TRAFFIC IMPACT ANALYSIS HANDBOOK

VOLUME I – METHODOLOGIES & REQUIREMENTS

2008

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Downtown panoramic photo provided by 1stACT Silicon Valley

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I. INTRODUCTION

PURPOSE OF THE TIA HANDBOOK

The primary purpose of this document is to provide a comprehensive guide in determining the appropriate methodology and process for preparing a transportation impact analysis (TIA) report and to provide a framework for all of the City's transportation policies. Traffic engineering and planning consultants shall use this document as a guide in preparing TIA reports that comply with the adopted transportation policies of the City of San José, as well as with those set forth by the Santa Clara County Congestion Management Program (CMP). This document will supersede any other document(s) with which it conflicts, including the CMP guidelines. Moreover, each TIA will be completed based on a project-specific work scope provided by City staff that will clarify any conflicts.

The preparation and review process conducted by the traffic consultant and the City, respectively, will be expedited when a TIA is completed in accordance with these guidelines. The goal of the consultant should be to prepare a high-quality document with the appropriate information set forth in the handbook. While the study preparers and reviewers will sometimes have different objectives and perspectives, all parties involved in the process should adhere to established engineering ethics and conduct all analyses and reviews objectively and professionally.

BACKGROUND

The City of San José established a set of TIA guidelines in June 1994 titled Interim Guidelines for Traffic Impact Analysis of Land Developments to provide a format for developers, traffic engineering consultants, and the general public to follow. These guidelines provided a basis to determine the need for a TIA and the scope and steps required to complete one. This document incorporates new and updated policies and guidelines governing traffic impact analysis of development projects. This document provides some of the same information as the 1994 version but expands upon it and formalizes the requirements.

CALIFORNIA ENVIROMENTAL QUALITY ACT (CEQA)

An environmental review of a proposed project is needed to satisfy California Environmental Quality Act (CEQA) requirements. The TIA is part of this process and must meet the requirements of CEQA. A project will be issued one of the following CEQA designations depending upon the size, complexity, and project impacts:

Categorical Exemption (CE)

Any project is exempt under CEQA that would clearly not have a significant effect on the environment or is exempt by state legislation. A TIA is usually not required for projects of this designation.

Negative Declaration/Mitigated Negative Declaration (ND/MND)

A negative declaration can be prepared for a project if there is no substantial evidence that the project may have a significant effect on the environment or if the project will mitigate any potentially significant effects to a less than significant level.

Environmental Impact Report (EIR)

An EIR shall be prepared when it is determined that substantial evidence indicates that a project may have a significant effect on the environment.

Typically, the TIA helps to determine the CEQA designation during the environmental review process. The conclusions from the TIA are the basis for determining the project's transportation impact and identifying necessary mitigation measures. A TIA should, therefore, provide sufficient information to properly evaluate the impacts and required project mitigation. A TIA may also be required for planning permits such as zoning/rezoning, planned development, conditional use, tentative map, or site development permits.

ORGANIZATION OF THE HANDBOOK

This handbook includes numerous City's policies, guidelines, and methodologies that govern traffic impact analyses for development projects. For ease of reference and comprehension, this handbook is presented in two volumes. Volume I, subtitled *Methodologies and Requirements*, consolidates all relevant policies and guidelines into a quick reference guide book. It also defines and describes specific study requirements, such as study scenarios and LOS methodology. The requirements and procedures of the Congestion Management Program (CMP) are also discussed in Volume I.

Volume II of this handbook is subtitled *Policies and Procedures*. Volume II is a collection of all relevant City's policies and guidelines in their entirety for reference or research.

Both volumes of this handbook will be revised and amended as necessary. Users of this handbook should verify with San José City Department of Transportation or Department of Public Works for the latest edition.

II. POLICIES AND GUIDELINES

GENERAL PLAN

General Plan Goals

The General Plan states a goal of minimum overall performance of City streets during peak travel periods of Levels of Service "D." This goal must be balanced with the City's land use strategies to create and maintain the livable community San José envisions. The following General Plan Goals must be considered concurrently to maintain the overall vision for San José:

- Create a balanced and multi-modal transportation system that accommodates vehicular, pedestrian, bicycle, and transit facilities
- Review development proposals for their measurable impacts and provide appropriate mitigation
- Develop "Area Development Policies" to modify the Levels of Service standards to accomplish the land use goals of the General Plan
- Promote infill development
- Promote Downtown Development

General Plan Policies

The transportation needs of the City of San José associated with both new development and redevelopment should be met through the implementation of transportation policies which foster safe and efficient movement for travel and delivery of goods. The transportation policies contained in the City's General Plan describe how these objectives should be met through the improvement of both the roadway system as well as the various modes of transportation available to the City's residents.

Specific multi-modal transportation policies that are contained in the City's adopted General Plan, or have otherwise been formally adopted by the City Council include the following:

- Pedestrians: General Plan policies encourage pedestrian travel between high-density residential and commercial areas throughout the City. Pedestrian access is particularly encouraged for facilities such as schools, parks and transit stations, and in neighborhood business districts. [General Plan Transportation Policy 17]
- Bicycles: General Plan policies encourage a safe, direct and well-maintained bicycle network that links residences with employment centers, schools, parks, and transit facilities. Bicycle lanes are considered appropriate on arterials and major collectors. Bicycle safety is to be considered in any improvement to the roadway system undertaken for traffic operations purposes. [General Plan Transportation Policies 51, 52, and 56]
- Neighborhood Streets: General Plan policies discourage inter-neighborhood movement of people and goods on neighborhood streets. Streets are to be designed for vehicular, bicycle and pedestrian safety. Neighborhood streets should discourage both through vehicular traffic and unsafe speeds. [General Plan Transportation Policies 1, 8 and 9]

- Private Developments: When a Transportation Impact Analysis finds that a proposed development project would create an adverse traffic condition within an existing neighborhood, the City's Department of Transportation, other City staff, and the developer's consultants will work to ensure that the development will include appropriate measures, including traffic calming measures where appropriate, to minimize the adverse impacts to the neighborhood.
- New Development: New development should create a pedestrian-friendly environment that is safe, convenient, pleasant, and accessible to people with disabilities. Connections should be made between the new development and adjoining neighborhoods, transit access points, community facilities, and nearby commercial areas. [Council Policy 5-6: Traffic Calming adopted 4/25/00 and revised 6/26/01]
- Transit Facilities: General Plan policies state that all segments of the City's population are to be provided access to transit. Public transit systems should be designed to be attractive, convenient, dependable, and safe. [General Plan Transportation Policy 11]
- Vehicular Traffic: The General Plan provides that the minimum overall performance of signalized intersections within the City should be correlated to a minimum Levels of Service. A development that would cause the performance of an intersection to fall below the minimum Levels of Service needs to provide vehicular related improvements aimed at maintaining the minimum Levels of Service. If necessary to reinforce neighborhood preservation objectives and meet other General Plan policies, the Council may adopt a policy to establish alternative mitigation measures. [General Plan LOS Policy 5]
- Regional Freeways: General Plan policies encourage the City's continued participation in inter-jurisdictional efforts, such as the Santa Clara County Congestion Management Agency (CMA), to develop and implement appropriate techniques to improve the regional transportation system. [General Plan Transportation Policy 29]

CITY TRANSPORTATION IMPACT POLICY

The San José City Council adopted the City Transportation Impact Policy on June 21, 2005 (Resolution 72765.1). This policy repeals and replaces previously adopted Council Policies 5-3, "Transportation Level of Service" and 5-4, "Alternate Traffic Mitigation Measures."

The purpose of this Policy is to guide analyses and determinations regarding the overall conformance of a proposed development with the City's various General Plan multi-modal transportation policies, which together seek to provide a safe, efficient, and environmentally sensitive transportation system for the movement of people and goods.

Traffic Level of Service

Level of Service is a measure of traffic congestion at signalized intersections. The standards used by the City of San José to measure the Level of Service within the areas subject to this policy are described in the following table.

Table 1 - Levels of Service

A	Operations with very low delay occurring with favorable progression and/or short cycle length.
B	Operations with low delay occurring with good progression and/or short cycle lengths.
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

The City's goal is to achieve an overall Level of Service of "D" at signalized intersections unless governed by an Area Development Policy or protected intersection designation. City staff shall determine the appropriate methodology for determining the Level of Service, and shall apply that methodology in a consistent manner.

Policy Implementation

Exempted Development Land Uses

The City Transportation Impact Policy applies to all developments within the applicable geographic areas, except the following types of infill projects that shall be exempted from this Policy, because the Council finds that these projects, individually and cumulatively, will not cause a significant degradation of transportation Level of Service and the subject projects will further other City goals and policies:

a. All retail commercial buildings containing 5,000 square feet of gross area or less.

b. All office buildings containing 10,000 square feet of gross area or less.

c. All industrial buildings of 30,000 square feet or less.

d. All single-family detached residential projects of 15 dwelling units or less.

e. All single-family attached or multi-family residential projects of 25 units or less.

In no case shall any of these above types of infill projects be exempted if they are increments of a larger project or parcels.

Significant LOS Impacts

A significant LOS impact occurs when the TIA demonstrates that the proposed development would cause the Levels of Service at an intersection to fall below LOS D with the addition of project traffic to baseline conditions. For intersections already operating at unacceptable LOS (E or F) under the baseline condition, a significant impact is defined as the proposed project causing:

1. An increase in average critical delay value by 4.0 seconds or more and an increase in the critical V/C ratio of 0.010 or more, or

2. A decrease in average critical delay and an increase in the critical V/C ratio of 0.010 or more.

When a significant impact occurs, the TIA must also identify improvements that would reduce traffic congestion so that the intersection operates at the level that would occur without the proposed project.

Mitigation for LOS Impacts

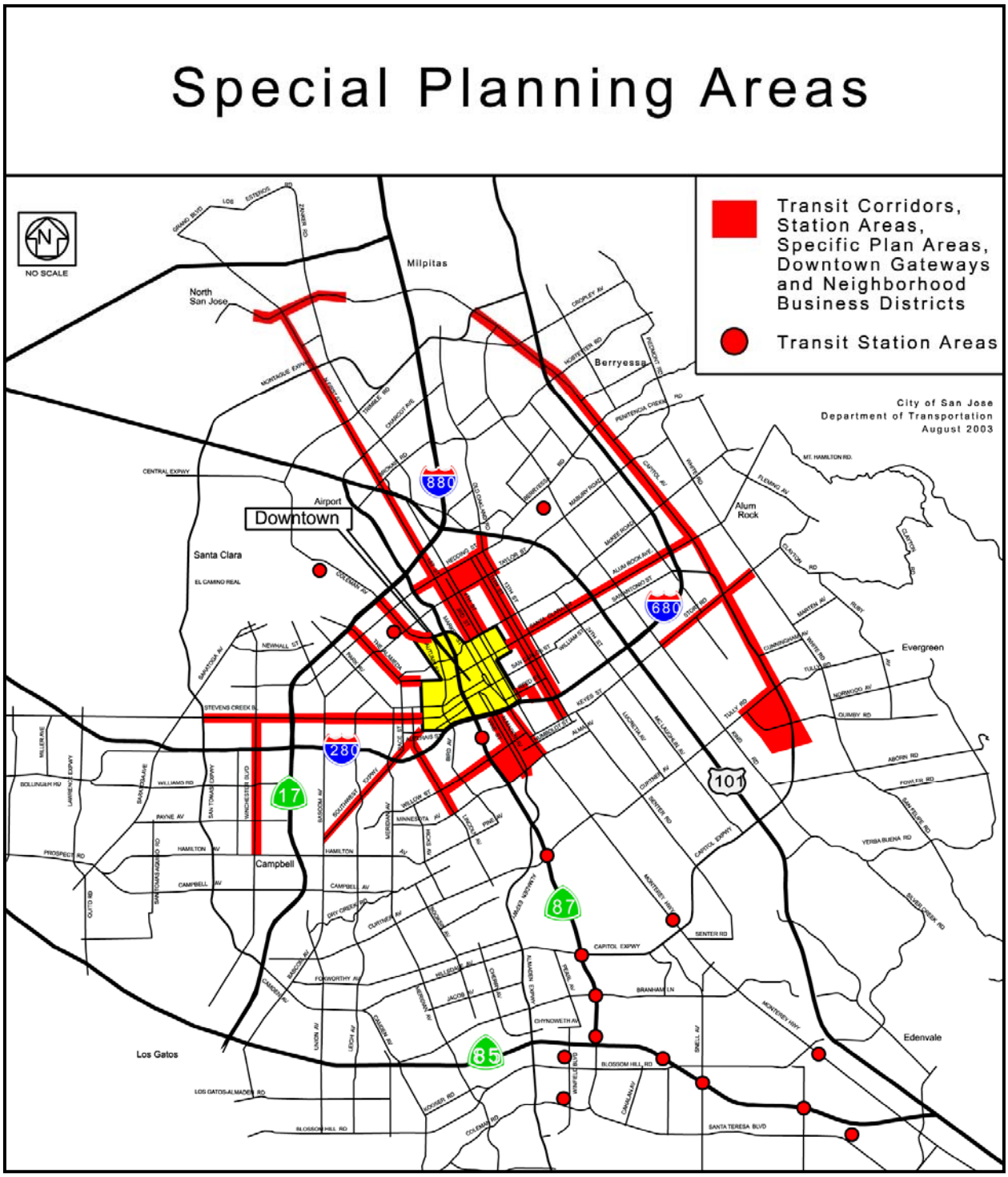
The proposed development is required to construct all LOS Traffic Improvements identified in the TIA as necessary to mitigate the significant LOS impacts, unless the TIA demonstrates that these improvements would have an unacceptable impact on other transportation facilities (such as pedestrian, bicycle, and transit systems and facilities). An improvement has an unacceptable secondary impact if the TIA demonstrates that the improvement would result in a physical reduction in the capacity and/or a substantial deterioration in the quality (aesthetic or otherwise) of any other planned or existing transportation facilities. The following are examples of the kinds of secondary impacts that would be considered unacceptable:

- Reducing the width of a sidewalk below minimum city standard
- Eliminating a bicycle lane or reducing its width below city standard
- Eliminating a bus stop or eliminating a parking lane that accommodates a bus stop
- Eliminating a park strip (landscaped area between sidewalk and street) that contains mature trees
- Encouraging substantial neighborhood cut-through traffic
- Creating unsafe pedestrian and/or automobile operating conditions

Protected Intersections

The City of San José has identified certain local intersections for which no further vehicle capacity improvements are planned. These intersections are built to their maximum capacity, where further expansion would cause significant adverse effects upon existing or approved transit or other multimodal facilities, nearby land uses, or local neighborhoods. Future infill development that is otherwise consistent with other General Plan policies encouraging Smart Growth may, therefore, generate additional traffic through these intersections, resulting in a level of congestion that would not otherwise be consistent with the rest of the City Transportation Impact Policy. A current list of Protected Intersections is included in Appendix A.

Figure 1 - Special Planning Areas



Any intersection that is added to the List of Protected Intersections must be within designated Special Planning Areas as shown on Figure 1 on page 7 and consistent with the General Plan. The process of adding to the List of Protected Intersections can be found in detail in Volume II.

If a proposed development project will cause a significant LOS impact at one or more of these Protected Intersections, the proposed development will be required to construct specific improvements to other segments of the citywide transportation system to improve overall person-trip capacity and/or enhance non-auto travel modes. First priority for such improvements will be those improvements that would be proximate to the neighborhoods impacted by the development project traffic. The process for identifying and approving these improvements is described in Appendix A of the City Transportation Impact Policy. The threshold of significance for protected intersections is one-half that of non-protected intersections. By funding these improvements to the City's overall multi-modal transportation system, the development project will contribute substantially to achieving General Plan goals for improving and expanding the City's multi-modal transportation system. The development project would, therefore, be consistent with the City's General Plan multi-modal Transportation Policies, including the Traffic Level of Service Policy.

AREA DEVELOPMENT POLICIES

Area Development Policies Summary

Currently, there are five Area Development Policies and one Deficiency Plan:

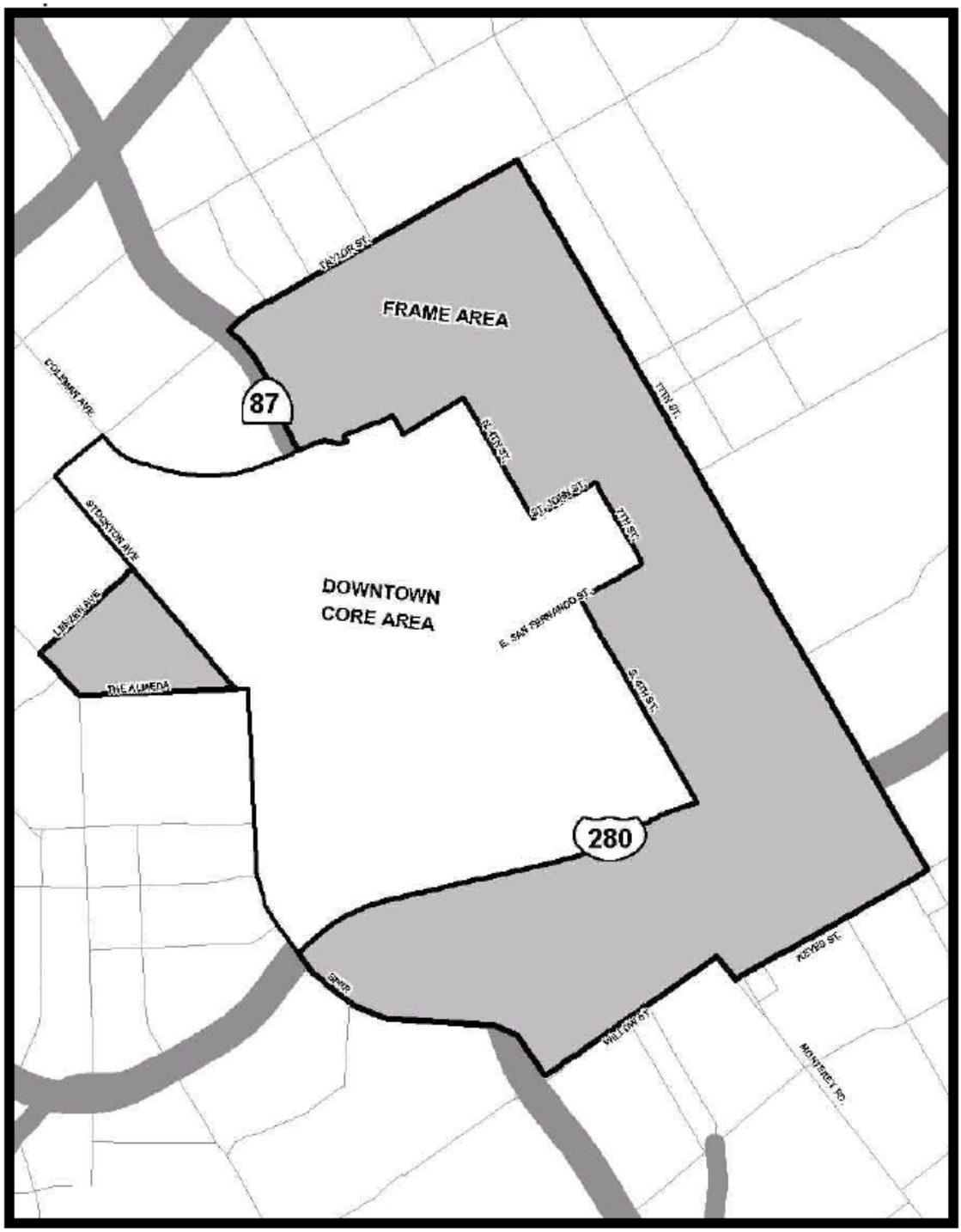
- Downtown Core General Plan Policy
- Edenvale Area Development Policy
- Evergreen Area Development Policy
- North San José Area Development Policy
- North San José Deficiency Plan
- US-101/Oakland/Mabury Transportation Development Policy

These policies and plan are briefly described in this report and supersede the City Transportation Impact Policy within their respective areas. As TIA work scopes are prepared, staff will provide necessary information to meet the specific requirements of these area policies. However, the traffic consultant should be familiar with the provisions and technical approach used in each area. Full versions of these Area Development Policies and Deficiency Plan are included in Volume II.

Downtown Area General Plan Policy

In recognition of the unique position of the Downtown Core Area as the transit hub of Santa Clara County, and as the center for financial, business, institutional, and cultural activities, development within the Downtown Core Area Boundary is exempted from traffic mitigation requirements. Intersections within and on the boundary of this area are also exempted from the Level of Service "D" performance criterion. Figure on page 9 presents the Downtown Core Area geographical boundaries.

Figure 2 - Downtown Core General Plan Policy Boundaries



Source: Department of Planning, Building and Code Enforcement

Edenvale Area Development Policy

The City of San José has adopted an Area Development Policy for the Edenvale Redevelopment Area in conformance with the provisions of General Plan Level of Service Policy #5. The primary objectives for adoption of this Area Development Policy are to:

- Manage the traffic congestion associated with near-term development in the Edenvale Redevelopment Area
- Promote General Plan goals for economic development and particularly high technology driving industries
- Encourage a citywide reverse commute to jobs at southerly locations in San José, and
- Provide for transit-oriented, mixed-use residential and commercial development to increase internalization of automobile trips and promote transit ridership

This Area Development Policy addresses development anticipated in Edenvale on both sides of U.S. Highway 101 in the next five to ten years. See Figure 3 on page 11 for locations of Edenvale Area boundaries. On the east side of U.S.101 is that portion of the Edenvale Redevelopment Area known as New Edenvale. The total amount of additional development allowed to occur in this area is 5 million square feet of additional industrial floor space from the date of the Policy's original approval.

Southwest of U.S. 101 is the remainder of the Edenvale Redevelopment Area commonly known as Old Edenvale. Within this broader Redevelopment Area and to the north of State Route 85, mixed-use residential and commercial development is proposed to occur on the Hitachi campus plus the residual portion of the IBM campus, in addition to existing entitlements of industrial development. Development in this area will be up to a maximum of 3.6 million square feet of R&D industrial/office, 682,000 square feet of commercial uses, and 2,930 attached dwelling units.

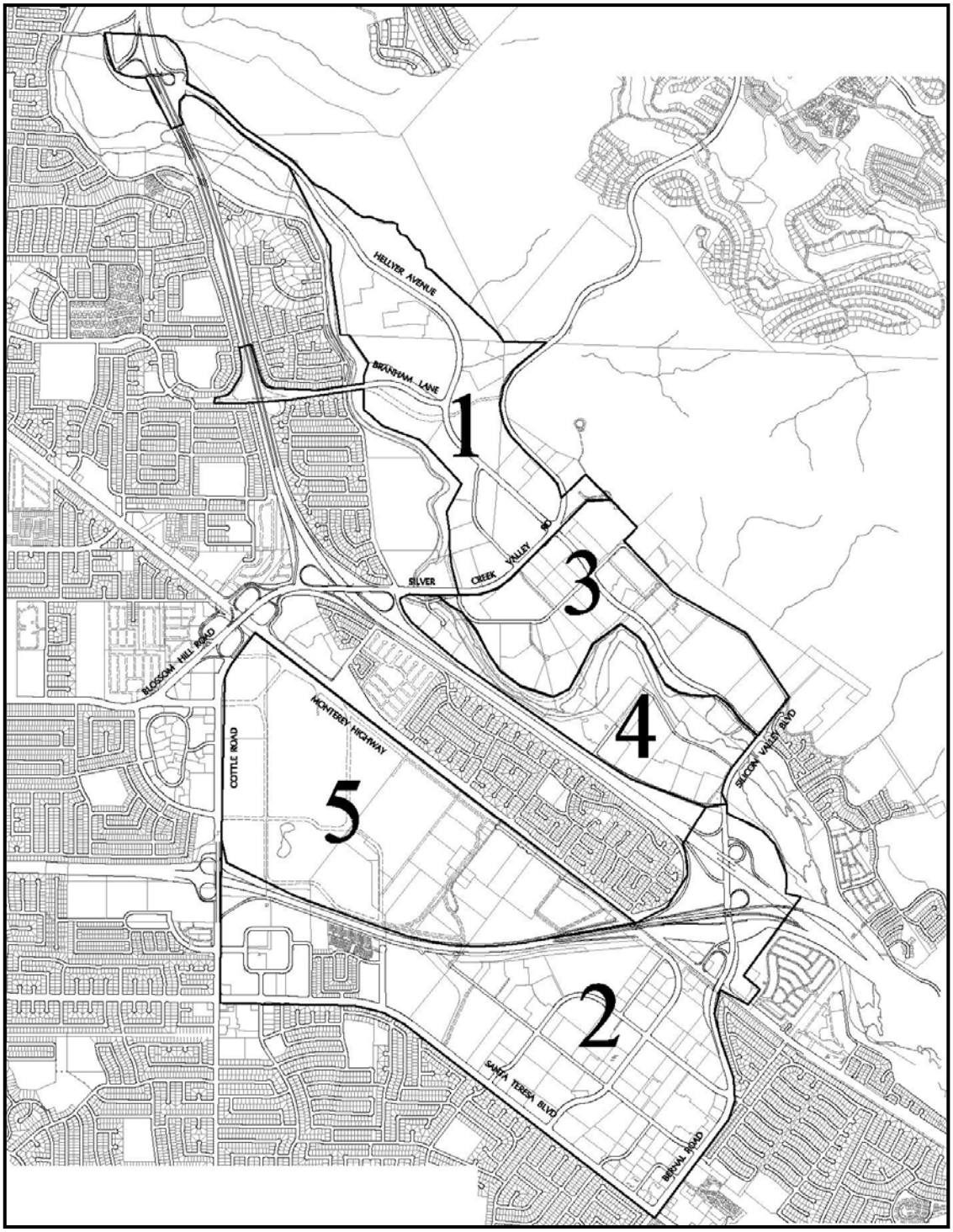
This Policy requires specific infrastructure improvements be constructed at specific levels of development, and describes how and when the infrastructure will be constructed. The policy will allow the Level of Service of some nearby intersections to temporarily deteriorate to levels in excess of the City's Transportation Level of Service Policy. The length of time traffic will operate below the standards of the citywide policy will depend on the rate at which industrial projects are developed, and the timing required for regional infrastructure improvements to be designed and constructed.

Evergreen Area Development Policy

The primary purpose of the Evergreen Development Policy (EDP) is to provide a comprehensive policy framework for new development within the Evergreen area. The EDP links together new development with the provision of new infrastructure and amenities.

The Evergreen Development Policy, consistent with the provisions of General Plan Level of Service Policy #5, provides alternative standards for determining conformance with the City's Transportation Impact Policy for transportation facilities. The primary reason for adopting an Area Development Policy is to manage the traffic congestion associated with near term development in the Evergreen area and simultaneously promote development consistent with the General Plan goals and neighborhood visions.

Figure 3 - Edenvale Area Development Policy Boundaries



The Evergreen Development Policy Area is bounded by Story Road to the north, US 101 to the west, Hellyer Avenue to the south, and City's Urban Service Area Boundary to the east (see Figure 4 on page 13). A Benefit Assessment District was formed to fund transportation improvements that allow 4,759 residential units to be constructed. These units are presumed to be approved projects for transportation impact analysis purposes. Any project not included in the Benefit Assessment District must conduct a transportation impact analysis and mitigate their impacts. An impact requiring mitigation is defined as:

1. An increase in traffic from any project causing a Levels of Service to change; or

2. The addition of any residential project traffic to an intersection operating at LOS E or F

3. The addition of non-residential project traffic that causes an increase in critical traffic movement by more than a one-half percent (0.5 %) at an intersection operating at LOS E or F.

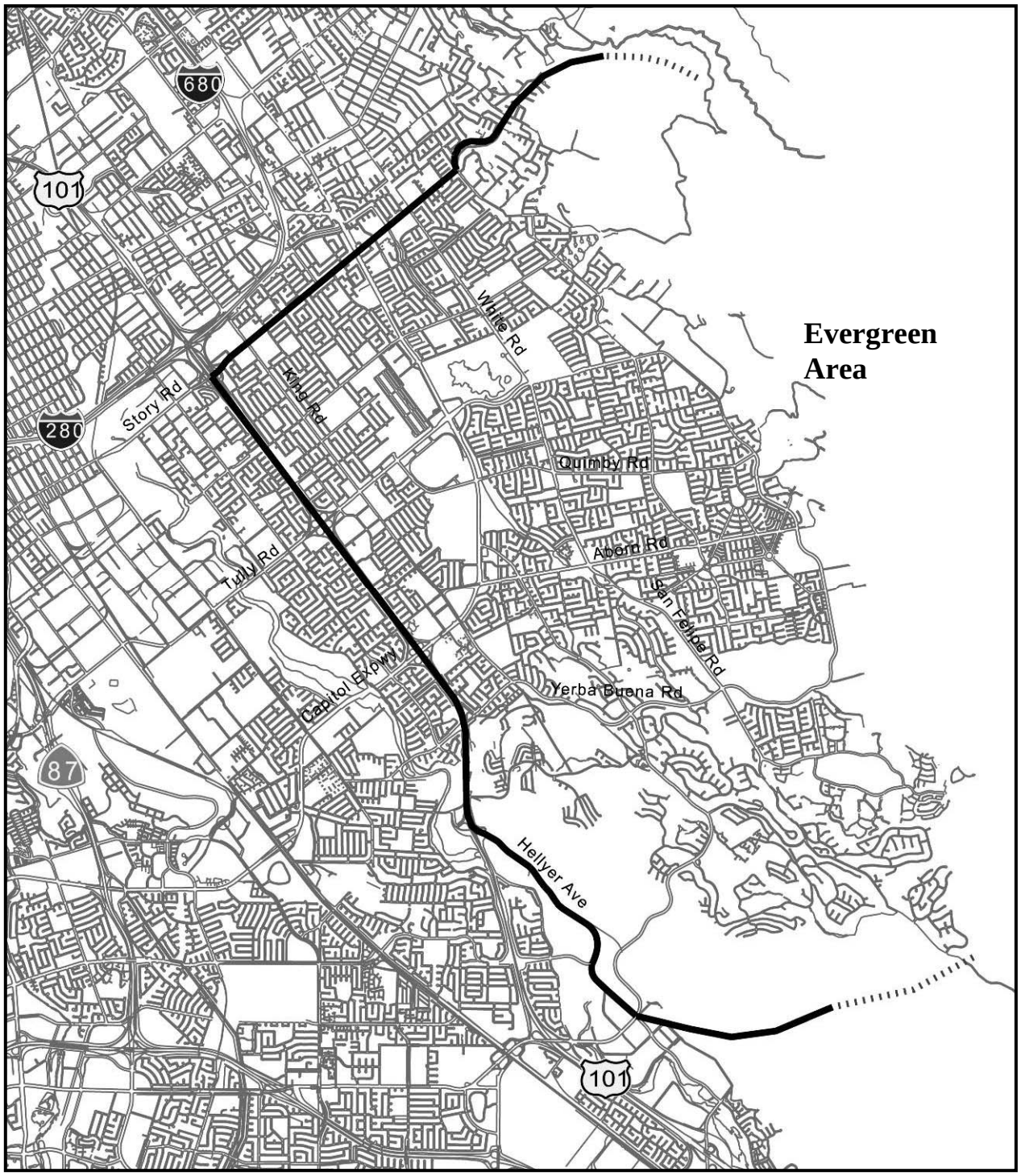
The programmed improvements as well as the estimated number of trips for the 4,759 residential units are included in the baseline scenario (Background Conditions) section of the TIA. If modifications to the allowance of the number of units allocated to the Benefit Assessment District is requested, the analysis must include these additional units under project conditions and identify any impacts associated with these additional units. All projects analyzed within the Evergreen Area are responsible for mitigating all impacts associated with the proposed project.

North San José Area Development Policy

The North San José (NSJ) Policy area boundaries generally match the boundaries of the Rincon de Los Esteros Redevelopment Area (see Figure 5 on page 15), including the area within San José north and west of Interstate 880 or the Coyote Creek, east of the Guadalupe River and south of State Route 237. The Policy area also includes an area east of Interstate 880 along Murphy Avenue as far as Lundy Avenue. The Policy was revised in 2005 to address the potential impacts of developing an additional 26.7 million square feet of industrial use, 1.7 million square feet of supporting commercial use, and 32,000 residential units within the Policy area.

The specific traffic impacts of this amount of new development have been analyzed and described in the traffic analysis and Environmental Impact Report (EIR) prepared for the Policy. The Policy also includes mitigation measures identified for these impacts and establishes a mechanism for the implementation of these mitigation measures. Typically, any new development in the area that falls within the parameters of the Policy should not require additional review of traffic impacts, but may require additional analysis to address site operational issues. To be consistent with the traffic analysis included within the EIR, new projects must include design features and programs that support multi-modal commute choices including provision of bicycle and pedestrian facilities and incorporation of transportation demand management (TDM) measures.

Figure 4 - Evergreen Area Development Policy Boundaries



Traffic Impact Fee

The City will collect a Traffic Impact Fee (TIF) to fund mitigation measures needed to accommodate future traffic conditions resulting from implementation of the NSJ Policy as described in the traffic analysis and EIR. The TIF will be assessed on all new residential and industrial development within the Policy area and shall be collected at issuance of Building Permits. Fees will only be levied for new development beyond existing development rights.

The TIF equitably distributes the cost of the necessary infrastructure improvements on a cost per trip generated basis amongst the total development addressed through this Policy (e.g., 26.7 million square feet of office/industrial/ supporting retail development and 32,000 residential units). The fee initially was set at $10.44 per square foot for all new industrial/office/R&D development, at $6,994 per unit for new single-family residences, and at $5,596 per unit for new multi-family residences. These fees are adjusted automatically every two years according to the policy and should be reviewed every five years to account for changes in construction costs and/or inflation.

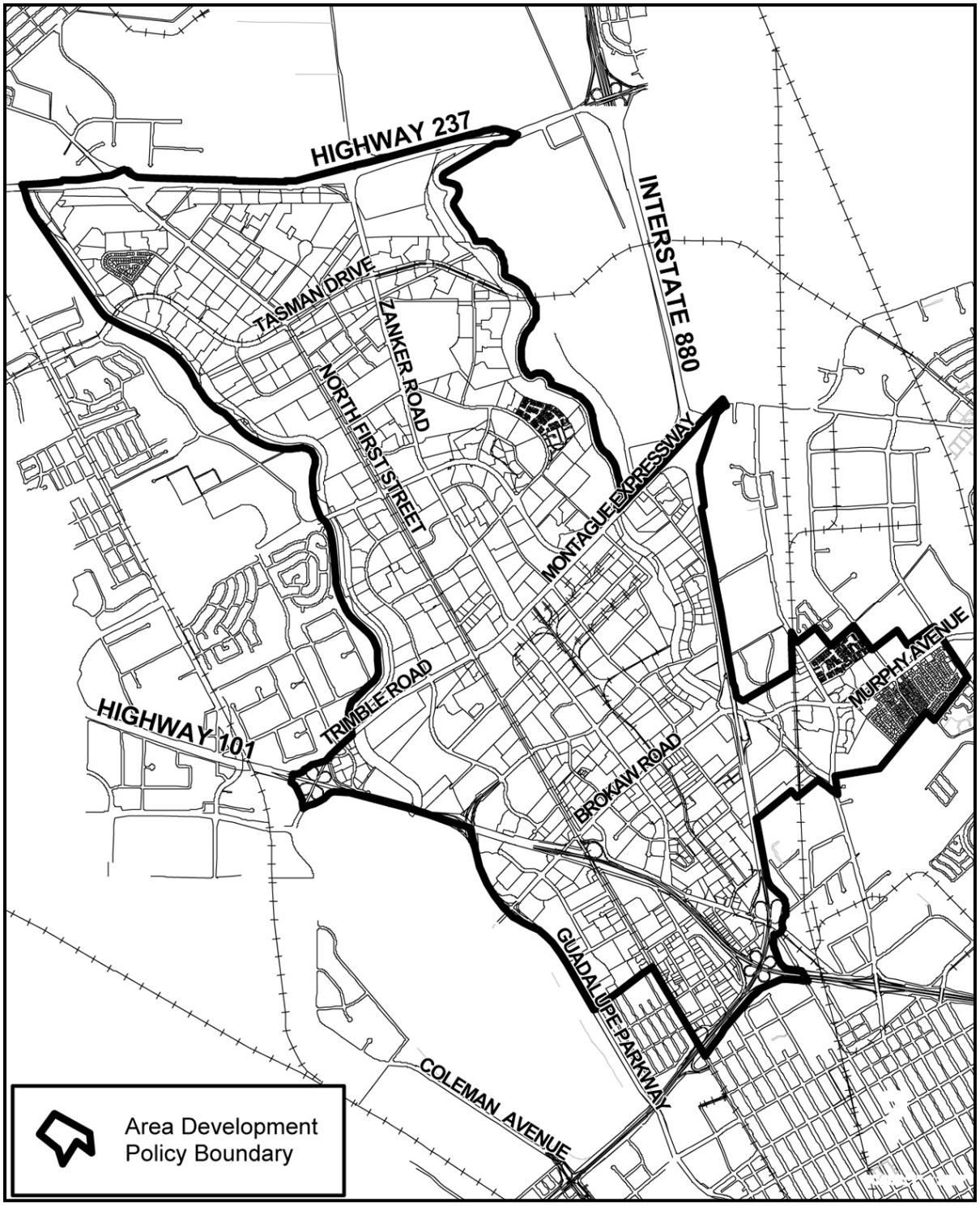
North San José Deficiency Plan

The North San José Deficiency Plan (NSJDP) report sets forth a plan to address existing and anticipated deficiencies in the Levels of Service (LOS) of intersections in North San José that are identified as part of the Santa Clara County Congestion Management Program (CMP). The deficiencies are projected to occur with the proposed intensification of future development within the North San José area. The objective of the NSJDP is to identify and implement a set of measures that will improve transportation conditions and air quality in North San José. Further, it is the objective of the NSJDP to set forth a comprehensive solution to LOS deficiencies at CMP intersections in North San José to avoid the need for adherence to strict standards at CMP intersections for which no localized mitigation is feasible.

Nine of the 12 CMP intersections that are the subject of this Deficiency Plan are currently operating within the CMP LOS standard but all are expected to degrade to LOS F at sometime in the future. The City has identified improvements for five of these intersections that will improve the Levels of Service at the intersections to LOS E or better, which meets CMP standards. Improvements for six other intersections have been identified that will improve intersection operations but not enough to meet the CMP LOS standard. The remaining intersection has been studied to identify possible improvements, but the City has determined that the improvements required to meet the LOS standard are not feasible.

Twelve of the 22 CMP designated intersections located within North San José are projected to operate at LOS F or worse under future conditions. Improvements have been identified for 11 of the 12 intersections as part of the Deficiency Plan. The proposed improvements would greatly enhance circulation within and to North San José. Nevertheless, 8 CMP intersections within North San José will continue to operate at unacceptable levels. The deterioration of the identified intersections is projected to occur regardless of the planned development levels of the NSJDP. The proposed improvements will serve to support the future traffic to the maximum extent feasible. In addition to those improvements described for CMP intersections, improvements to other intersections are proposed to further improve the overall levels of service on the North San José transportation system.

Figure 5 - North San Jose Area Development Policy Boundaries



The planned growth within the North San José area requires that the already extensive transit system within the North San José area be enhanced. The proposed high-density transit oriented development plan characterized by mixed land uses and high-rise buildings along the North First Street creates opportunities for high transit demand along with the need to implement pedestrian and bicycle facility improvements to reduce auto travel. The City will work with VTA as the North San José area develops to find a mutually agreeable process to implement transit improvements. Planned transit/bicycle/pedestrian improvements such as shelters, lighting, and crosswalk improvements are identified to improve non-automobile circulation. Additionally, trip reduction measures from the VTA's Immediate Implementation Action List will be implemented by the City. The actions will serve to offset the effects of vehicle operating deficiencies in the CMP transportation system anticipated by this plan.

US-101/Oakland/Mabury Transportation Development Policy

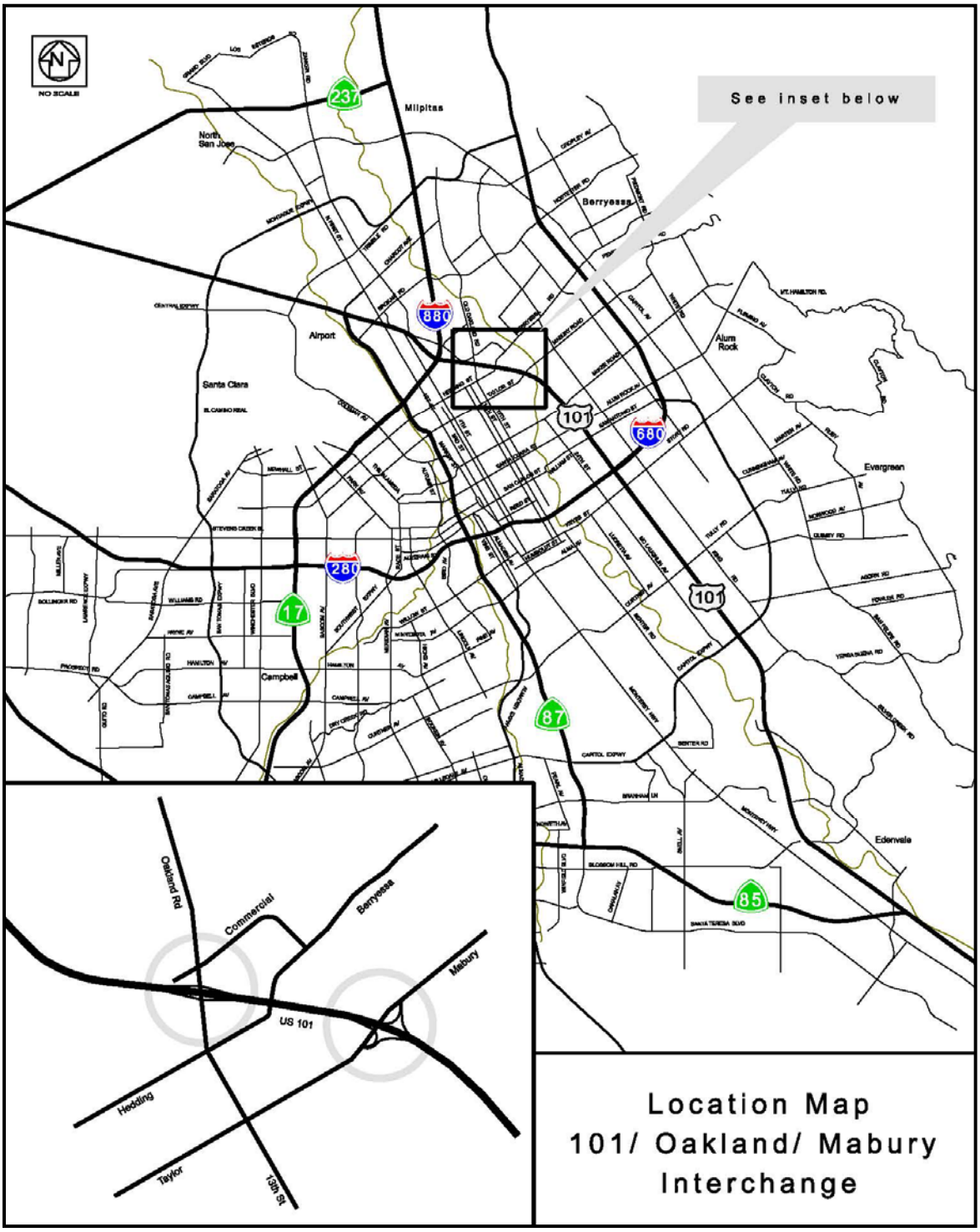
The City of San José adopted a Transportation Development Policy in conformance with and in furtherance of the provisions of the General Plan LOS Policy #5 for Traffic. This Transportation Development Policy is intended to manage traffic congestion associated with near-term new development in the US-101 corridor near the US-101/Oakland interchange, to promote General Plan goals for economic development and housing, and to support improvement of the US-101/Oakland Road interchange and construction of the new US-101/Mabury Road interchange to accommodate new development in the corridor.

The Policy identifies the reconstruction of US-101/Oakland Road interchange and the construction of US-101/Mabury Road interchange as the required infrastructure improvements to accommodate future growth in the corridor. In combination, both improvements will create 1,153 new interchange trips to accommodate future traffic growth ultimately, by allowing temporary non-conformance to General Plan LOS Policy in the corridor. Once constructed, the required improvements are expected to alleviate congestion around the US-101/Oakland Road interchange in the long run and maintain LOS consistent with General Plan LOS Policy in the corridor.

The Transportation Development Policy has no specific boundary and applies to all new development projects generating vehicular trips for the US-101/Oakland Road interchange, or the US-101/Mabury Road interchange upon construction. To ensure the construction of the required infrastructure improvements, one of the key provisions of the Policy is to establish a traffic impact fee program. The traffic impact fee program requires fair share financial contribution from new development in the corridor toward the overall cost of improvements in additions to other funding sources already identified. The impact fee of a development is based on the number of interchange trips generated by that project as determined in the traffic impact analysis of that project. The impact fee per interchange trip is $30,000 in 2008 and is adjusted annually thereafter per the Construction Cost Index published by the Engineering News Record (ENR).

In additions, this Policy establishes an exemption of up to 115 trips for future industrial developments from the traffic impact fee requirement to promote the General Plan Economic Development Major Strategy, the Industrial Land Use goal and policies, and to help improve the jobs/housing balance in the City. In the situation once the exemption is exhausted, new trips from industrial development will be required to pay the traffic impact fee as required for other types of development.

Figure 6 – US-101/Oakland/Mabury Transportation Development Policy Location



CITY GUIDELINES

Long-Term General Plan Amendment (GPA) Analysis

The City uses a traffic forecasting model to help determine the general adequacy of its planned transportation system relative to the demands of its own existing and planned land uses; it identifies long term constraints both internally and at the interfaces with other jurisdictions and with the regional transportation system; and it allows decision makers to evaluate the comparative traffic effects of land use changes over time.

The City of San José's traffic forecasting model was developed to help the City project peak hour traffic impacts attributable to changes proposed to the City's General Plan. The model is implemented using the CUBE transportation planning software system and is consistent with the structures of the Metropolitan Transportation Commission's (MTC) BAYCAST regional model and VTA's VTP2030 model. The San José model includes the four elements traditionally associated with models of this kind. These elements include trip generation, trip distribution, mode choice, and traffic assignment.

The long-term GPA analysis includes the following four types of analyses: proximity, screenline, cordon, and system. All analyses prepared for a GPA will be done for both AM peak hour and PM peak hour. In addition to providing projected peak hour and peak period volumes and ratios comparing projected traffic volume to available roadway capacity (V/C ratios) on each roadway segment, the model provides information on vehicle-miles and vehicle-hours of travel by facility type (freeway, expressways, arterial streets, etc.). These informational reports can be used to compare projected conditions under the current General Plan with the impacts of proposed land use amendments.

City staff will perform the model runs and provide model data to the preparer. The preparer is expected to complete the GPA analysis to determine what impacts the GPA will have on the transportation system. Refer to the City's *Methodology For Transportation Network Modeling and Analysis (CUBE Methodology)* for detailed description of impact thresholds.

Cumulative Intersection Analysis

The need to conduct a cumulative analysis is typically based on the required level of environmental documentation, and the approach to the analysis can vary depending on the size of the proposed development. A "Cumulative Traffic Impact Analysis Guidelines" was issued in May, 2006, to prescribe the city's two-tier approach to evaluating cumulative traffic operations that will help satisfy the requirements of cumulative traffic impact analysis. Specifically, the Guidelines defines a set of criteria to determine whether a project will result in a cumulative traffic impact according to the General Plan Policies and Goals, and City's Transportation Impact Policy. If a project results in a significant cumulative impact, the Guidelines further defines criteria to determine whether the impact is cumulatively considerable.

The process to determine cumulative impacts and the need for an EIR is described in following steps:

- A cumulative condition analysis is composed of addition of traffic from pending projects (or application of a growth factor) plus project-generated traffic over the background condition. The cumulative impact at an intersection is identified by comparing the cumulative conditions against the background conditions.

- A cumulative transportation impact at an intersection is identified based on the City's Levels of Service impact criteria as in project-level impact analysis. The criteria include degradation in Levels of Service from an acceptable level, or exacerbation of unacceptable operations based on changes in delay and critical movement volume.
- A project's contribution to a cumulative impact is deemed considerable if the proportion of project traffic represents 25% or more of the increase in total volume from Background to Cumulative Conditions.
- For cumulatively considerable impacts, mitigation measures should be identified to reduce the impact to a less than significant level. A fair-share financial contribution towards an improvement to mitigate a cumulative impact is accepted as sufficient to address the cumulative impact provided an additional funding source is identified or the identified improvement is ultimately incorporated into the City's CIP. The amount of the financial contribution will be equal to the proportion of project-generated traffic calculated above, with a maximum contribution of $2,000 per net new project generated trip escalated by 3.5% per year to account for inflation.

If no feasible mitigation can be identified to reduce the cumulatively considerable impacts to a less than significant level, then preparation of an EIR shall be required.

Cumulative Freeway Analysis

Freeways are State facilities and are monitored for operational efficiency by the County's Congestion Management Agency – The Valley Transportation Authority in the Santa Clara County. The City, as a member of the Congestion Management Agency, follows the methodologies established in VTA's guidelines for freeway impact analysis. On cumulative freeway analysis, VTA's guidelines do not establish a standard, but accept different methodologies already practiced by members. The City's Cumulative Freeway Impact Analysis Guidelines present a standard methodology for cumulative freeway analysis for development project review.

The City uses a traffic forecasting model to generate cumulative freeway segment volumes. To represent the cumulative traffic conditions, the input to the City's model includes the entire General Plan's land use development and transportation network. Model generated freeway volumes, both AM and PM peak commute hours, are reviewed and adjusted against the freeway volumes in the latest edition of CMP Monitoring and Conformance Report. The cumulative freeway analysis does not involve analysis for ramps or ramp junctions.

The cumulative freeway analysis evaluates volume-to-capacity (V/C) ratios of individual freeway segments, as opposed to densities in existing conditions and project conditions. A V/C ratio of value 1.0 corresponds to LOS E by definition. A cumulative freeway impact is determined if a freeway segment has a V/C ration greater under the cumulative conditions, and has a V/C ratio less than or equal to 1.0 under existing conditions. For freeway segments with V/C ratios greater than 1.0, the segments are said to have cumulative freeway impact if the increase of volumes from existing conditions to cumulative conditions is greater than 1 percent of capacity.

Ramp Impact Analysis

The City's is currently developing the procedures and criteria for freeway ramp impact analysis. A description will be included in this sub-section after formal implementation of the ramp analysis procedures.

CONGESTION MANAGEMENT PROGRAM

Congestion Management Agency Guidelines

The Santa Clara Valley Transportation Authority (VTA) is the Congestion Management Agency (CMA) for Santa Clara County. The VTA maintains TIA guidelines that provide a uniform method for evaluating the impacts of land use decisions on the Congestion Management Program (CMP) system. These guidelines are presented in the Congestion Management Program Transportation Impact Guidelines adopted May 7, 1998 and updated on March 29, 2004. Copies of CMP Guidelines are included in the CD-ROM version of this Handbook.

The VTA requires all local jurisdictions to conform to the CMP TIA guidelines to evaluate the transportation impacts of all land use decisions within the Member Agency's jurisdiction that are projected to generate 100 or more AM or PM weekday peak-hour trips. Any non-conformance issues in the TIA should be identified and clearly presented. While the VTA's TIA guidelines provide a basis for analysis, the City of San José's TIA guidelines differs from the VTA's guidelines.

The primary difference between the VTA guidelines and The City of San José guidelines is the minimum Levels of Service threshold that is required of each jurisdiction. VTA requires a minimum LOS E while the City requires LOS D. Therefore, it is possible for an intersection to be operating at a deficient Levels of Service (or to have an impact) according to the City of San José's criteria but not the VTA's. It should be noted that significant impacts and deficient levels of service should be identified in the TIA according to the City of San José's guidelines. In addition, the criteria the VTA requires should be identified in the TIA and used to demonstrate conformance with the VTA guidelines.

Some other areas where the VTA and City of San José Guidelines differ are presented below:

- Exemptions from Levels of Service standard (see Downtown Area General Plan Policy)
- VTA allows the establishment of a deficiency plan for impacts that cannot be fully mitigated

III. TIA PROCESS

INTRODUCTION

The City of San José's Department of Public Works determines the need for a TIA in conformance with policies set forth by the City Transportation Impact Policy. A TIA is required for a project to comply with both the City of San José's Transportation Impact Policy (Council Policy 5-3) and the Santa Clara County's Congestion Management Program (CMP).

A TIA is generally required based on the number of peak-hour trips generated by the project using City of San José approved trip generation rates. The Institute of Transportation Engineers (ITE) also provides trip generation rates for a variety of land uses that may be used for comparison purposes or for land uses not included in the City's table of trip generation rates. Rates obtained through surveys of similar land uses may also be used when appropriate. The City of San José has final authority and must approve the trip generation rates used in the TIA analysis.

The objective of the TIA process is to ensure that development projects address traffic impacts and/or operations in accordance with the requirements and goals of both the City and the CMP.

TRAFFIC IMPACT ANALYSIS REVIEW FEE

A review fee is required of all TIAs. Review fees are due to the Department of Public Works and review will not begin until full payment is received. Contact the Department of Public Works for current fee schedule.

TIA PROCESS AND SUBMITTAL

The TIA process, as illustrated in Figure 7 on page 23, begins with the calculation of trip generation for a development project. If a project meets exemption for traffic impact analysis as determined by the City, there is no further requirements for preparing traffic impact analysis. Otherwise, the traffic consultant shall submit a written work scope to the City for review and approval. The proposed work scope should include the following:

- Project description
- Project site plan
- Proposed trip generation rates and estimates
- Proposed trip distribution
- Proposed trip assignment
- Preliminary list of study intersections
- Any traffic or transportation operational issues identified (such as signal warrant, etc)

- Any site specific issues

City will review and revise the preliminary work scope for completeness and consistency with relevant City policies and procedures. Upon completion of draft work scope review, City will issue a final work scope to the traffic consultant and/or the project proponent. Traffic consultants must complete the traffic impact analyses according to the final work scopes, and submit draft TIA reports to City for review and comment. City will provide City's Approved Trip Inventory and City's TRAFFIX database that are necessary for analyses upon issuance of final work scopes.

Upon receipt of the draft TIA report, City will coordinate internally and externally for review and comments. City will provide comments on the draft report that should be incorporated into the final TIA report. Traffic consultants should work closely with City staff on impact determinations and mitigation measures. A total of three (3) final TIA reports must be submitted to the Departments of Public Works and Planning. All required revisions identified by City staff must be included in the final report or addressed separately. The final report must be prepared to the satisfaction of City staff.

It is the responsibility of the Consultant to budget adequate time for the process, in order to ensure that the project will meet public hearing dates. For projects categorized as special handling or those that would involve special case studies, which are not part of a typical TIA, the timeline may vary.

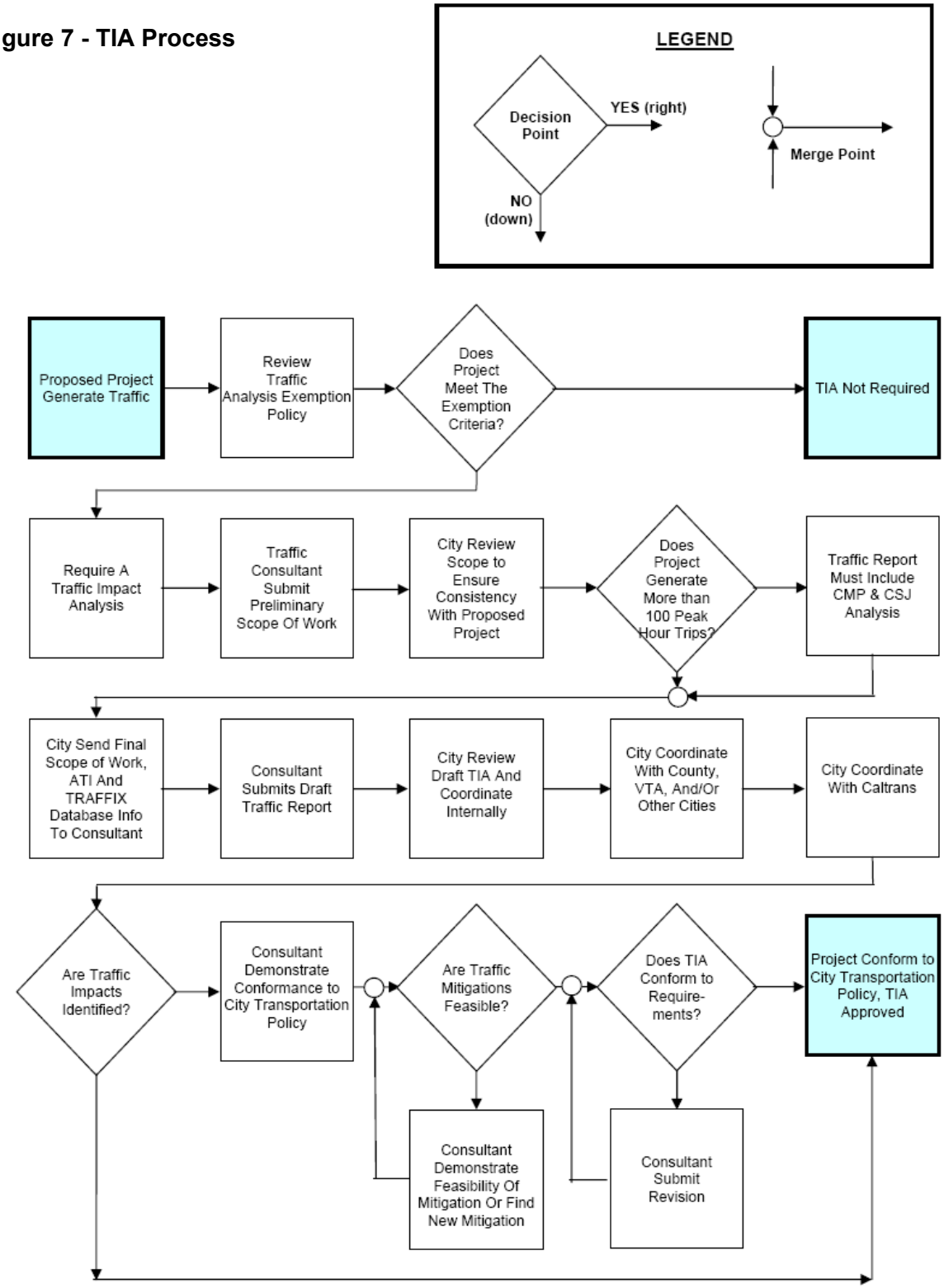
As a general comment, all tables and figures included in the TIA must be legible and professionally prepared. Three (3) copies of the draft report including appendices must be submitted to City staff for review along with the required traffic review fee. The draft submittal will be reviewed by City staff in accordance to City Policies and Guidelines. The draft report shall not be publicly circulated until City staff has determined it to be complete.

TIA UPDATE

To ensure that the information included in the TIA is current and correct, TIA updates may be required by City staff on a project-by-project basis. Criteria to be considered for the TIA update include:

- If the traffic condition and pattern has significantly changed
- If related transportation policies and/or guidelines have significantly changed

Figure 7 - TIA Process



IV. CONTENTS OF A TIA

OVERVIEW

This section describes the general requirements as well as the key elements expected by the City of San José for a typical TIA. Each key element is a section topic to be included in the TIA report, and is described in greater detail below in the order they normally appear in a TIA report. Examples of tables and figures are provided when appropriate. A TIA report is considered incomplete and will be rejected by the City unless all general requirements and key elements are met.

GENERAL REQUIREMENTS

This section describes the general requirement for project description, study periods, locations, and scenarios.

Project Description

A project description must be included to identify the size and location of the proposed project. The project description should be consistent with the application filed for the project.

Study Periods

The weekday morning (AM) and evening (PM) peak hours are the typical time periods analyzed in a TIA. The morning peak period usually occurs between 7:00 and 9:00 am and the evening peak period usually occurs between 4:00 and 6:00 pm. In certain corridors, other peak period analyses may be required in addition to these designated peak periods described above.

Additional time periods may need to be analyzed to measure the effect of certain land uses with atypical peak hours on the transportation system. Some land uses such as schools, theaters, and commercial space may have peak traffic generating characteristics at times other than the typical morning and evening peak periods. In these instances, City staff will provide direction as to which time periods will be required in the work scope. Under no circumstances should peak spreading be considered in TIA reports as a basis of subsiding peak period traffic or congestion.

Study Locations

The appropriate study intersections for a specific project are determined by using the same method contained in the VTA's guidelines. The VTA's guidelines use a "10 trip per hour per lane" rule requiring an intersection be included for analysis if 10 or more project-generated trips utilize a travel lane during one or more peak hours. However, it should be noted that intersections that do not meet this criterion may be included at the discretion of City staff.

Study Scenarios

The City of San José requires that the following four study scenarios be included in a TIA. A detailed description of each scenario is provided.

- *Existing Conditions* – includes recent traffic counts
- *Background Conditions* – includes recent traffic counts plus traffic from approved but not yet constructed developments
- *Project Conditions* – includes recent traffic counts, plus traffic from approved but not yet constructed developments, and project-generated traffic
- *Cumulative Conditions* - includes recent traffic counts, plus traffic from approved but not yet constructed developments, plus project-generated traffic, and traffic from pending developments and/or a growth factor

KEY ELEMENTS

This section describes the key elements needed to meet the requirements the City of San José has established for a complete TIA. These key elements are organized as they would normally appear in a typical TIA report, as illustrated in the sample Table of Contents in Figure 8 on page 26. A description of each section key element is provided as a section henceforward.

Executive Summary

The Executive Summary (ES) provides a brief description of the traffic analysis and impacts that the proposed project is expected to have on the transportation system. The ES should provide a table that presents the levels of service for all study intersections and all study scenarios (see Table 2 for example). The impacts and proposed mitigation measures to the transportation system should also be identified. Other noteworthy findings, conclusions, and recommendations on traffic operations and bicycle/pedestrian issues should also be addressed in the ES as appropriate.

Figure 8 - Table of Contents Example

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San José TIA Handbook Example

TABLE 2
INTERSECTION LEVELS OF SERVICE SUMMARY EXAMPLE

Node	Intersection	Peak Hour[1]	Existing		Background		Project				Project w/ Mitigation	
			Avg Delay[2]	LOS[3]	Avg Delay[2]	LOS[3]	Avg Delay[2]	LOS[3]	Δ in Crit Delay[4]	Δ in Crit V/C[5]	Avg Delay[2]	LOS[3]
4001	Maple Street/Pine Street	AM	16.5	B	31.4	C	34.1	C	+3.4	+0.035	-	-
		PM	16.1	B	37.7	D	40.2	D	+3.2	+0.035	-	-
3252	Maple Street/Elm Street	AM	16.2	B	33.1	C	37.0	D	-9.3	-0.053	-	-
		PM	15.8	B	92.7	F	**105.1**	**F**	**+4.4**	**+0.020**	40.8	D

Notes:

Boldface indicates a significant impact

1 AM = morning peak hour, PM = evening peak hour.

2 Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections using methodology described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions.

3 LOS = Levels of Service

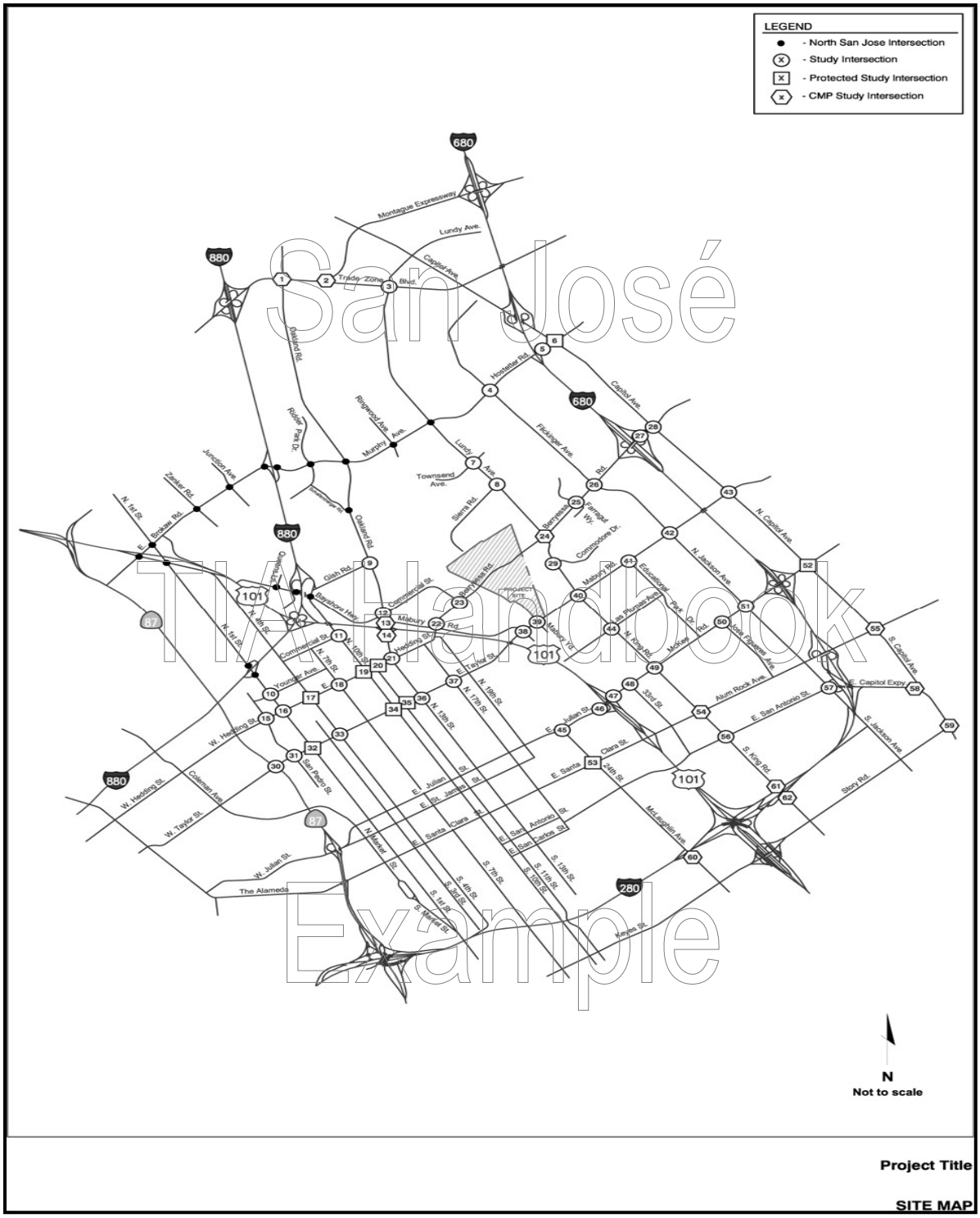
4 Change in critical movement delay between Background and Project Conditions.

5 Change in the critical volume-to-capacity ratio (V/C) between Background and Project Conditions.

Introduction

The first chapter of the report describes the study periods, locations, and scenarios used in the TIA. This chapter will also include a project description and the methodology used to perform the analysis. Figures required for this section include a site location map and a site plan. Figure 9 on page 28 illustrates a sample site location map that would be required. A latest site plan is required to show adjacent intersections, site access, on-site circulation, and parking layout of the proposed project.

Figure 9 - Site Map Example



Existing Conditions

The existing scenario depicts the existing conditions of the transportation system within the study area of the proposed project. The TIA shall describe the physical characteristics of the surrounding roadway network including the existing roadway cross-sections, intersection lane configurations, traffic control devices, and surrounding land uses. This chapter shall also include descriptions of pedestrian, bicycle, and transit facilities. Figures showing the existing turning movement volumes and lane configurations are required and figures showing the existing pedestrian, bicycle and transit facilities are recommended. Figure 8 on page 30 shows an example of a report figure depicting existing turning movement volumes and lane configurations. Figures 11 and 12 present examples of existing pedestrian and bicycle facilities as well as existing transit facilities. The intersection control, average control delay, corresponding LOS, and count date should be presented in tabular form under Existing Conditions. Table 3 shows an example of this form. If applicable, the freeway segment density and Levels of Service should also be presented in tabular form. An example of this is presented in Table 4.

TABLE 3
EXISTING INTERSECTION LEVELS OF SERVICE EXAMPLE

Node	Intersection	Peak Hour[1]	Count Date	Delay[2]	LOS[3]
3011	Redwood Road/Cypress Avenue**	AM	09/07/05	9.2	A
		PM	09/12/05	11.5	B+
4002	Elm Street/Cypress Avenue	AM	09/07/05	37.4	D
		PM	10/23/05	35.7	D

Notes:

1 AM = morning peak-hour, PM = evening peak-hour.

2 Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections using methodology described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions.

3 LOS = Levels of Service

** Designated CMP intersection.

Figure 10 - Existing Conditions Peak Hour Volumes and Lane Configurations Example

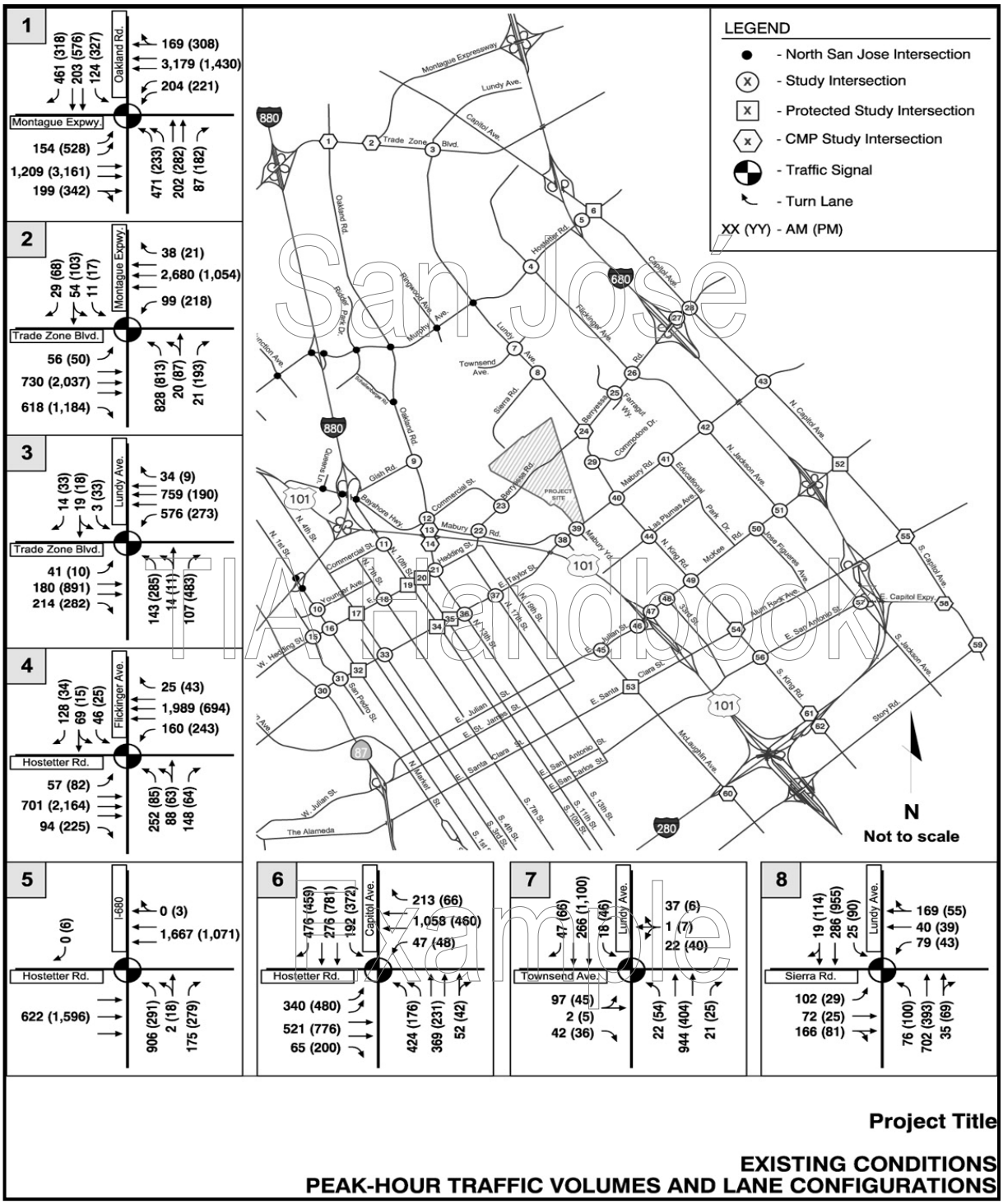
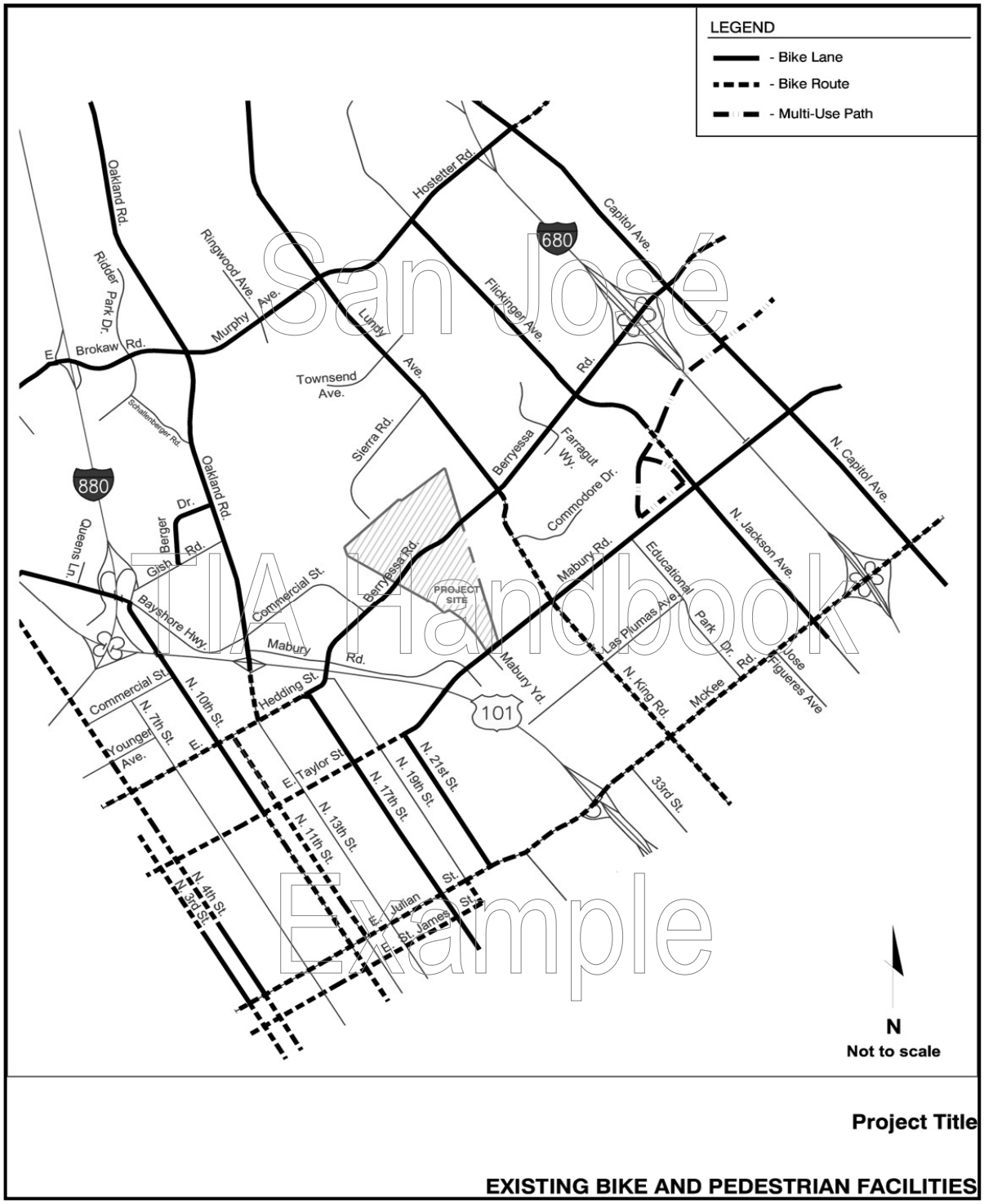


Figure 11 - Pedestrian and Bicycle Facilities Example



San José TIA Handbook Example

Figure 12 - Transit Facilities Example

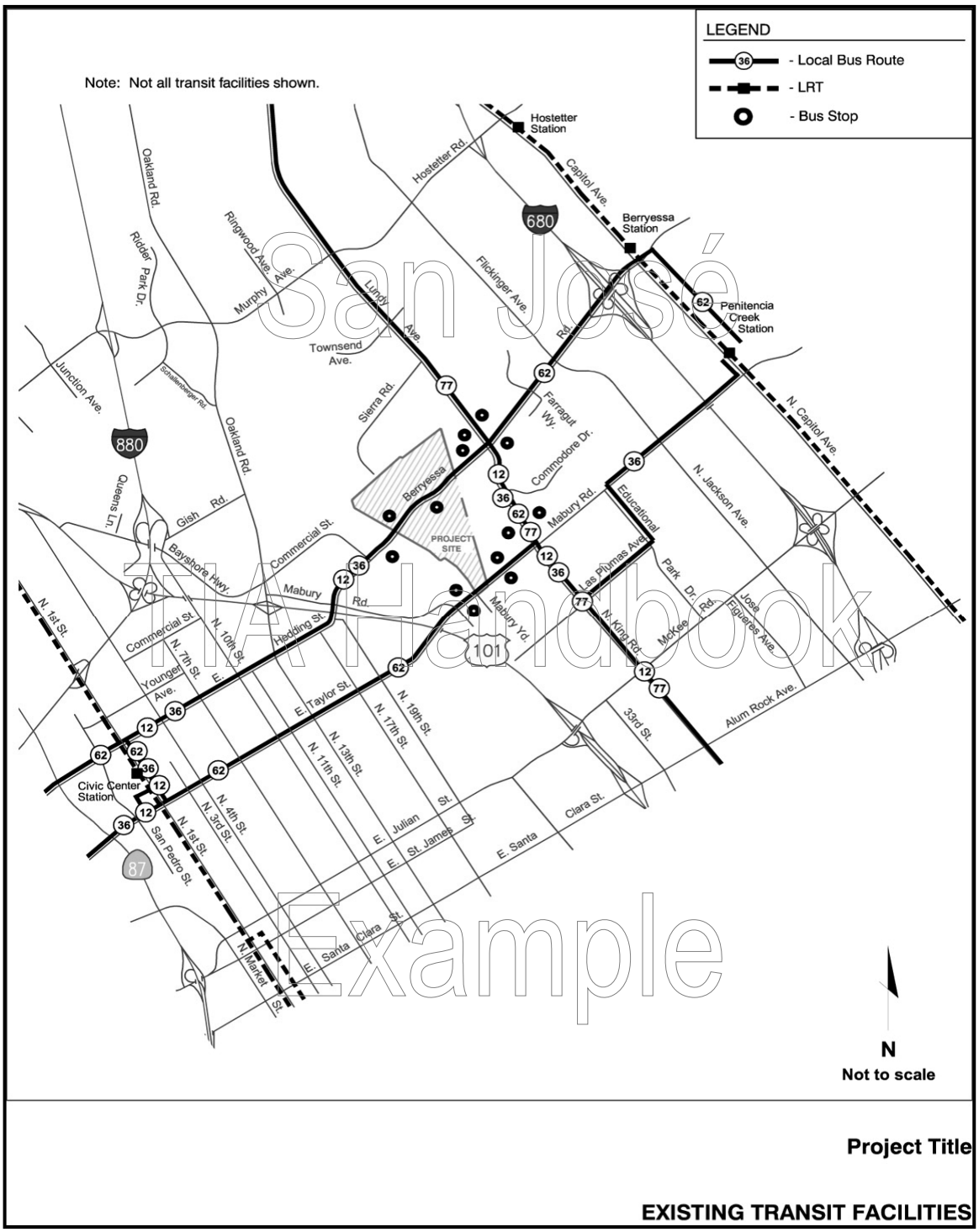


TABLE 4 EXISTING FREEWAY SEGMENT LEVELS OF SERVICE EXAMPLE									
Direction	**From/To**	**From/To**	**Peak Hour**	**Number of Lanes**		**Density[1]**		**LOS**	
				Mixed	**HOV**	**Mixed**	**HOV**	**Mixed**	**HOV**
NB SR-87	I-280	Alma Ave.	AM	2	0	32	N/A	D	N/A
			PM	2	0	31	N/A	D	N/A
	Julian St.	I-280	AM	2	0	25	N/A	C	N/A
			PM	2	0	14	N/A	B	N/A
	Coleman Ave.	Julian St.	AM	2	0	44	N/A	D	N/A
			PM	2	0	17	N/A	B	N/A

Notes:

1 Density based on volume from VTA's latest CMP Monitoring Data

2 NB - Northbound; SB - Southbound; EB - Eastbound; WB - Westbound.

Levels of Service Methodology

The City of San José requires using the latest version of the Highway Capacity Manual (HCM) for analysis of transportation facilities. This is consistent with the VTA methodology as well as typical traffic engineering practices. The VTA adjusts the saturation flow rates to calibrate the rates to local conditions. The City of San José conforms to the methodology for analyzing intersections and freeway segments as described by the VTA. Traffic consultants should discuss with City staff for the special methodology requirements within the Evergreen Area Development Policy area.

Count Data

Typically, the City will request new traffic volume counts from developer's traffic consultants if the latest existing counts are more than eighteen months old. In special cases where other circumstances might prevail such as recent changes in traffic patterns, a traffic count may be requested at the discretion of City staff. New intersection turning volume counts, if required by the City, shall be collected and processed by traffic consultants as follows:

- Obtain new peak period turning movement counts at the selected intersections as required by the City. Intersections are to be counted only Tuesdays through Thursdays (during non-holiday periods and not on a day before or after a holiday) under fair weather conditions. Studies of certain land uses may require intersection turning movement counts during a non-standard peak period. The work scope will specify the time period for which intersection turning movement counts should be taken.
- The peak hour volumes consist of the traffic volumes from the four highest consecutive 15-minute count intervals during the peak period.
- Review and evaluate each new count and notify staff of any irregularities or discrepancies found.

- Submit new counts along with any evaluation comments to the City for review and approval. The counts will be incorporated into the City's count inventory.

Field Observations

All TIA reports shall include and thoroughly address field observations of traffic and circulation within the study area. The consultant is required to conduct a field review of the traffic, which includes at a minimum, driving the study area roadways and observing the study intersection operations during the peak commute periods (7:00 to 9:00 am and 4:00 to 6:00 pm).

Field observations shall identify and address the following issues:

- Ramp meter effects on local streets
- Uneven lane demand and usage
- Effect of on-street parking
- Pedestrian and bicycle safety issues
- Cut-through traffic in neighborhoods
- Sight distance problems
- Intersection with gridlock conditions to potentially explain low peak period traffic counts
- Queuing and storage length
- Effect on transit operations
- Truck Routes

The field observations shall be documented in the TIA along with the date, day, and time of the field visit. The calculated levels of service should correspond with the observed LOS in the field. The field observations shall be transmitted to City staff. Based on the professional opinion of the consultant, recommendations may be made to supplement the work scope to address unique issues identified in the field.

Ramp meters are not required to be analyzed under CMP guidelines and CEQA guidelines do not require identification of impacts caused by ramp metering. However, the TIA shall identify all ramp meters within the study area. The TIA shall describe the existing queues, estimate the travel time to get through the queue, and describe the effect of the ramp meters on local streets and intersections. The City has ramp meter data for ramp meters with known queuing problems. Therefore, if ramp meter data is available in a specific study area, the City will provide the information for the consultant to verify and add any further information on the problems.

Background Conditions

Background Conditions represent baseline conditions from which project impacts are identified. The City will provide an Approved Trip Inventory (ATI) that represents the traffic volumes generated by projects that are approved but have not been constructed. ATI volumes should be added to the existing intersection volumes to represent Background Conditions. The preparer of the TIA should review the ATI and verify the accuracy of the volumes provided by the City to the extent possible (i.e., balanced volumes

between adjacent intersections). The City will also provide information on any funded roadway improvements that should be included in the Background Conditions analysis. This is not limited to improvements at the study intersections but also includes street closures, traffic calming measures, or other improvements that could affect the travel patterns within the project area.

The TIA should include figures showing the Background Conditions turning movement volumes and tables showing the average control delay and corresponding LOS for the study intersections. Figure 13 on page 36 presents an example of Background Conditions turning movement volumes. Intersection average control delay and corresponding LOS should be presented in tabular form under Background Conditions. Table 5 presents an example.

TABLE 5
BACKGROUND INTERSECTION LEVELS OF SERVICE EXAMPLE

Node	Intersection	Peak Hour[1]	Delay[2]	LOS[3]
3011	Redwood Road/Cypress Avenue**	AM	33.1	C
		PM	92.7	F
4002	Elm Street/Cypress Avenue	AM	37.4	D
		PM	35.7	D

Notes:

1 AM = morning peak-hour, PM = evening peak-hour.

2 Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections using methodology described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions.

3 LOS = Levels of Service

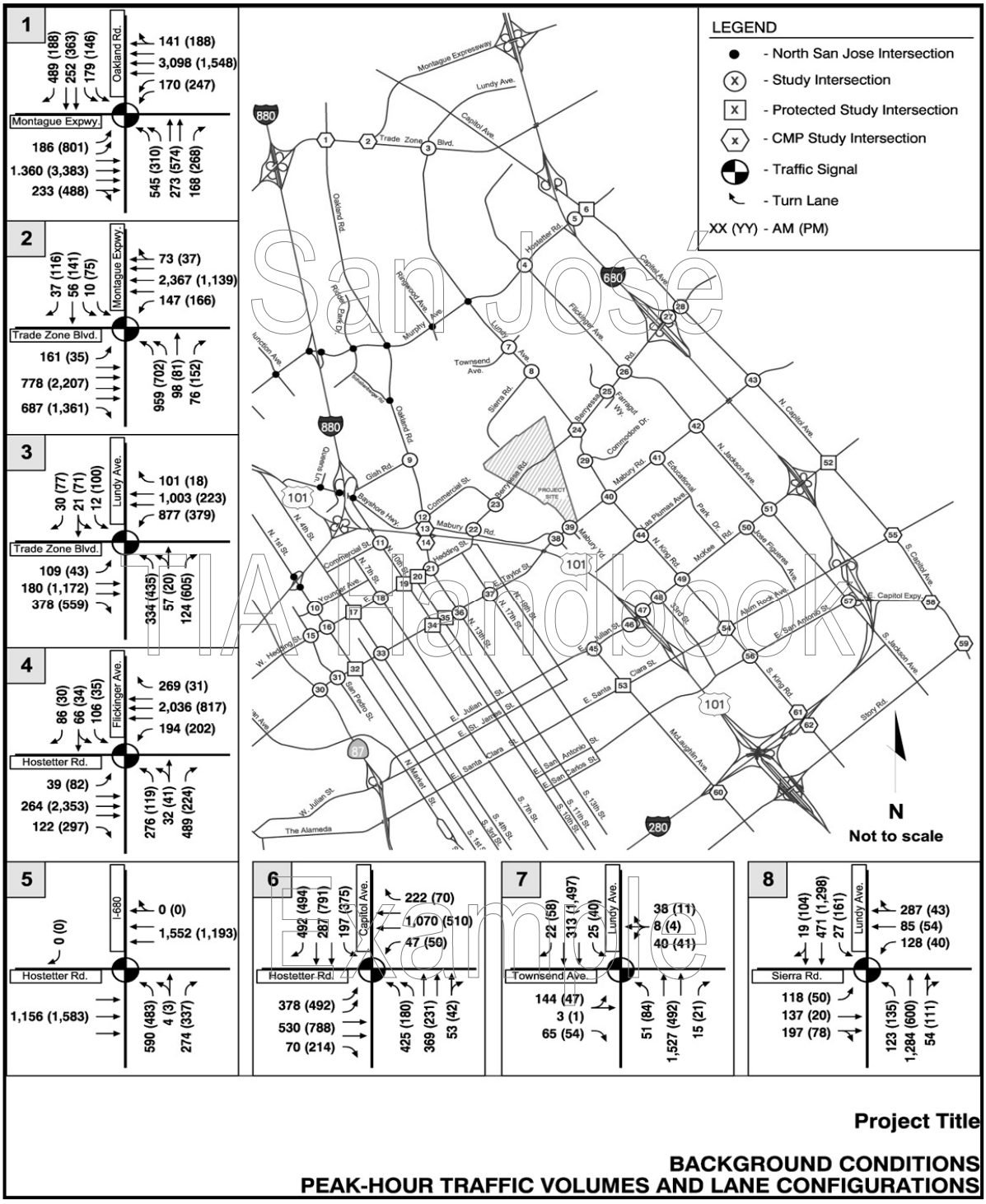
** Designated CMP intersection.

Project Conditions

The Project Conditions will be used to determine the impacts that the proposed project will have on the transportation system. This scenario comprises project-generated traffic added to the Background Condition volumes. Figures showing the Project Conditions total volumes and project-generated traffic peak-hour volumes at each study intersection (trip assignment) are required for this scenario. Figure 14 and Figure 15 (pages 37 & 38) illustrate examples of these figures. The trip distribution for the proposed project should also be presented under this scenario. Figure 16 (page 39) provides and example of a trip distribution figure.

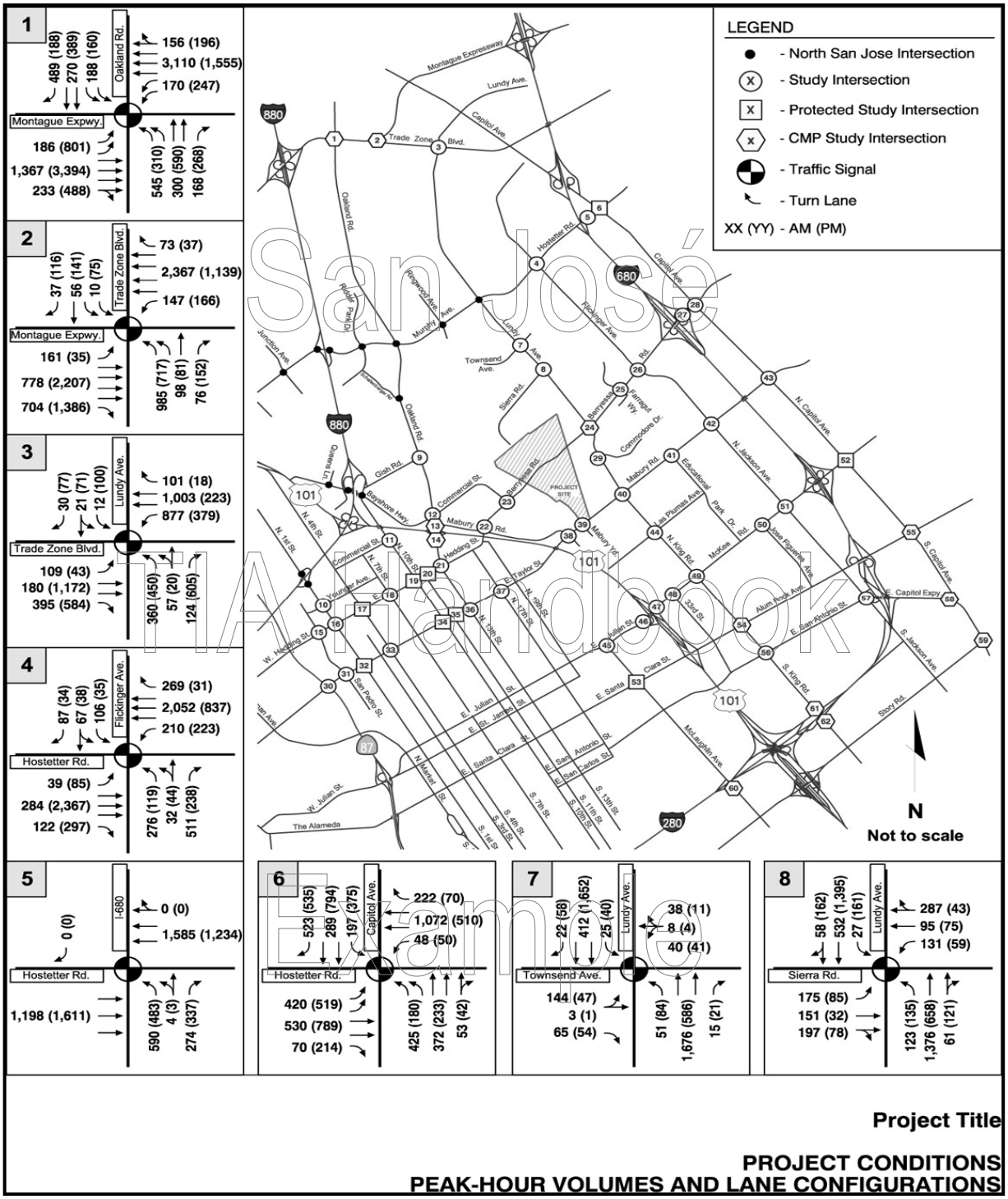
The appropriate trip generation rates and estimates should be presented and sourced in a table. Under Project Conditions provide one table that presents average control delays and corresponding LOS for both Background and Project Conditions, increases in average critical delays (compared to Background Conditions), and increases in critical volume-to-capacity ratio (compared to Background Conditions) is required. An example of this table is illustrated in Table 6.

Figure 13 - Background Conditions Peak Hour Volumes and Lane Configurations Example



San Jose ITA Handbook Example

Figure 14 - Project Conditions Peak Hour Volumes and Lane Configurations Example



San José TIA Handbook Example

Figure 15 - Project Generated Peak Hour Volumes Example

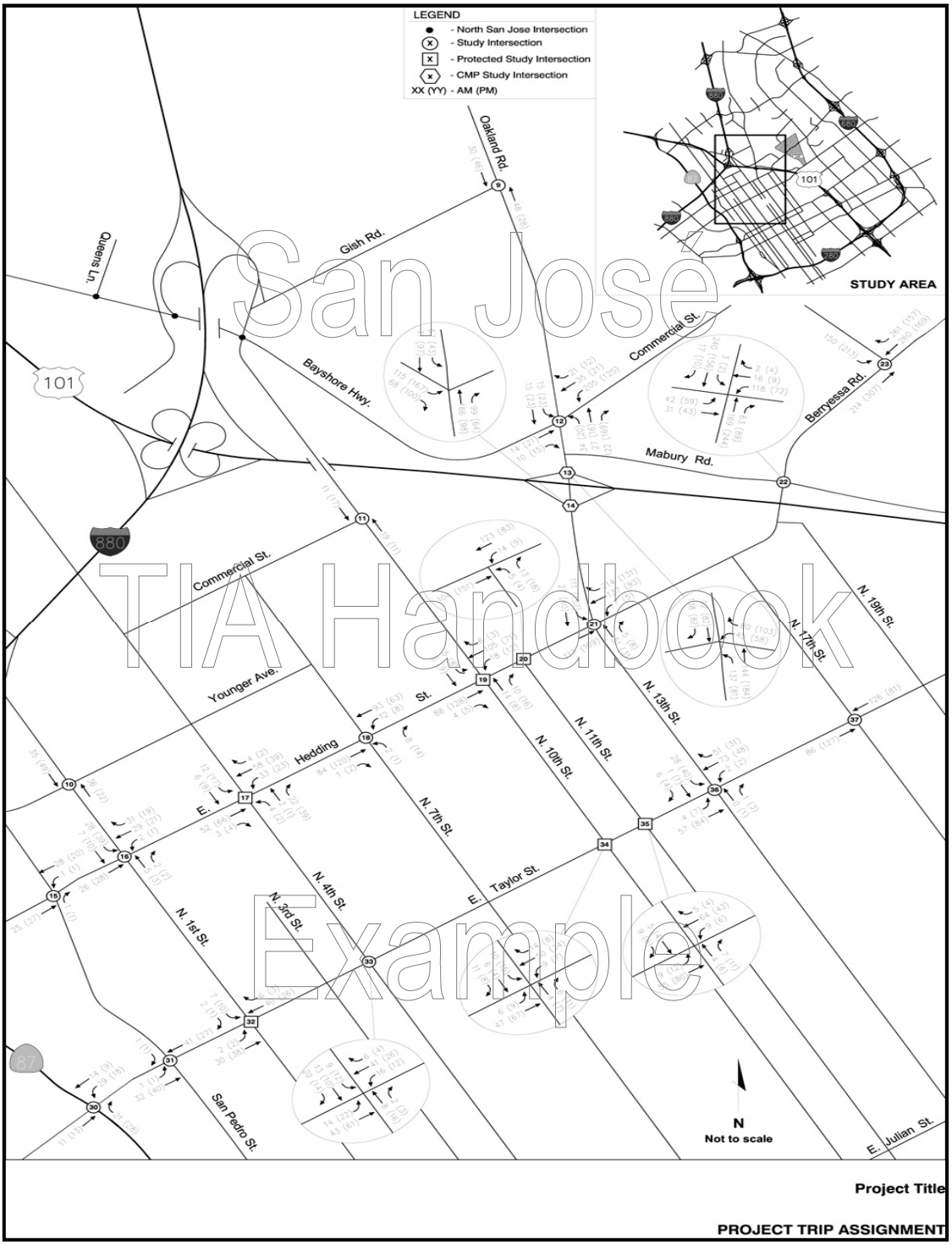


Figure 16 - Project Conditions Trip Distribution Example

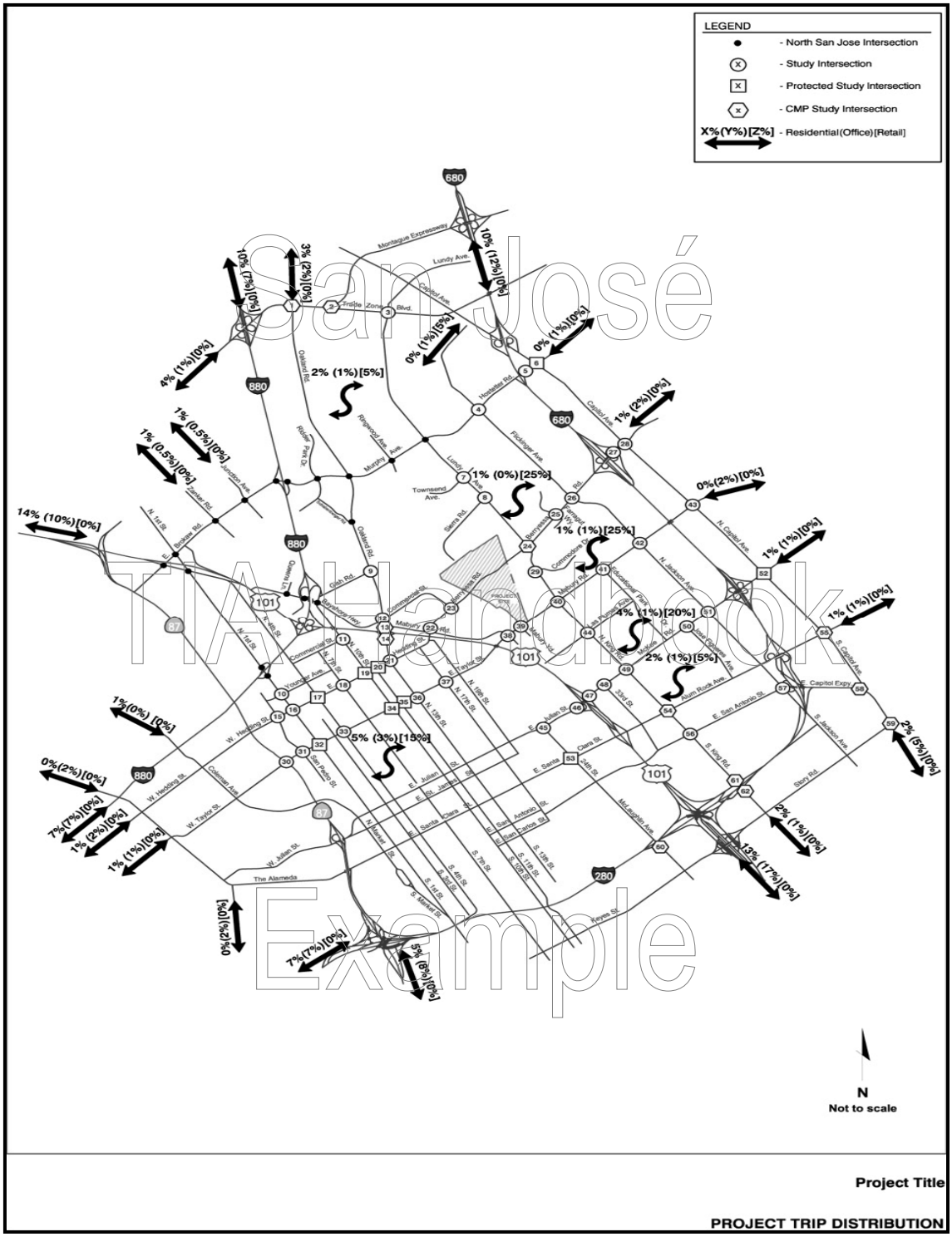


TABLE 6
BACKGROUND AND PROJECT INTERSECTION LEVELS OF SERVICE EXAMPLE

Node	Intersection	Peak Hour[1]	Background		Project			
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit Delay[4]	Δ in Crit V/C[5]
3011	Redwood Road/Cypress Avenue**	AM	33.1	C	37.0	D	-9.3	-0.053
		PM	92.7	F	**105.1**	**F**	**+4.4**	**+0.020**
4002	Elm Street/Cypress Avenue	AM	40.7	D	40.7	D	+0.1	+0.001
		PM	56.3	E	52.8	D	-5.4	-0.021

Notes:

Boldface indicates a significant impact

1 AM = morning peak-hour, PM = evening peak-hour.

2 Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections using methodology described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions.

3 LOS = Levels of Service

4 Change in critical movement delay between Background and Project Conditions. A decrease in the critical delay indicates project trips were added to movements with low delays thus causing a decrease in the overall critical delay.

5 Change in the critical volume-to-capacity ratio (V/C) between Background and Project Conditions.

** Designated CMP intersection.

Site access, on-site circulation, and parking assessment of the proposed project should also be included under this scenario. The adequacy of the driveways to serve project-generated traffic as well as the proposed layout of the circulation and parking aisles should be reviewed. The parking supply should be compared to the City's parking code requirements for the land use.

Trip Generation

The activities (i.e. different land uses) associated with a proposed development should be separated into components where trip generation rates can be applied. For general analysis purposes, the morning and evening weekday peak hour trip generation rates are used. Trip generation rate studies may be required of some projects to properly account for specific or unique land use(s). If a project's peak hour does not occur during the morning or evening peak periods, specific trip generation rates may need to be developed for the project's peak hour.

To properly develop trip generation, the following steps shall be taken:

- Estimate project-generated traffic using vehicular trip generation rates of the Institute of Transportation Engineers (ITE), the San Diego Association of Governments (SANDAG), or the City of San José. The City of San José's trip generation rates are included in Appendix B. If a proposed land use is not included in any of the previous sources, the preparer should work with City staff to determine another method or source such as the surveys of similar land uses to develop an appropriate rate.
- If a proposed project replaces a land use that previously generated trips which are included in the most recent turning movement counts, then those aforementioned trips can be deducted from the trip generation of the proposed project. The project traffic distribution and assignment shall be considered to reflect net change in trips.
- City staff shall approve the vehicular trip generation rates (and any reductions or modifications from the City's trip generation rates) that are included in the final work scope. The TIA should identify the source of the trip generation rate data in the report.

Trip Reductions

Trip reductions may be applied to projects if one or more of the following strategies to encourage alternative modes of transportation are included: mixed-use development, a transportation demand management (TDM) program, and/or development near transit stations or major bus lines. The City of San José uses the same trip reduction methodology as the VTA. Refer to VTA guidelines for specific reductions. If a project proposes a TDM program, the consultant shall submit the proposed program along with any supporting information for City staff review and approval prior to reduction of any vehicle trips.

Any trip reduction or credit claimed should be documented along with the proper supporting data and should be reviewed and approved by City staff. Combining any of the above strategies should follow the same methods allowed by the VTA TIA Guidelines.

Pass-by/Diverted Link Trips

Pass-by trips are intermediate stops on the way from an origin to a primary destination without diverting to another street. Diverted link trips are trips that are attracted from the traffic volume on roadways in the area but require a diversion from one roadway to another roadway to gain access to the site. For example, drivers of approximately half of the vehicles entering a gas station intend to go to the gas station only (i.e., the station is the primary destination). The other half of the vehicles are already on the roadway system and stop at the gas station on the way to some other destination. Pass-by and diverted link trips comprise the second half of the gas station vehicle trips.

The percent of pass-by/diverted link trips to be subtracted from the gross trip generation numbers should be estimated based on data provided by ITE or actual surveys of similar land uses. The net new trip generation estimates should be used to assign project trips to the roadway network and the appropriate pass-by/diverted link trips should be added to or subtracted from the appropriate intersection turning movements.

Trip Distribution

Trip distribution for proposed developments can be determined from zip code data, census data, market research, travel demand forecasting models, existing travel patterns, and/or the location of complementary land uses. The trip distribution should reflect a similar pattern used for developments with the same land use in the same geographic area.

The trip distribution methodology shall be documented in the TIA, and the following steps shall be adhered to:

- Forecast the trip distribution of project-generated traffic based on proposed land use, existing travel patterns, site accessibility to and from major corridors, relative location of complementary land uses in the area, and any other factors affecting the traffic pattern.
- Submit the proposed trip distribution pattern in a figure with the work scope for review and approval by City staff.

Trip Assignment

Once the project trip distribution is approved by City staff, the project trips can be assigned to the roadway network. Trip assignment involves determining the amount of traffic that will use certain routes on the roadway network. The trip assignment will illustrate the project-generated trips, by direction and turning movement, on each roadway segment of the study area. The procedure for assigning project-generated trips is as follows:

- Assign the project-generated traffic to the roadway network according to the trip distribution for each proposed land use.
- Account for any turning movement restrictions (i.e., one-way streets, ramps, movement restrictions and raised median islands, etc.) or other unique roadway characteristics including excessive congestion.
- Submit a project trip assignment worksheet with the initial request for work scope to the City staff. This worksheet should contain the project traffic turning movements at each study intersection and all signalized intersections in the project vicinity even though the traffic volumes at those intersections do not warrant LOS analysis. City staff will review and approve the final trip assignment used in the TIA. When the subject project is approved by the City, these trips will appear in the ATI as approved trips to be used for other traffic analysis in the area.

Project Impacts and Mitigation Measures

The significant impacts of the project are summarized in this section of the TIA report. For signalized intersections located within City's boundaries, a significant impact is determined as described on page 6 under *Significant LOS Impacts*.

Physical improvements are required to mitigate all project impacts unless an intersection is designated as a "Protected Intersection." Improvements could include street widening, lane additions, changes in the allowed movements, traffic signal modifications or installations, and/or modification of the project description. Both the Departments of Transportation and Public Works must approve any proposed mitigation measure. The TIA must provide the mitigated Levels of Service and a description of how the proposed mitigation will improve the transportation system. Conceptual plans of the proposed mitigation measures must also be presented in the TIA. Refer to City Transportation Impact Policy for mitigation of Protected Intersections.

In situations where other city's signalized intersections are evaluated for project impacts, a significant impact is determined according to respective city's guidelines or standards. Coordination with respective city's traffic engineer and/or staff should be incorporated in the TIA for impact assessment and contribution to mitigation.

Freeway Analysis

The CMP requires the evaluation of freeway facilities to determine the effect of the project-generated traffic on these facilities. Therefore, TIA requirements should include the analysis of freeway segments if the project is expected to add traffic equal to at least one percent of the freeway segment's capacity. Freeway segments are evaluated using VTA's analysis procedure, which is based on the density of traffic flow using methods described in the 2000 Highway Capacity Manual. Density is expressed in passenger cars per mile per lane. The CMP range of densities for freeway segment Levels of Service is presented in the CMP guidelines. These ranges are based on the 2000 HCM Levels of Service threshold with adjustments to reflect local (Santa Clara County) conditions.

For calculating the percentage of project-generated traffic based on the freeway segment capacity, the following ideal capacities shall be used: 2,200 vphpl for four-lane freeway segments and 2,300 vphpl for six-lane or larger freeway segments. For five-lane freeway segments, 2,200 vphpl shall be used for the two-lane direction and 2,300 vphpl for the three-lane direction. Auxiliary lanes shall not be considered for the purpose of this calculation. An example of a summary of this analysis is presented in Table 7.

TABLE 7
PROJECT FREEWAY SEGMENT LEVELS OF SERVICE EXAMPLE

Direction	From/To	From/To	Peak Hour	Number of Lanes		Density[1]		LOS	
				Mixed	HOV	Mixed	HOV	Mixed	HOV
NB SR-87	I-280	Alma Ave.	AM	2	0	33	N/A	D	N/A
			PM	2	0	31	N/A	D	N/A
	Julian St.	I-280	AM	2	0	28	N/A	C	N/A
			PM	2	0	15	N/A	B	N/A
	Coleman Ave.	Julian St.	AM	2	0	44	N/A	D	N/A
			PM	2	0	19	N/A	B	N/A

Notes:

1 Density based on volume from VTA's latest CMP Monitoring Data

2 NB - Northbound; SB - Southbound; EB - Eastbound; WB - Westbound.

Evaluation of Transit Services and Bicycle and Pedestrian Facilities

A pedestrian, bicycle, and transit assessment should be performed in the TIA. The TIA should consider the following when evaluating the pedestrian, bicycle and transit impacts:

- Consistency with City's and VTA's Pedestrian Master Plan
- Consistency with City's and VTA's Bicycle Master Plan
- Addition/relocation/reconstruction of bike ways, side walks, curb ramps, etc.
- Modification of transit facilities: relocation or reconstruction of transit stops

While there are no specific criteria for determining impacts, adequate facilities should be identified for each mode to and from the project site.

Other Operational Issues

As part of a complete TIA, operational analysis plays an important role. Operational analysis is a function of the Department of Transportation. The Transportation Planning Division serves as the coordinator to ensure that operational issues are not bypassed in the TIA. The preparer of the TIA must consider operational constraints of the project and the possible mitigation improvements. Operational analysis includes such issues as:

- Left-turn pocket storage capacity
- Right-turn storage capacity
- Median island or channelization island movement restrictions
- On-site vehicular circulation
- Need and/or adequacy of acceleration/deceleration lanes
- Residential neighborhood impact study
- Signal warrant study (see the Signal Warrant Studies section below for further details)
- Stop sign warrant study
- Average Daily Traffic (ADT) evaluation
- Effect of signalization on existing signal coordination plans
- Justification for and feasibility of any signal phasing or lane configuration changes at intersections
- Drive-through use
- Truck turning template analysis

Proposed solutions should be identified and recommended within the report to address these issues.

Typically, only signalized intersections are analyzed as part of a City of San José TIA. However, some unsignalized intersections may be included for analysis as determined by City staff. If an unsignalized intersection is significantly impacted or the addition of project-generated traffic will create an operational problem at the intersection, a signal warrant analysis may be needed. Signal warrant studies are performed to determine the need for installation of a traffic signal at an intersection. Furthermore, the decision to install a signal is not based solely upon the warrants. The warrants are based on those included in the Manual on Uniform Traffic Control Devices (MUTCD). There are a total of eight (8) warrants under MUTCD. The specific warrants are performed depending on project site specifics.

Legible signal warrant study worksheets are to be included within the appendix of the TIA report. The results are to be discussed within the context of the report. If the development traffic meets the applicable signal warrants, the project will be conditioned to either contribute towards or construct the installation of the signal.

Site access, on-site circulation, and parking assessment of the proposed project should also be included in this section. The adequacy of the driveways to serve project generated traffic as well as the proposed

layout of internal circulation and parking aisles should be reviewed. The parking supply should be compared to the City's parking code requirements for the land use.

City reserves the right to require special analysis for developments that are complex due to location, land uses, or site access issues and that are unique or non-standard. A focused TIA may be required for a proposed development even if it is exempt from the Citywide LOS or Area Development Policies.

Cumulative Conditions

Cumulative Conditions represent a future scenario to determine the combined effect of multiple pending projects or foreseeable developments with individually limited impacts on the transportation system. The Cumulative Conditions scenario will include volumes from Project Conditions plus traffic from pending or foreseeable developments in the area. If appropriate, a growth factor may be used instead of, or in addition to, the pending development trips. City staff will determine the methodology that will be used on a project-by-project basis for Cumulative Conditions.

The list of pending developments should be obtained from the Planning Department. The City of San José provides a list of pending developments by district on its website. For the most current list please refer to the Planning Department's website and have the list verified by DOT staff. The preparer of the TIA should use this pending list to estimate trip generation, distribution, and assignment for the pending projects. The City will also provide information on any funded roadway improvements that should be included in the Cumulative Conditions analysis. This is not limited to improvements at the study intersections but also includes street closures, traffic calming measures, or other improvements that could affect the travel patterns within the sphere of influence.

The TIA should include figures and tables, similar to those used in the Background or the Project conditions, showing the Cumulative Conditions turning movement volumes, the average control delay and corresponding LOS, the critical delay and corresponding increment, and impact determination.

Long-Term General Plan Amendment (GPA) Analysis

A GPA analysis is only included in a TIA if the amendment and the zoning or permitting process is progressing simultaneously. The GPA analysis is conducted for the General Plan horizon year, and requires the use of City's travel demand forecasting model maintained by Department of Transportation. The Consultant should coordinate with Department of Transportation staff for schedule, model run, and impact determination to ensure that the project will meet public hearing dates.

A GPA analysis may require a cumulative scenario representing General Plan buildout conditions. The General Plan cumulative scenario may be included in a TIA in lieu of the Cumulative Conditions described above as determined by City staff on a project-by-project basis.

Appendices

For ease of reading, the TIA report includes selected summary tables and pictorial exhibits that are illustrative to analyses and conclusions. Bulk of work sheets, raw data, sketches, conceptual layouts, computer printouts, etc, should be included in appendices rather than in the body of a TIA report.

When applicable, typical information expected in the appendices includes:

- Traffic counts
- Approved Trip Inventory (ATI)
- TRAFFIX Level of Service calculation
- Freeway Level of Service analysis table
- Queuing analysis
- Signal Warrant analysis
- City's CUBE model data
- Conceptual layout

Scenario specific information, i.e., TRAFFIX LOS calculation sheets, must be provided for all study scenarios. As a general rule, the appendices should include sufficient information that allows independent verification and replication of all technical analyses by any traffic engineer.

APPENDIX A – PROTECTED INTERSECTIONS

TABLE A1
PROTECTED INTERSECTIONS (AUGUST 2008)

#	Intersection	Special Planning Area	Community Improvement Zone
1	1st / Taylor	Transit Corridor	Jackson Taylor
2	4th / Jackson	Downtown Gateway	
3	4th / Hedding	Downtown Gateway	
4	10th / Hedding	Downtown Gateway Specific Plan Area	
5	10th / Taylor	Downtown Gateway Specific Plan Area	
6	11th / Taylor	Downtown Gateway Specific Plan Area	
7	Hedding / Oakland – 13th	Downtown Gateway Neighborhood Business	
8	10th / Julian	Downtown Gateway	University Neighborhoods
9	11th / Julian	Downtown Gateway	
10	10th / St. James	Downtown Gateway	
11	11th / St. James	Downtown Gateway	
12	11th / St. John	Downtown Gateway	
13	11th / Santa Clara	Downtown Gateway	
14	11th / San Antonio	Downtown Gateway	
15	10th / Reed	Downtown Gateway	
16	24th / Santa Clara	Transit Corridor	Five Wounds / Brookwood Terrace
17	7th / Virginia	Downtown Gateway	Spartan Keyes
18	The Alameda / Hedding	Downtown Gateway	Midtown North
19	Almaden / Grant	Downtown Gateway	Washington
20	Almaden / West Virginia	Downtown Gateway	
21	Vine / Grant	Downtown Gateway	
22	Capitol Avenue / McKee	Transit Corridor	Alum Rock
23	Capitol Avenue / Hostetter	Transit Corridor	Berryessa
24	Meridian / West San Carlos	Transit Corridor	Midtown South
25	Winchester / Stevens Creek	Transit Corridor	Winchester – Stevens Creek

APPENDIX B – TRIP GENERATION RATES

TABLE B1
COMMON VEHICLE TRIP GENERATION RATES FOR THE SAN JOSE AREA
(AUGUST 2008)

Type of Land Use[a]	Weekday Trip Generation Rates	AM Peak Hour		PM Peak Hour	
		Factor (%)	In/Out Split (%)	Factor (%)	In/Out Split (%)
RESIDENTIAL					
Single Family Detached	9.9/unit	10	35/65	10	65/35
Single Family Attached (Duplex, Condo, Townhouse, etc.)	7.5/unit	10	35/65	10	65/35
Apartments	6.0/unit	10	35/65	10	65/35
Retirement Community/ Senior Housing	3.6/unit	12	40/60	12	60/40
LODGING					
Hotel	9/unit	8	60/40	9	60/40
Motel	10/unit	6	40/60	6	60/40
COMMERCIAL/ RETAIL CENTERS					
Super Regional Shopping (>600K S.F.)	40/1000 S.F.	4	70/30	9	50/50
Regional Shopping (300K-600K S.F.)	50/1000 S.F.	4	70/30	9	50/50
Community Shopping (100K-300K S.F.)	70/1000 S.F.	4	60/40	10	50/50
Neighborhood Shopping (<100K S.F.)	120/1000 S.F.	4	60/40	11	50/50
Specialty Retail/Strip Commercial	40/1000 S.F.	3	70/30	9	50/50
Discount Store (i.e., Home Depot, etc.)	70/1000 S.F.	2	60/40	10	50/50
Discount Club (i.e., Costco, etc.)	58/1000 S.F.	1	80/20	8	50/50
Convenience Store (<24 hrs)	500/1000 S.F.	9	50/50	8	50/50
Convenience Store (24 hrs)	738/1000 S.F.	9	50/50	7	51/49

TABLE B1
COMMON VEHICLE TRIP GENERATION RATES FOR THE SAN JOSE AREA
(AUGUST 2008)

Type of Land Use[a]	Weekday Trip Generation Rates	AM Peak Hour		PM Peak Hour	
		Factor (%)	In/Out Split (%)	Factor (%)	In/Out Split (%)
BANKING					
Bank	150/1000 S.F.	4	70/30	12.5	40/60
AUTOMOTIVE					
Auto Repair	20/1000 S.F.	8	70/30	11	40/60
Service Station	155/ pump	8	50/50	9	50/50
RESTAURANT					
Fast food (w/drive-thru)	632/1000 S.F.	9	50/50	8	50/50
Fast Food (w/o drive-thru)	786/1000 S.F.	5	57/43	5	53/47
Sit-down, High Turnover[a]	206/1000 S.F.	8	50/50	8	50/50
Quality[b]	97/1000 S.F.	1	90/10	8	70/30
OFFICES					
Corporate Headquarters Building	8/1000 S.F.	19	93/7	18	10/90
Office Park	11.5/1000 S.F.	15	90/10	13	14/86
Research and Development	8/1000 S.F.	15	83/17	13	15/85
General Office Building	11/1000 S.F.	14	88/12	14	17/83
Medical	50/1000 S.F.	6	80/20	10	30/70
HOSPITAL					
General	20/1000 S.F.	9	70/30	10.5	30/70
Convalescent / Nursing	206/bed	7	60/40	7	40/60
INDUSTRIAL					
General Manufacturing	4/1000 S.F.	20	90/10	20	20/80
Research and Development	8/1000 S.F.	15	83/17	13	15/85
Warehouse	5/1000 S.F.	15	70/30	16	30/70
Rental Storage	2/1000 S.F.	6	50/50	9	50/50

TABLE B1
COMMON VEHICLE TRIP GENERATION RATES FOR THE SAN JOSE AREA
(AUGUST 2008)

Type of Land Use[a]	Weekday Trip Generation Rates	AM Peak Hour		PM Peak Hour	
		Factor (%)	In/Out Split (%)	Factor (%)	In/Out Split (%)
RECREATIONAL					
Theater	0.6/seat	-	-	10	60/40
	154/screen	-	-	12.4	60/40
EDUCATION					
Day Care Center	4.7/child	19	50/50	20	50/50

Notes:

For other land uses not shown, refer to ITE Trip Generation Report (latest edition) and consult with City staff. A trip generation rate study may be required for some specific land use.

a This type of restaurant is moderately priced and frequently belongs to a restaurant chain which may operate 24 hrs. a day, I.e. Denny's, Carrows, International House of Pancakes, etc.

b Examples of this type of restaurant includes first-class Continental (French or Italian), American, and Chinese restaurants.

SOURCES: *ITE Trip Generation Report, San Diego Traffic Generators*, other agencies and publications, reports and estimates.

TRAFFIC IMPACT ANALYSIS HANDBOOK

VOLUME II – POLICIES & GUIDELINES

2008

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

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General Plan Policy (2007)

Council Transportation Impact Policy 5-3 (2005)

Edenvale Area Development Policy (2005)

Evergreen Area Development Policy (1995)

North San José Area Develop Policy (2005)

North San José Deficiency Plan (2006)

US-101/Oakland/Mabury Transportation Development Policy (2008)

Methodology for Transportation Network Modeling and Analysis (2007)

Cumulative Traffic Impact Analysis Guidelines (2006)

Cumulative Freeway Analysis Guidelines (2007)

Council Drive-Through Use Policy 6-10 (1979)