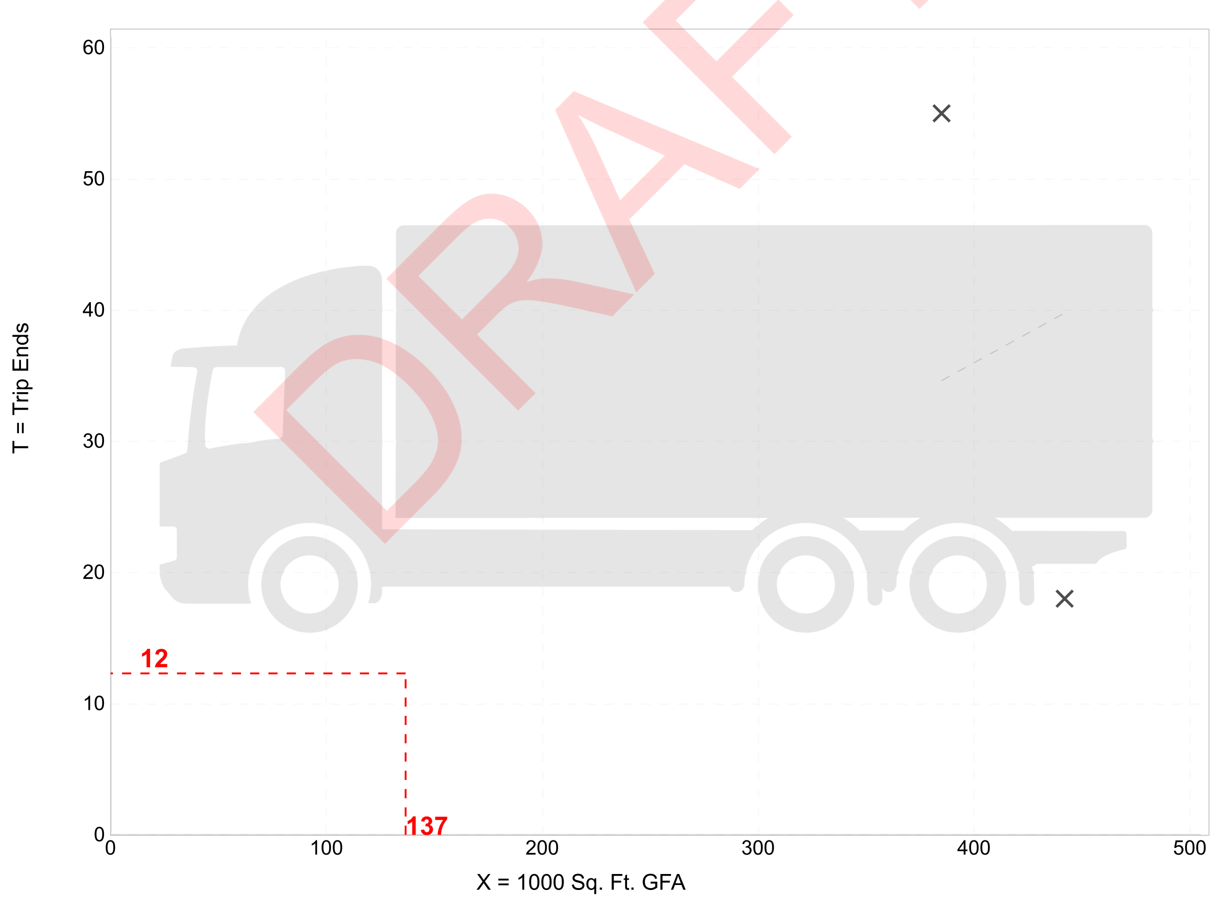
Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	2
Avg. 1000 Sq. Ft. GFA:	414
Directional Distribution:	Not Available

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.09	0.04 - 0.14	*

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

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High-Cube Parcel Hub Warehouse
(156)

Truck Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	2
Avg. 1000 Sq. Ft. GFA:	414
Directional Distribution:	Not Available

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.06	0.01 - 0.12	*

Data Plot and Equation

Caution – Small Sample Size

× **Study Site** - - - - **Average Rate**

Fitted Curve Equation: Not Given **R^2= ******

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use

Source: ITE *Trip Generation Manual* , 11th Edition

Land Use Code	140		
Land Use	Manufacturing		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	20		
	% of 24-Hour Vehicle Trips		
Time	Total	Entering	Exiting
12:00 - 1:00 AM	1.2%	0.4%	2.0%
1:00 - 2:00 AM	0.9%	0.3%	1.4%
2:00 - 3:00 AM	0.7%	0.3%	1.0%
3:00 - 4:00 AM	0.5%	0.4%	0.7%
4:00 - 5:00 AM	0.8%	1.3%	0.3%
5:00 - 6:00 AM	1.6%	3.0%	0.1%
6:00 - 7:00 AM	9.9%	17.1%	2.6%
7:00 - 8:00 AM	8.5%	13.7%	3.2%
8:00 - 9:00 AM	4.4%	6.2%	2.7%
9:00 - 10:00 AM	3.4%	3.9%	3.0%
10:00 - 11:00 AM	3.2%	3.3%	3.0%
11:00 - 12:00 PM	5.6%	6.3%	4.9%
12:00 - 1:00 PM	7.6%	8.9%	6.3%
1:00 - 2:00 PM	6.7%	6.7%	6.7%
2:00 - 3:00 PM	6.1%	5.1%	7.1%
3:00 - 4:00 PM	14.9%	9.4%	20.6%
4:00 - 5:00 PM	7.4%	3.4%	11.5%
5:00 - 6:00 PM	6.1%	2.6%	9.6%
6:00 - 7:00 PM	1.9%	1.2%	2.7%
7:00 - 8:00 PM	1.3%	1.1%	1.5%
8:00 - 9:00 PM	1.2%	1.0%	1.5%
9:00 - 10:00 PM	1.6%	1.2%	2.1%
10:00 - 11:00 PM	2.0%	1.7%	2.4%
11:00 - 12:00 AM	2.3%	1.3%	3.1%

Hourly Distribution of Entering and Exiting Truck Trips by Land Use

Source: ITE *Trip Generation Manual* , 11th Edition

Land Use Code	140		
Land Use	Manufacturing		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	19		
	% of 24-Hour Truck Trips		
Time	Total	Entering	Exiting
12:00 - 1:00 AM	0.5%	0.5%	0.5%
1:00 - 2:00 AM	0.6%	0.5%	0.7%
2:00 - 3:00 AM	0.7%	0.5%	0.9%
3:00 - 4:00 AM	1.3%	0.9%	1.6%
4:00 - 5:00 AM	0.9%	1.2%	0.7%
5:00 - 6:00 AM	0.0%	0.0%	0.0%
6:00 - 7:00 AM	4.2%	4.9%	3.5%
7:00 - 8:00 AM	4.4%	5.1%	3.7%
8:00 - 9:00 AM	7.8%	7.9%	7.7%
9:00 - 10:00 AM	10.2%	10.0%	10.3%
10:00 - 11:00 AM	11.1%	12.3%	9.8%
11:00 - 12:00 PM	9.7%	9.8%	9.6%
12:00 - 1:00 PM	7.8%	7.0%	8.7%
1:00 - 2:00 PM	7.6%	9.1%	6.1%
2:00 - 3:00 PM	6.8%	5.8%	7.7%
3:00 - 4:00 PM	9.7%	8.6%	10.8%
4:00 - 5:00 PM	4.9%	4.2%	5.6%
5:00 - 6:00 PM	3.6%	3.5%	3.7%
6:00 - 7:00 PM	2.1%	2.1%	2.1%
7:00 - 8:00 PM	1.4%	1.9%	0.9%
8:00 - 9:00 PM	1.5%	1.4%	1.6%
9:00 - 10:00 PM	1.2%	1.6%	0.7%
10:00 - 11:00 PM	0.9%	0.5%	1.4%
11:00 - 12:00 AM	1.2%	0.9%	1.4%

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use

Source: ITE *Trip Generation Manual* , 11th Edition

Vehicle Type	All							
Land Use Code	140							
Land Use	Manufacturing							
Setting	General Urban/Suburban							
Time Period	Weekday							
Source	ITE Hourly Data		ITE Daily and Peak Hour Data		Adjustment Factors		Adjusted Hourly Distribution	
# Data Sites	20		53 Daily, 48 AM, 55 PM					
	% of 24-Hour Vehicle Trips						% of 24-Hour Vehicle Trips	
Time (15-min beginning)	Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting
12:00 AM	0.1%	0.5%			0.84	0.86	0.1%	0.4%
12:15 AM	0.1%	0.5%			0.84	0.86	0.1%	0.4%
12:30 AM	0.1%	0.5%			0.84	0.86	0.1%	0.4%
12:45 AM	0.1%	0.5%			0.84	0.86	0.1%	0.4%
1:00 AM	0.1%	0.4%			0.84	0.86	0.1%	0.3%
1:15 AM	0.1%	0.4%			0.84	0.86	0.1%	0.3%
1:30 AM	0.1%	0.4%			0.84	0.86	0.1%	0.3%
1:45 AM	0.1%	0.4%			0.84	0.86	0.1%	0.3%
2:00 AM	0.1%	0.3%			0.84	0.86	0.1%	0.2%
2:15 AM	0.1%	0.3%			0.84	0.86	0.1%	0.2%
2:30 AM	0.1%	0.3%			0.84	0.86	0.1%	0.2%
2:45 AM	0.1%	0.3%			0.84	0.86	0.1%	0.2%
3:00 AM	0.1%	0.2%			0.84	0.86	0.1%	0.1%
3:15 AM	0.1%	0.2%			0.84	0.86	0.1%	0.1%
3:30 AM	0.1%	0.2%			0.84	0.86	0.1%	0.1%
3:45 AM	0.1%	0.2%			0.84	0.86	0.1%	0.1%
4:00 AM	0.3%	0.1%			0.84	0.86	0.3%	0.1%
4:15 AM	0.3%	0.1%			0.84	0.86	0.3%	0.1%
4:30 AM	0.3%	0.1%			0.84	0.86	0.3%	0.1%
4:45 AM	0.3%	0.1%			0.84	0.86	0.3%	0.1%
5:00 AM	0.8%	0.0%			0.84	0.86	0.6%	0.0%
5:15 AM	0.8%	0.0%			0.84	0.86	0.6%	0.0%
5:30 AM	0.8%	0.0%			0.84	0.86	0.6%	0.0%
5:45 AM	0.8%	0.0%			0.84	0.86	0.6%	0.0%
6:00 AM	4.3%	0.7%			0.84	0.86	3.6%	0.6%
6:15 AM	4.3%	0.7%			0.84	0.86	3.6%	0.6%
6:30 AM	4.3%	0.7%			0.84	0.86	3.6%	0.6%
6:45 AM	4.3%	0.7%			0.84	0.86	3.6%	0.6%
7:00 AM	3.4%	0.8%			0.84	0.86	2.9%	0.7%
7:15 AM	3.4%	0.8%			1.67	1.98	5.7%	1.6%
7:30 AM	3.4%	0.8%			1.67	1.98	5.7%	1.6%
7:45 AM	3.4%	0.8%			1.67	1.98	5.7%	1.6%
8:00 AM	1.6%	0.7%			1.67	1.98	2.6%	1.3%
8:15 AM	1.6%	0.7%			0.84	0.86	1.3%	0.6%
8:30 AM	1.6%	0.7%			0.84	0.86	1.3%	0.6%
8:45 AM	1.6%	0.7%			0.84	0.86	1.3%	0.6%
9:00 AM	1.0%	0.7%			0.84	0.86	0.8%	0.6%
9:15 AM	1.0%	0.7%			0.84	0.86	0.8%	0.6%
9:30 AM	1.0%	0.7%			0.84	0.86	0.8%	0.6%
9:45 AM	1.0%	0.7%			0.84	0.86	0.8%	0.6%
10:00 AM	0.8%	0.8%			0.84	0.86	0.7%	0.7%
10:15 AM	0.8%	0.8%			0.84	0.86	0.7%	0.7%
10:30 AM	0.8%	0.8%			0.84	0.86	0.7%	0.7%
10:45 AM	0.8%	0.8%			0.84	0.86	0.7%	0.7%
11:00 AM	1.6%	1.2%			0.84	0.86	1.3%	1.0%
11:15 AM	1.6%	1.2%			0.84	0.86	1.3%	1.0%
11:30 AM	1.6%	1.2%			0.84	0.86	1.3%	1.0%
11:45 AM	1.6%	1.2%			0.84	0.86	1.3%	1.0%
12:00 PM	2.2%	1.6%			0.84	0.86	1.9%	1.4%
12:15 PM	2.2%	1.6%			0.84	0.86	1.9%	1.4%
12:30 PM	2.2%	1.6%			0.84	0.86	1.9%	1.4%
12:45 PM	2.2%	1.6%			0.84	0.86	1.9%	1.4%
1:00 PM	1.7%	1.7%			0.84	0.86	1.4%	1.4%
1:15 PM	1.7%	1.7%			0.84	0.86	1.4%	1.4%
1:30 PM	1.7%	1.7%			0.84	0.86	1.4%	1.4%
1:45 PM	1.7%	1.7%			0.84	0.86	1.4%	1.4%
2:00 PM	1.3%	1.8%			0.84	0.86	1.1%	1.5%
2:15 PM	1.3%	1.8%			0.84	0.86	1.1%	1.5%
2:30 PM	1.3%	1.8%			0.84	0.86	1.1%	1.5%
2:45 PM	1.3%	1.8%			0.84	0.86	1.1%	1.5%
3:00 PM	2.3%	5.2%			0.84	0.86	2.0%	4.4%
3:15 PM	2.3%	5.2%			0.84	0.86	2.0%	4.4%
3:30 PM	2.3%	5.2%			0.84	0.86	2.0%	4.4%
3:45 PM	2.3%	5.2%			0.84	0.86	2.0%	4.4%
4:00 PM	0.9%	2.9%			0.84	0.86	0.7%	2.5%
4:15 PM	0.9%	2.9%			0.84	0.86	0.7%	2.5%
4:30 PM	0.9%	2.9%			2.87	1.85	2.5%	5.3%
4:45 PM	0.9%	2.9%			2.87	1.85	2.5%	5.3%
5:00 PM	0.6%	2.4%			2.87	1.85	1.9%	4.4%
5:15 PM	0.6%	2.4%			2.87	1.85	1.9%	4.4%
5:30 PM	0.6%	2.4%			0.84	0.86	0.5%	2.1%
5:45 PM	0.6%	2.4%			0.84	0.86	0.5%	2.1%
6:00 PM	0.3%	0.7%			0.84	0.86	0.3%	0.6%
6:15 PM	0.3%	0.7%			0.84	0.86	0.3%	0.6%
6:30 PM	0.3%	0.7%			0.84	0.86	0.3%	0.6%
6:45 PM	0.3%	0.7%			0.84	0.86	0.3%	0.6%
7:00 PM	0.3%	0.4%			0.84	0.86	0.2%	0.3%
7:15 PM	0.3%	0.4%			0.84	0.86	0.2%	0.3%
7:30 PM	0.3%	0.4%			0.84	0.86	0.2%	0.3%
7:45 PM	0.3%	0.4%			0.84	0.86	0.2%	0.3%
8:00 PM	0.2%	0.4%			0.84	0.86	0.2%	0.3%
8:15 PM	0.2%	0.4%			0.84	0.86	0.2%	0.3%
8:30 PM	0.2%	0.4%			0.84	0.86	0.2%	0.3%
8:45 PM	0.2%	0.4%			0.84	0.86	0.2%	0.3%
9:00 PM	0.3%	0.5%			0.84	0.86	0.3%	0.5%
9:15 PM	0.3%	0.5%			0.84	0.86	0.3%	0.5%
9:30 PM	0.3%	0.5%			0.84	0.86	0.3%	0.5%
9:45 PM	0.3%	0.5%			0.84	0.86	0.3%	0.5%
10:00 PM	0.4%	0.6%			0.84	0.86	0.4%	0.5%
10:15 PM	0.4%	0.6%			0.84	0.86	0.4%	0.5%
10:30 PM	0.4%	0.6%			0.84	0.86	0.4%	0.5%
10:45 PM	0.4%	0.6%			0.84	0.86	0.4%	0.5%
11:00 PM	0.3%	0.8%			0.84	0.86	0.3%	0.7%
11:15 PM	0.3%	0.8%			0.84	0.86	0.3%	0.7%
11:30 PM	0.3%	0.8%			0.84	0.86	0.3%	0.7%
11:45 PM	0.3%	0.8%			0.84	0.86	0.3%	0.7%
AM Peak Hour (7:15 to 8:15 AM)	11.9%	3.1%	19.8%	6.1%	1.67	1.98	19.8%	6.1%
PM Peak Hour (4:30 to 5:30 PM)	3.0%	10.6%	8.6%	19.5%	2.87	1.85	8.6%	19.5%

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use								
Source: ITE *Trip Generation Manual* , 11th Edition								
Vehicle Type	Truck							
Land Use Code	140							
Land Use	Manufacturing							
Setting	General Urban/Suburban							
Time Period	Weekday							
Source	ITE Hourly Data		ITE Daily and Peak Hour Data		Adjustment Factors		Adjusted Hourly Distribution	
# Data Sites	19		19 Daily, 19 AM, 18 PM					
	% of 24-Hour Vehicle Trips						% of 24-Hour Vehicle Trips	
Time (15-min beginning)	Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting
12:00 AM	0.1%	0.1%			0.96	0.96	0.1%	0.1%
12:15 AM	0.1%	0.1%			0.96	0.96	0.1%	0.1%
12:30 AM	0.1%	0.1%			0.96	0.96	0.1%	0.1%
12:45 AM	0.1%	0.1%			0.96	0.96	0.1%	0.1%
1:00 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
1:15 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
1:30 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
1:45 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
2:00 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
2:15 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
2:30 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
2:45 AM	0.1%	0.2%			0.96	0.96	0.1%	0.2%
3:00 AM	0.2%	0.4%			0.96	0.96	0.2%	0.4%
3:15 AM	0.2%	0.4%			0.96	0.96	0.2%	0.4%
3:30 AM	0.2%	0.4%			0.96	0.96	0.2%	0.4%
3:45 AM	0.2%	0.4%			0.96	0.96	0.2%	0.4%
4:00 AM	0.3%	0.2%			0.96	0.96	0.3%	0.2%
4:15 AM	0.3%	0.2%			0.96	0.96	0.3%	0.2%
4:30 AM	0.3%	0.2%			0.96	0.96	0.3%	0.2%
4:45 AM	0.3%	0.2%			0.96	0.96	0.3%	0.2%
5:00 AM	0.0%	0.0%			0.96	0.96	0.0%	0.0%
5:15 AM	0.0%	0.0%			0.96	0.96	0.0%	0.0%
5:30 AM	0.0%	0.0%			0.96	0.96	0.0%	0.0%
5:45 AM	0.0%	0.0%			0.96	0.96	0.0%	0.0%
6:00 AM	1.2%	0.9%			0.96	0.96	1.2%	0.8%
6:15 AM	1.2%	0.9%			0.96	0.96	1.2%	0.8%
6:30 AM	1.2%	0.9%			0.96	0.96	1.2%	0.8%
6:45 AM	1.2%	0.9%			0.96	0.96	1.2%	0.8%
7:00 AM	1.3%	0.9%			0.96	0.96	1.2%	0.9%
7:15 AM	1.3%	0.9%			1.11	1.36	1.4%	1.3%
7:30 AM	1.3%	0.9%			1.11	1.36	1.4%	1.3%
7:45 AM	1.3%	0.9%			1.11	1.36	1.4%	1.3%
8:00 AM	2.0%	1.9%			1.11	1.36	2.2%	2.6%
8:15 AM	2.0%	1.9%			0.96	0.96	1.9%	1.9%
8:30 AM	2.0%	1.9%			0.96	0.96	1.9%	1.9%
8:45 AM	2.0%	1.9%			0.96	0.96	1.9%	1.9%
9:00 AM	2.5%	2.6%			0.96	0.96	2.4%	2.5%
9:15 AM	2.5%	2.6%			0.96	0.96	2.4%	2.5%
9:30 AM	2.5%	2.6%			0.96	0.96	2.4%	2.5%
9:45 AM	2.5%	2.6%			0.96	0.96	2.4%	2.5%
10:00 AM	3.1%	2.5%			0.96	0.96	3.0%	2.4%
10:15 AM	3.1%	2.5%			0.96	0.96	3.0%	2.4%
10:30 AM	3.1%	2.5%			0.96	0.96	3.0%	2.4%
10:45 AM	3.1%	2.5%			0.96	0.96	3.0%	2.4%
11:00 AM	2.4%	2.4%			0.96	0.96	2.4%	2.3%
11:15 AM	2.4%	2.4%			0.96	0.96	2.4%	2.3%
11:30 AM	2.4%	2.4%			0.96	0.96	2.4%	2.3%
11:45 AM	2.4%	2.4%			0.96	0.96	2.4%	2.3%
12:00 PM	1.7%	2.2%			0.96	0.96	1.7%	2.1%
12:15 PM	1.7%	2.2%			0.96	0.96	1.7%	2.1%
12:30 PM	1.7%	2.2%			0.96	0.96	1.7%	2.1%
12:45 PM	1.7%	2.2%			0.96	0.96	1.7%	2.1%
1:00 PM	2.3%	1.5%			0.96	0.96	2.2%	1.5%
1:15 PM	2.3%	1.5%			0.96	0.96	2.2%	1.5%
1:30 PM	2.3%	1.5%			0.96	0.96	2.2%	1.5%
1:45 PM	2.3%	1.5%			0.96	0.96	2.2%	1.5%
2:00 PM	1.5%	1.9%			0.96	0.96	1.4%	1.9%
2:15 PM	1.5%	1.9%			0.96	0.96	1.4%	1.9%
2:30 PM	1.5%	1.9%			0.96	0.96	1.4%	1.9%
2:45 PM	1.5%	1.9%			0.96	0.96	1.4%	1.9%
3:00 PM	2.2%	2.7%			0.96	0.96	2.1%	2.6%
3:15 PM	2.2%	2.7%			0.96	0.96	2.1%	2.6%
3:30 PM	2.2%	2.7%			0.96	0.96	2.1%	2.6%
3:45 PM	2.2%	2.7%			0.96	0.96	2.1%	2.6%
4:00 PM	1.0%	1.4%			0.96	0.96	1.0%	1.4%
4:15 PM	1.0%	1.4%			0.96	0.96	1.0%	1.4%
4:30 PM	1.0%	1.4%			1.68	1.38	1.8%	1.9%
4:45 PM	1.0%	1.4%			1.68	1.38	1.8%	1.9%
5:00 PM	0.9%	0.9%			1.68	1.38	1.5%	1.3%
5:15 PM	0.9%	0.9%			1.68	1.38	1.5%	1.3%
5:30 PM	0.9%	0.9%			0.96	0.96	0.8%	0.9%
5:45 PM	0.9%	0.9%			0.96	0.96	0.8%	0.9%
6:00 PM	0.5%	0.5%			0.96	0.96	0.5%	0.5%
6:15 PM	0.5%	0.5%			0.96	0.96	0.5%	0.5%
6:30 PM	0.5%	0.5%			0.96	0.96	0.5%	0.5%
6:45 PM	0.5%	0.5%			0.96	0.96	0.5%	0.5%
7:00 PM	0.5%	0.2%			0.96	0.96	0.4%	0.2%
7:15 PM	0.5%	0.2%			0.96	0.96	0.4%	0.2%
7:30 PM	0.5%	0.2%			0.96	0.96	0.4%	0.2%
7:45 PM	0.5%	0.2%			0.96	0.96	0.4%	0.2%
8:00 PM	0.3%	0.4%			0.96	0.96	0.3%	0.4%
8:15 PM	0.3%	0.4%			0.96	0.96	0.3%	0.4%
8:30 PM	0.3%	0.4%			0.96	0.96	0.3%	0.4%
8:45 PM	0.3%	0.4%			0.96	0.96	0.3%	0.4%
9:00 PM	0.4%	0.2%			0.96	0.96	0.4%	0.2%
9:15 PM	0.4%	0.2%			0.96	0.96	0.4%	0.2%
9:30 PM	0.4%	0.2%			0.96	0.96	0.4%	0.2%
9:45 PM	0.4%	0.2%			0.96	0.96	0.4%	0.2%
10:00 PM	0.1%	0.4%			0.96	0.96	0.1%	0.3%
10:15 PM	0.1%	0.4%			0.96	0.96	0.1%	0.3%
10:30 PM	0.1%	0.4%			0.96	0.96	0.1%	0.3%
10:45 PM	0.1%	0.4%			0.96	0.96	0.1%	0.3%
11:00 PM	0.2%	0.4%			0.96	0.96	0.2%	0.3%
11:15 PM	0.2%	0.4%			0.96	0.96	0.2%	0.3%
11:30 PM	0.2%	0.4%			0.96	0.96	0.2%	0.3%
11:45 PM	0.2%	0.4%			0.96	0.96	0.2%	0.3%
AM Peak Hour (7:15 to 8:15 AM)	5.8%	4.7%	6.5%	6.5%	1.11	1.36	6.5%	6.5%
PM Peak Hour (4:30 to 5:30 PM)	3.8%	4.7%	6.5%	6.5%	1.68	1.38	6.5%	6.5%

TRAFFIC SIGNAL WARRANTS

Traffic Signal Warrant Analysis Workbook

STUDY AND ANALYSIS INFORMATION

Municipality:	Sacramento City	Analysis Date:	10/26/2021
County:	Sacramento County	Conducted By:	VJM
		Agency/Company Name:	DKS Associates

Analysis Information

Data Collection Date: 10/13/2021
Day of the Week: Wednesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number: S. Watt Avenue
Major Street Approach #1 Direction: S-Bound
Major Street Approach #2 Direction: N-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 1 LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: 55 MPH

Minor Street Information

Minor Street Name and Route Number: Osage Avenue
Minor Street Approach #1 Direction: E-Bound
Minor Street Approach #2 Direction: W-Bound

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	Yes
Warrant 2, Four-Hour Vehicular Volume	Yes	Yes
Warrant 3, Peak Hour	Yes	No
Warrant 4, Pedestrian Volume	No	N/A
Warrant 5, School Crossing	No	N/A
Warrant 6, Coordinated Signal System	No	N/A
Warrant 7, Crash Experience	No	N/A
Warrant 8, Roadway Network	No	N/A
Warrant 9, Intersection Near a Grade Crossing	No	N/A
Bicycle Signal Warrant (CA)	No	N/A

Traffic Signal Warrant Analysis Workbook

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH						
Time Interval		Major Street Approach #1 (S-Bound)	Major Street Approach #2 (N-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 AM	12:14 AM			0		
12:15 AM	12:29 AM			0		
12:30 AM	12:44 AM			0		
12:45 AM	12:59 AM			0		
1:00 AM	1:14 AM			0		
1:15 AM	1:29 AM			0		
1:30 AM	1:44 AM			0		
1:45 AM	1:59 AM			0		
2:00 AM	2:14 AM			0		
2:15 AM	2:29 AM			0		
2:30 AM	2:44 AM			0		
2:45 AM	2:59 AM			0		
3:00 AM	3:14 AM			0		
3:15 AM	3:29 AM			0		
3:30 AM	3:44 AM			0		
3:45 AM	3:59 AM			0		
4:00 AM	4:14 AM			0		
4:15 AM	4:29 AM			0		
4:30 AM	4:44 AM			0		
4:45 AM	4:59 AM			0		
5:00 AM	5:14 AM			0		
5:15 AM	5:29 AM			0		
5:30 AM	5:44 AM			0		
5:45 AM	5:59 AM			0		
6:00 AM	6:14 AM	127	201	329	16	3
6:15 AM	6:29 AM	150	197	348	7	3
6:30 AM	6:44 AM	140	197	338	15	6
6:45 AM	6:59 AM	248	202	451	16	2
7:00 AM	7:14 AM	190	201	391	14	6
7:15 AM	7:29 AM	165	249	414	13	7
7:30 AM	7:44 AM	204	252	456	10	6
7:45 AM	7:59 AM	201	238	439	11	7
8:00 AM	8:14 AM	177	267	444	8	6
8:15 AM	8:29 AM	168	226	394	6	3
8:30 AM	8:44 AM	180	240	420	10	3
8:45 AM	8:59 AM	162	197	359	5	6
9:00 AM	9:14 AM	158	179	337	5	3
9:15 AM	9:29 AM	157	170	327	8	3
9:30 AM	9:44 AM	149	181	330	13	3
9:45 AM	9:59 AM	172	167	339	11	4
10:00 AM	10:14 AM	135	137	272	12	3
10:15 AM	10:29 AM	153	153	306	9	3
10:30 AM	10:44 AM	148	151	299	5	3
10:45 AM	10:59 AM	139	134	273	13	4
11:00 AM	11:14 AM	148	144	292	7	5
11:15 AM	11:29 AM	143	126	269	10	5
11:30 AM	11:44 AM	172	146	318	6	4
11:45 AM	11:59 AM	177	135	312	8	5

Traffic Signal Warrant Analysis Workbook

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH						
Time Interval		Major Street Approach #1 (S-Bound)	Major Street Approach #2 (N-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 PM	12:14 PM	189	133	322	9	5
12:15 PM	12:29 PM	144	151	295	11	5
12:30 PM	12:44 PM	180	183	363	7	5
12:45 PM	12:59 PM	177	143	320	6	6
1:00 PM	1:14 PM	188	122	310	6	6
1:15 PM	1:29 PM	179	155	334	5	7
1:30 PM	1:44 PM	188	131	319	6	5
1:45 PM	1:59 PM	236	169	405	10	5
2:00 PM	2:14 PM	201	171	372	14	6
2:15 PM	2:29 PM	218	167	385	4	6
2:30 PM	2:44 PM	207	188	395	6	8
2:45 PM	2:59 PM	186	157	343	23	8
3:00 PM	3:14 PM	206	146	352	19	17
3:15 PM	3:29 PM	191	158	349	7	16
3:30 PM	3:44 PM	204	191	395	14	16
3:45 PM	3:59 PM	192	168	360	9	16
4:00 PM	4:14 PM	206	160	367	11	10
4:15 PM	4:29 PM	192	157	350	9	10
4:30 PM	4:44 PM	217	185	403	10	20
4:45 PM	4:59 PM	180	159	340	8	21
5:00 PM	5:14 PM	231	181	412	18	17
5:15 PM	5:29 PM	223	172	395	5	17
5:30 PM	5:44 PM	195	159	354	4	8
5:45 PM	5:59 PM	203	137	340	5	7
6:00 PM	6:14 PM	170	134	304	3	4
6:15 PM	6:29 PM	197	117	314	2	3
6:30 PM	6:44 PM	170	116	286	1	4
6:45 PM	6:59 PM	174	119	293	2	4
7:00 PM	7:14 PM	173	94	267	2	2
7:15 PM	7:29 PM	128	66	194	0	3
7:30 PM	7:44 PM	108	73	181	0	3
7:45 PM	7:59 PM	133	70	203	1	1
8:00 PM	8:14 PM	109	84	193	5	1
8:15 PM	8:29 PM	108	75	183	1	1
8:30 PM	8:44 PM	113	69	182	1	1
8:45 PM	8:59 PM	74	72	146	0	2
9:00 PM	9:14 PM	76	65	141	0	2
9:15 PM	9:29 PM	84	45	129	0	2
9:30 PM	9:44 PM	73	65	138	1	2
9:45 PM	9:59 PM	71	46	117	0	2
10:00 PM	10:14 PM			0		
10:15 PM	10:29 PM			0		
10:30 PM	10:44 PM			0		
10:45 PM	10:59 PM			0		
11:00 PM	11:14 PM			0		
11:15 PM	11:29 PM			0		
11:30 PM	11:44 PM			0		
11:45 PM	11:59 PM			0		
Approach Totals:		10,654	9,654	20,308	483	387

Traffic Signal Warrant Analysis Workbook

11/6/2021

Time Interval		Major Street Left Turn #1 (S-Bound)	Major Street Left Turn #2 (N-Bound)
Begin At	End Of	Volume	Volume
12:00 AM	12:14 AM		
12:15 AM	12:29 AM		
12:30 AM	12:44 AM		
12:45 AM	12:59 AM		
1:00 AM	1:14 AM		
1:15 AM	1:29 AM		
1:30 AM	1:44 AM		
1:45 AM	1:59 AM		
2:00 AM	2:14 AM		
2:15 AM	2:29 AM		
2:30 AM	2:44 AM		
2:45 AM	2:59 AM		
3:00 AM	3:14 AM		
3:15 AM	3:29 AM		
3:30 AM	3:44 AM		
3:45 AM	3:59 AM		
4:00 AM	4:14 AM		
4:15 AM	4:29 AM		
4:30 AM	4:44 AM		
4:45 AM	4:59 AM		
5:00 AM	5:14 AM		
5:15 AM	5:29 AM		
5:30 AM	5:44 AM		
5:45 AM	5:59 AM		
6:00 AM	6:14 AM	8	6
6:15 AM	6:29 AM	10	11
6:30 AM	6:44 AM	8	18
6:45 AM	6:59 AM	10	7
7:00 AM	7:14 AM	6	5
7:15 AM	7:29 AM	12	5
7:30 AM	7:44 AM	12	3
7:45 AM	7:59 AM	13	9
8:00 AM	8:14 AM	6	5
8:15 AM	8:29 AM	3	2
8:30 AM	8:44 AM	4	2
8:45 AM	8:59 AM	5	1
9:00 AM	9:14 AM	3	1
9:15 AM	9:29 AM	3	3
9:30 AM	9:44 AM	4	1
9:45 AM	9:59 AM	3	6
10:00 AM	10:14 AM	3	4
10:15 AM	10:29 AM	2	2
10:30 AM	10:44 AM	2	1
10:45 AM	10:59 AM	4	3
11:00 AM	11:14 AM	6	3
11:15 AM	11:29 AM	4	3
11:30 AM	11:44 AM	6	2
11:45 AM	11:59 AM	4	0

Yes — Use California MUTCD option:
At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher volume of the major-street left-turn volumes plus the higher volume minor-street approach as the "minor-street" volume and both approaches of the major street minus the higher of the major-street left-turn volume as "major-street" volume.

If this option is selected, populate columns HB and HC and select "Yes"

Traffic Signal Warrant Analysis Workbook

11/6/2021

Time Interval		Major Street Left Turn #1 (S-Bound)	Major Street Left Turn #2 (N-Bound)
Begin At	End Of	Volume	Volume
12:00 PM	12:14 PM	7	2
12:15 PM	12:29 PM	5	2
12:30 PM	12:44 PM	7	1
12:45 PM	12:59 PM	6	0
1:00 PM	1:14 PM	4	2
1:15 PM	1:29 PM	5	1
1:30 PM	1:44 PM	4	0
1:45 PM	1:59 PM	7	1
2:00 PM	2:14 PM	4	5
2:15 PM	2:29 PM	6	0
2:30 PM	2:44 PM	6	2
2:45 PM	2:59 PM	10	0
3:00 PM	3:14 PM	8	1
3:15 PM	3:29 PM	8	0
3:30 PM	3:44 PM	9	3
3:45 PM	3:59 PM	14	0
4:00 PM	4:14 PM	9	0
4:15 PM	4:29 PM	8	0
4:30 PM	4:44 PM	14	0
4:45 PM	4:59 PM	9	1
5:00 PM	5:14 PM	17	1
5:15 PM	5:29 PM	12	1
5:30 PM	5:44 PM	4	0
5:45 PM	5:59 PM	8	0
6:00 PM	6:14 PM	2	0
6:15 PM	6:29 PM	3	2
6:30 PM	6:44 PM	3	0
6:45 PM	6:59 PM	1	0
7:00 PM	7:14 PM	3	0
7:15 PM	7:29 PM	1	0
7:30 PM	7:44 PM	1	0
7:45 PM	7:59 PM	1	2
8:00 PM	8:14 PM	2	0
8:15 PM	8:29 PM	1	0
8:30 PM	8:44 PM	1	0
8:45 PM	8:59 PM	1	0
9:00 PM	9:14 PM	1	0
9:15 PM	9:29 PM	2	0
9:30 PM	9:44 PM	1	1
9:45 PM	9:59 PM	3	0
10:00 PM	10:14 PM		
10:15 PM	10:29 PM		
10:30 PM	10:44 PM		
10:45 PM	10:59 PM		
11:00 PM	11:14 PM		
11:15 PM	11:29 PM		
11:30 PM	11:44 PM		
11:45 PM	11:59 PM		
Approach Totals:		356	131

MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2014 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 11 **Condition B Satisfied?** Yes

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-2
7

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Hourly Vehicular Volume			
Hour Interval Beginning At	**Major Street Combined Vehicles Per Hour (VPH)**	**Highest Minor Street Approach Vehicles Per Hour (VPH)**	**Hour Met?**
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	320	24	
5:30 AM	657	42	
5:45 AM	979	73	Met
6:00 AM	1,422	96	Met
6:15 AM	1,486	93	Met
6:30 AM	1,557	95	Met
6:45 AM	1,672	93	Met
7:00 AM	1,658	90	Met
7:15 AM	1,711	84	Met
7:30 AM	1,699	68	Met
7:45 AM	1,671	60	Met
8:00 AM	1,599	46	
8:15 AM	1,495	40	
8:30 AM	1,428	42	
8:45 AM	1,338	45	
9:00 AM	1,320	48	
9:15 AM	1,253	58	
9:30 AM	1,234	58	
9:45 AM	1,203	50	
10:00 AM	1,139	51	
10:15 AM	1,156	49	
10:30 AM	1,118	51	
10:45 AM	1,133	56	
11:00 AM	1,172	50	
11:15 AM	1,201	54	
11:30 AM	1,225	56	
11:45 AM	1,268	59	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
12:00 PM	1,273	59	
12:15 PM	1,265	53	
12:30 PM	1,305	49	
12:45 PM	1,264	46	
1:00 PM	1,349	48	
1:15 PM	1,411	56	
1:30 PM	1,460	56	
1:45 PM	1,534	58	
2:00 PM	1,469	74	Met
2:15 PM	1,445	83	Met
2:30 PM	1,407	88	Met
2:45 PM	1,405	99	Met
3:00 PM	1,418	104	Met
3:15 PM	1,431	98	Met
3:30 PM	1,431	92	Met
3:45 PM	1,434	102	Met
4:00 PM	1,418	102	Met
4:15 PM	1,456	116	Met
4:30 PM	1,497	126	Met
4:45 PM	1,459	104	Met
5:00 PM	1,461	89	Met
5:15 PM	1,368	61	Met
5:30 PM	1,296	39	
5:45 PM	1,229	33	
6:00 PM	1,190	23	
6:15 PM	1,151	22	
6:30 PM	1,033	20	
6:45 PM	930	17	
7:00 PM	840	14	
7:15 PM	767	12	
7:30 PM	756	10	
7:45 PM	757	11	
8:00 PM	700	10	
8:15 PM	649	8	
8:30 PM	594	10	
8:45 PM	550	10	
9:00 PM	519	12	
9:15 PM	379	10	
9:30 PM	252	6	
9:45 PM	114	4	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

MUTCD WARRANT 3, PEAK HOUR

Number of Lines for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	No
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes
**If applicable, attach all supporting calculations and documentation.*	

Total Number of Unique Hours Met On Figure 4C-4
5

Hourly Vehicular Volume			
Hour Interval Beginning At	**Major Street Combined Vehicles Per Hour (VPH)**	**Highest Minor Street Approach Vehicles Per Hour (VPH)**	**Hour Met?**
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	320	24	
5:30 AM	657	42	
5:45 AM	979	73	
6:00 AM	1,422	96	Met
6:15 AM	1,486	93	Met
6:30 AM	1,557	95	Met
6:45 AM	1,672	93	Met
7:00 AM	1,658	90	Met
7:15 AM	1,711	84	Met
7:30 AM	1,699	68	
7:45 AM	1,671	60	
8:00 AM	1,599	46	
8:15 AM	1,495	40	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
8:30 AM	1,428	42	
8:45 AM	1,338	45	
9:00 AM	1,320	48	
9:15 AM	1,253	58	
9:30 AM	1,234	58	
9:45 AM	1,203	50	
10:00 AM	1,139	51	
10:15 AM	1,156	49	
10:30 AM	1,118	51	
10:45 AM	1,133	56	
11:00 AM	1,172	50	
11:15 AM	1,201	54	
11:30 AM	1,225	56	
11:45 AM	1,268	59	
12:00 PM	1,273	59	
12:15 PM	1,265	53	
12:30 PM	1,305	49	
12:45 PM	1,264	46	
1:00 PM	1,349	48	
1:15 PM	1,411	56	
1:30 PM	1,460	56	
1:45 PM	1,534	58	
2:00 PM	1,469	74	
2:15 PM	1,445	83	Met
2:30 PM	1,407	88	Met
2:45 PM	1,405	99	Met
3:00 PM	1,418	104	Met
3:15 PM	1,431	98	Met
3:30 PM	1,431	92	Met
3:45 PM	1,434	102	Met
4:00 PM	1,418	102	Met
4:15 PM	1,456	116	Met
4:30 PM	1,497	126	Met
4:45 PM	1,459	104	Met
5:00 PM	1,461	89	Met
5:15 PM	1,368	61	
5:30 PM	1,296	39	
5:45 PM	1,229	33	
6:00 PM	1,190	23	
6:15 PM	1,151	22	
6:30 PM	1,033	20	
6:45 PM	930	17	
7:00 PM	840	14	
7:15 PM	767	12	
7:30 PM	756	10	
7:45 PM	757	11	
8:00 PM	700	10	
8:15 PM	649	8	
8:30 PM	594	10	
8:45 PM	550	10	
9:00 PM	519	12	
9:15 PM	379	10	
9:30 PM	252	6	
9:45 PM	114	4	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

South Watt Avenue and Osage Avenue
Existing Plus Project
Intersection Delay by Approach

	AM Peak Hour			PM Peak Hour		
	Vehicles	Average Delay (seconds)	Total Delay (hours)	Vehicles	Average Delay (seconds)	Total Delay (hours)
Northbound left turn	22	9.6	0.06	3	9.3	0.01
Southbound left turn	41	10.5	0.12	52	9.3	0.13
Eastbound	42	165.3	1.93	41	74.8	0.85
Westbound	26	40.9	0.30	73	43.9	0.89
Total (Controlled movements)	131	66.0	2.40	169	40.1	1.88

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INTERSECTION OPERATIONS

EXISTING CONDITIONS

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	10	0	0	3	22	955	1	1	671	33
Future Vol, veh/h	32	0	10	0	0	3	22	955	1	1	671	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	38	0	20	0	0	33	23	7	0	0	10	36
Mvmt Flow	32	0	10	0	0	3	22	955	1	1	671	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1691	1690	688	1695	1706	956	704	0	0	956	0	0
Stage 1	690	690	-	1000	1000	-	-	-	-	-	-	-
Stage 2	1001	1000	-	695	706	-	-	-	-	-	-	-
Critical Hdwy	7.48	6.5	6.4	7.1	6.5	6.53	4.33	-	-	4.1	-	-
Critical Hdwy Stg 1	6.48	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.48	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.842	4	3.48	3.5	4	3.597	2.407	-	-	2.2	-	-
Pot Cap-1 Maneuver	60	94	417	74	92	274	804	-	-	727	-	-
Stage 1	382	449	-	295	324	-	-	-	-	-	-	-
Stage 2	252	324	-	436	442	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	88	417	69	86	274	804	-	-	727	-	-
Mov Cap-2 Maneuver	57	88	-	69	86	-	-	-	-	-	-	-
Stage 1	360	448	-	278	305	-	-	-	-	-	-	-
Stage 2	235	305	-	425	441	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	109.3	18.3	0.2	0
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	804	-	-	72	274	727	-	-
HCM Lane V/C Ratio	0.027	-	-	0.583	0.011	0.001	-	-
HCM Control Delay (s)	9.6	0	-	109.3	18.3	10	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	0	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	3	10	0	0	5	3	690	0	26	788	11
Future Vol, veh/h	28	3	10	0	0	5	3	690	0	26	788	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	0	20	0	0	0	0	1	0	4	4	55
Mvmt Flow	28	3	10	0	0	5	3	690	0	26	788	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1545	1542	794	1548	1547	690	799	0	0	690	0	0
Stage 1	846	846	-	696	696	-	-	-	-	-	-	-
Stage 2	699	696	-	852	851	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.4	7.1	6.5	6.2	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.48	3.5	4	3.3	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	92	116	361	94	115	449	833	-	-	895	-	-
Stage 1	354	381	-	435	446	-	-	-	-	-	-	-
Stage 2	427	446	-	357	379	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	109	361	86	108	449	833	-	-	895	-	-
Mov Cap-2 Maneuver	87	109	-	86	108	-	-	-	-	-	-	-
Stage 1	352	361	-	432	443	-	-	-	-	-	-	-
Stage 2	420	443	-	326	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	56.7	13.1	0	0.3
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	833	-	-	109	449	895	-	-
HCM Lane V/C Ratio	0.004	-	-	0.376	0.011	0.029	-	-
HCM Control Delay (s)	9.3	0	-	56.7	13.1	9.1	0	-
HCM Lane LOS	A	A	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0	0.1	-	-

INTERSECTION OPERATIONS

EXISTING PLUS PROJECT CONDITIONS

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	10	8	0	18	22	955	29	41	671	33
Future Vol, veh/h	32	0	10	8	0	18	22	955	29	41	671	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	38	0	20	9	0	13	23	7	3	3	10	36
Mvmt Flow	32	0	10	8	0	18	22	955	29	41	671	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1793	1798	688	1789	1800	970	704	0	0	984	0	0
Stage 1	770	770	-	1014	1014	-	-	-	-	-	-	-
Stage 2	1023	1028	-	775	786	-	-	-	-	-	-	-
Critical Hdwy	7.48	6.5	6.4	7.19	6.5	6.33	4.33	-	-	4.13	-	-
Critical Hdwy Stg 1	6.48	5.5	-	6.19	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.48	5.5	-	6.19	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.842	4	3.48	3.581	4	3.417	2.407	-	-	2.227	-	-
Pot Cap-1 Maneuver	51	81	417	60	81	293	804	-	-	698	-	-
Stage 1	344	413	-	279	319	-	-	-	-	-	-	-
Stage 2	244	314	-	380	406	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	69	417	52	69	293	804	-	-	698	-	-
Mov Cap-2 Maneuver	42	69	-	52	69	-	-	-	-	-	-	-
Stage 1	323	373	-	262	300	-	-	-	-	-	-	-
Stage 2	215	295	-	335	367	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	188.7	42.7	0.2	0.6
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	804	-	-	53	121	698	-	-
HCM Lane V/C Ratio	0.027	-	-	0.792	0.215	0.059	-	-
HCM Control Delay (s)	9.6	0	-	188.7	42.7	10.5	0	-
HCM Lane LOS	A	A	-	F	E	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	0.8	0.2	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	12	7	2	1	17
Future Vol, veh/h	58	12	7	2	1	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	17	43	0	0	0
Mvmt Flow	58	12	7	2	1	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	9	0	-	0	136	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	128	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1624	-	-	-	862	1080
Stage 1	-	-	-	-	1020	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1624	-	-	-	831	1080
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	903	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1624	-	-	-	1062
HCM Lane V/C Ratio	0.036	-	-	-	0.017
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	3	5	1	0	4
Future Vol, veh/h	10	3	5	1	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	0	20	0	0	50
Mvmt Flow	10	3	5	1	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	6	0	-	0	29	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	23	-
Critical Hdwy	4.3	-	-	-	6.4	6.7
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.38	-	-	-	3.5	3.75
Pot Cap-1 Maneuver	1505	-	-	-	991	952
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1505	-	-	-	984	952
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1505	-	-	-	952
HCM Lane V/C Ratio	0.007	-	-	-	0.004
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	3	10	26	0	47	3	690	5	52	788	11
Future Vol, veh/h	28	3	10	26	0	47	3	690	5	52	788	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	0	20	5	0	2	0	1	5	5	4	55
Mvmt Flow	28	3	10	26	0	47	3	690	5	52	788	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1620	1599	794	1603	1602	693	799	0	0	695	0	0
Stage 1	898	898	-	699	699	-	-	-	-	-	-	-
Stage 2	722	701	-	904	903	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.4	7.15	6.5	6.22	4.1	-	-	4.15	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.48	3.545	4	3.318	2.2	-	-	2.245	-	-
Pot Cap-1 Maneuver	82	107	361	84	107	443	833	-	-	887	-	-
Stage 1	331	361	-	426	445	-	-	-	-	-	-	-
Stage 2	415	444	-	327	359	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	67	95	361	73	95	443	833	-	-	887	-	-
Mov Cap-2 Maneuver	67	95	-	73	95	-	-	-	-	-	-	-
Stage 1	329	323	-	423	442	-	-	-	-	-	-	-
Stage 2	369	441	-	282	321	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	80.3	46	0	0.6
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	833	-	-	86	158	887	-	-
HCM Lane V/C Ratio	0.004	-	-	0.477	0.462	0.059	-	-
HCM Control Delay (s)	9.3	0	-	80.3	46	9.3	0	-
HCM Lane LOS	A	A	-	F	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2	2.1	0.2	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	34	15	1	2	57
Future Vol, veh/h	24	34	15	1	2	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	9	13	0	0	0
Mvmt Flow	24	34	15	1	2	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	16	0	-	0	98	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1615	-	-	-	906	1069
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1615	-	-	-	892	1069
Mov Cap-2 Maneuver	-	-	-	-	892	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	946	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1615	-	-	-	1062
HCM Lane V/C Ratio	0.015	-	-	-	0.056
HCM Control Delay (s)	7.3	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	31	6	1	1	10
Future Vol, veh/h	5	31	6	1	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	40	3	0	0	0	20
Mvmt Flow	5	31	6	1	1	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	7	0	-	0	48	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	41	-
Critical Hdwy	4.5	-	-	-	6.4	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.48
Pot Cap-1 Maneuver	1397	-	-	-	967	1025
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1397	-	-	-	963	1025
Mov Cap-2 Maneuver	-	-	-	-	963	-
Stage 1	-	-	-	-	1017	-
Stage 2	-	-	-	-	987	-

Approach	EB		WB		SB	
HCM Control Delay, s	1.1		0		8.6	
HCM LOS					A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1397	-	-	-	1019
HCM Lane V/C Ratio	0.004	-	-	-	0.011
HCM Control Delay (s)	7.6	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

DKS

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INTERSECTION OPERATIONS

EXISTING PLUS PROJECT CONDITIONS WITH SIGNAL

INTERSECTION 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	0	10	8	0	18	22	955	29	41	671	33
Future Volume (veh/h)	32	0	10	8	0	18	22	955	29	41	671	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1900	1604	1767	1900	1707	1559	1796	1856	1856	1752	1366
Adj Flow Rate, veh/h	32	0	10	8	0	18	22	955	29	41	671	33
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	0	20	9	0	13	23	7	3	3	10	36
Cap, veh/h	34	0	71	13	0	41	27	1231	37	52	1194	59
Arrive On Green	0.03	0.00	0.04	0.01	0.00	0.03	0.02	0.71	0.71	0.03	0.72	0.72
Sat Flow, veh/h	1273	0	1610	1682	0	1610	1485	1734	53	1767	1656	81
Grp Volume(v), veh/h	32	0	10	8	0	18	22	0	984	41	0	704
Grp Sat Flow(s),veh/h/ln	1273	0	1610	1682	0	1610	1485	0	1787	1767	0	1737
Q Serve(g_s), s	2.5	0.0	0.6	0.5	0.0	1.1	1.5	0.0	35.6	2.3	0.0	19.0
Cycle Q Clear(g_c), s	2.5	0.0	0.6	0.5	0.0	1.1	1.5	0.0	35.6	2.3	0.0	19.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	34	0	71	13	0	41	27	0	1268	52	0	1252
V/C Ratio(X)	0.95	0.00	0.14	0.60	0.00	0.44	0.81	0.00	0.78	0.79	0.00	0.56
Avail Cap(c_a), veh/h	55	0	293	69	0	290	61	0	1268	76	0	1252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.6	0.0	46.0	49.4	0.0	48.0	48.9	0.0	9.4	48.2	0.0	6.6
Incr Delay (d2), s/veh	77.7	0.0	0.9	35.8	0.0	7.4	41.2	0.0	4.7	28.4	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.3	0.3	0.0	0.5	0.8	0.0	10.6	1.4	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	126.3	0.0	46.9	85.3	0.0	55.4	90.1	0.0	14.1	76.6	0.0	8.4
LnGrp LOS	F	A	D	F	A	E	F	A	B	E	A	A
Approach Vol, veh/h		42			26			1006			745	
Approach Delay, s/veh		107.4			64.6			15.7			12.1	
Approach LOS		F			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	76.9	6.3	8.4	7.3	78.0	8.2	6.5
Change Period (Y+Rc), s	5.5	5.9	5.5	4.0	5.5	5.9	5.5	4.0
Max Green Setting (Gmax), s	4.3	52.5	4.1	18.2	4.1	52.7	4.3	18.0
Max Q Clear Time (g_c+I1), s	4.3	37.6	2.5	2.6	3.5	21.0	4.5	3.1
Green Ext Time (p_c), s	0.0	5.9	0.0	0.0	0.0	4.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	3	10	26	0	47	3	690	5	52	788	11
Future Volume (veh/h)	28	3	10	26	0	47	3	690	5	52	788	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1900	1604	1826	1900	1870	1900	1885	1826	1826	1841	1085
Adj Flow Rate, veh/h	28	3	10	26	0	47	3	690	5	52	788	11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	0	20	5	0	2	0	1	5	5	4	55
Cap, veh/h	39	18	61	37	0	74	6	1236	9	66	1260	18
Arrive On Green	0.02	0.05	0.05	0.02	0.00	0.05	0.00	0.66	0.66	0.04	0.70	0.70
Sat Flow, veh/h	1753	385	1284	1739	0	1610	1810	1869	14	1739	1811	25
Grp Volume(v), veh/h	28	0	13	26	0	47	3	0	695	52	0	799
Grp Sat Flow(s),veh/h/ln	1753	0	1669	1739	0	1610	1810	0	1883	1739	0	1836
Q Serve(g_s), s	1.4	0.0	0.7	1.3	0.0	2.6	0.1	0.0	17.8	2.7	0.0	21.1
Cycle Q Clear(g_c), s	1.4	0.0	0.7	1.3	0.0	2.6	0.1	0.0	17.8	2.7	0.0	21.1
Prop In Lane	1.00		0.77	1.00		1.00	1.00		0.01	1.00		0.01
Lane Grp Cap(c), veh/h	39	0	79	37	0	74	6	0	1245	66	0	1278
V/C Ratio(X)	0.71	0.00	0.16	0.70	0.00	0.63	0.52	0.00	0.56	0.79	0.00	0.63
Avail Cap(c_a), veh/h	84	0	334	83	0	322	82	0	1245	102	0	1278
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.7	0.0	41.2	43.8	0.0	42.2	44.8	0.0	8.2	42.9	0.0	7.4
Incr Delay (d2), s/veh	21.2	0.0	1.0	21.5	0.0	8.5	56.7	0.0	1.8	19.6	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.3	0.8	0.0	1.2	0.2	0.0	5.5	1.4	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	0.0	42.1	65.3	0.0	50.7	101.5	0.0	10.0	62.6	0.0	9.7
LnGrp LOS	E	A	D	E	A	D	F	A	A	E	A	A
Approach Vol, veh/h		41			73			698			851	
Approach Delay, s/veh		57.7			55.9			10.4			12.9	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	65.4	7.4	8.3	5.8	68.5	7.5	8.2
Change Period (Y+Rc), s	5.5	5.9	5.5	4.0	5.5	5.9	5.5	4.0
Max Green Setting (Gmax), s	5.3	41.5	4.3	18.0	4.1	42.7	4.3	18.0
Max Q Clear Time (g_c+I1), s	4.7	19.8	3.3	2.7	2.1	23.1	3.4	4.6
Green Ext Time (p_c), s	0.0	4.1	0.0	0.0	0.0	4.9	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

APPENDIX D
VMT ANALYSIS

VMT ANALYSIS

DATE: December 9, 2021

TO: Matthew Ilagan, Pelle Clarke | City of Sacramento

FROM: Josh Pilachowski, David Tokarski, Jim Damkowitch | DKS Associates

SUBJECT: 8981 Osage Avenue Warehouse VMT Analysis Project #19179-015

In accordance with Senate Bill 743 (SB 743) and the resulting changes to the California Environmental Quality Act (CEQA) Guidelines published by the Natural Resources Agency, local agencies may no longer use measures of vehicle delay such as Level of Service (LOS) to quantify transportation impacts on the environment. VMT is a systemic metric and is a useful indicator of overall land use and transportation efficiency, where the most efficient system is one that minimizes VMT by encouraging shorter vehicle trip lengths, more walking and biking, or increased carpooling and transit. Vehicle miles traveled (VMT) has been codified in the CEQA Guidelines as the most appropriate measure for measuring transportation impacts under CEQA. This change went into effect statewide on July 1, 2020. The City of Sacramento's draft transportation impact guidelines are consistent with OPR's recommendation of using VMT as a metric.

Based on current practice of the City of Sacramento, transportation impacts are considered significant if the proposed project would result in a VMT per capita or office VMT per employee above 85% of the regional average, consistent with technical guidance published by the Governor's Office of Planning and Research (OPR). The OPR guidance does not specify a particular significance threshold for industrial employment and recommends that local jurisdictions determine this threshold based on local conditions. Some jurisdictions in the Sacramento region (including Sacramento County (adopted) and the City of Rancho Cordova (draft guidelines)) have determined that the significance threshold for industrial employment is 100% of regional average. The draft City of Sacramento Transportation Impact Analysis Guidelines do not specify a significance threshold for industrial land uses. For consistency purposes, this analysis applies the significance threshold of 100% of regional average for industrial uses.

The methodology in this analysis for evaluating VMT and completing an SB 743 compliant analysis of the proposed project in the City of Sacramento is described below.

VMT SCREENING

VMT SCREENING CRITERIA

Pursuant to SB 743 and technical guidance published by OPR, there are several screening procedures to potentially streamline project analysis (i.e., provide a presumptive non-impact finding and obviate the need for a VMT analysis). The various screening options are listed below with a brief determination of whether a given screen is triggered by the proposed project.

- Project Size: Projects that generate fewer than 110 trips per day can be presumed to have a less than significant transportation impact. Based on the trip generation data presented in the Focused Transportation Analysis (in a separate document prepared by DKS), the proposed project does not meet this screening criteria.
- Proximity to High Quality Transit: Residential or office projects within one-half mile of an existing major transit station or stop along an existing high-quality transit corridor can be presumed to have a less than significant transportation impact. The proposed project is not currently served by transit. The project does not meet this screening criteria.
- Affordable Housing Development: The proposed project does not include the provision of housing. The proposed project does not meet this screening criteria.
- Locally Serving Retail: Typically less than 50,000 square feet. The proposed project does not contain commercial square footage and thus does not meet this screening criteria.
- Infrastructure: Projects that would not likely lead to a substantial or measurable increase in vehicle travel are presumed to be VMT neutral and generally presumed to have a less than significant transportation impact (i.e., induced VMT). These include: Roadway Maintenance and Rehab Projects; Signal Timing / Synchronization / Adaptive Signal Control /Signal Preemption Improvements; Intersection Control Type and Turn Lane Channelization Improvements; Widening for Local or Local Collector Streets; and Transit / Bicycle / Pedestrian Infrastructure Improvements. The proposed project does not contain any substantial infrastructure improvements that meet this screening criteria.
- Project Location: Projects that fall within an identified location (in this case SACOG's hexagon methodology is used for screening purposes) that demonstrates VMT per Capita for residential projects below 85% of the regional average for that metric, or VMT per Employee for employment-based projects below 100% of the regional average for that metric. As illustrated in **Figure 1**, the project is in a hexagon with an estimated VMT of 95.1% of the regional average. Thus, the project meets this screening criteria.

VMT IMPACT AND MITIGATION

As the project meets the screening criteria based on VMT for employee, the impact is less-than-significant. No mitigation is required.

FIGURE 1: VMT EMPLOYMENT SCREENING MAP