



# TRANSPORTATION IMPACT ANALYSIS GUIDELINES

ADOPTED OCTOBER 2014



SANTA CLARA VALLEY TRANSPORTATION AUTHORITY  
CONGESTION MANAGEMENT PROGRAM

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CONGESTION MANAGEMENT PROGRAM**

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**October 2014**

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# PART I - STATUTE AND AUTHORITY

## Chapter 1. CMP Statute and Intent of VTA *TIA Guidelines*

On January 1, 1995, the Santa Clara Valley Transportation Authority (VTA) was designated as Santa Clara County's Congestion Management Agency. The Congestion Management Program (CMP) statute requires that uniform methods be used for evaluating transportation impacts of land use decisions on the CMP System. Furthermore, the statute allows the agency responsible for the CMP to choose the analysis methods.

This document presents VTA's guidelines for preparing Transportation Impact Analyses (TIAs) for CMP purposes. TIAs are prepared to assess the transportation impacts of land development projects and to assist in identifying improvements to minimize a development project's impacts. TIAs are prepared by local jurisdictions as part of environmental assessments completed for development proposals. These *Guidelines* are intended to be used by Member Agencies as part of their regular process of evaluating land use decisions and may be viewed as a minimum scope for assessing transportation impacts. Member Agencies may maintain their own guidelines that supplement the procedures in the *VTA TIA Guidelines*, and Member Agencies may also have a lower size threshold for when a transportation analysis must be prepared in their jurisdiction. Therefore, a TIA may not be required by the CMP but may be required by Member Agencies.

The *VTA TIA Guidelines* are intended for transportation analysis related to land development projects. The *VTA TIA Guidelines* may be used as a reference point for the analysis of transportation improvement projects, subject to the judgment of the Lead Agency.

It is not intended that TIAs following the *VTA CMP TIA Guidelines* will provide all information required for California Environmental Quality Act (CEQA) purposes. VTA encourages Member Agencies to include any other pertinent information not outlined in the *VTA TIA Guidelines* to identify environmental impacts.

Finally, VTA encourages the development of transit-friendly, pedestrian-friendly, and bicyclist-friendly land use projects. In particular, projects in Cores, Corridors or Station Areas as defined in the VTA Community Design and Transportation (CDT) Program *Manual of Best Practices for Integrating Transportation and Land Use* are encouraged to follow CDT Program best practices.

### 1.1 Background

The *TIA Guidelines* were originally included in Santa Clara County's 1991 Congestion Management Program (CMP). In 1993, the CMP technical documents, including the *VTA TIA Guidelines*, were published in a document titled *Technical Standards and Procedures for the Santa Clara County Congestion Management Program*. Since then, the *VTA TIA Guidelines* has been subsequently updated.

This document supersedes the 2009 *TIA Guidelines* and includes the following sections:

Part I: Statute and Authority

Chapter 1. CMP Statute and Intent of VTA *TIA Guidelines*

Chapter 2. TIA Scoping

Part II: Notification and Review

Chapter 3. TIA Notification, Preparation and Review Process

Part III: TIA Contents and Methodology

Chapter 4. Recommended TIA Table of Contents

Chapter 5. Analysis Periods and Methodologies

Chapter 6. Existing Conditions

Chapter 7. Background Conditions

Chapter 8. Trip Generation and Auto Trip Reductions

Chapter 9. Project Conditions and Impacts/Effects

Chapter 10. Mitigation Measures and Multimodal Improvements

Chapter 11. Future Year Scenarios (Cumulative Conditions)

Part IV: Other Considerations

Chapter 12. Special Project Types

## **1.2 Definition of Transportation Impact Analysis**

Transportation Impact Analysis (TIA) is the term used for the study of the expected effects of development projects on transportation facilities. The TIA's purpose is to determine whether the transportation system can accommodate the activity generated by the proposed development project and if improvements are needed to the roadways, bicycle and pedestrian facilities, and transit services and facilities affected by the project. TIA Reports are also intended to assist in identifying improvements to minimize a development project's transportation impacts, which may include reducing the number of automobile trips the project generates. This documentation helps decision makers determine whether to approve the project and what conditions to impose on the project.

## **1.3 Legislative Requirement**

California's CMP statute requires that all CMAs develop a uniform program for evaluating the transportation impacts of land use decisions on the designated CMP System. Specifically, CMP Statute requires:

*A program to analyze the impacts of land use decisions made by local jurisdictions on the regional transportation systems, including an estimate of the costs associated with mitigating those impacts. [California Government Code: 65089 (b) (4).]*

The *TIA Guidelines* are designed to meet the requirement for a uniform land use impact analysis program in the CMP Statute.

In order to conform with the CMP, Member Agencies must follow the methodologies described in this document to evaluate the transportation impacts of development projects on the CMP System.

In addition, as part of the CMP Land Use Impact Analysis Program, all Member Agencies are required to forward a summary of land use changes and their transportation impacts to VTA on an annual basis. The purpose of collecting land use data on an annual basis is to ensure that development projects that do not meet the threshold for preparing a TIA are evaluated in the CMP process. This land use data will be incorporated into the countywide transportation model maintained by VTA and will be used to monitor conformance with the CMP. Please see the latest version of VTA's *CMP Annual Monitoring and Conformance Requirements*, for more information on land use monitoring.

#### **1.4 CMP Transportation Impact Analysis Requirements**

Member Agencies must follow the methodologies presented in this document to prepare TIAs for land use decisions that impact the CMP System. In order to conform with the CMP, Member Agencies must do the following:

1. Use the VTA *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 net new weekday (AM or PM peak hour) or weekend peak hour trips, including both inbound and outbound trips.
2. Submit a copy of the TIA Report to VTA at least 20 calendar days before the development decision or recommendation is scheduled by the Member Agency.

**Section 2.1** contains further information about when a TIA must be completed. **Sections 3.1, 3.2** and **3.3** detail the responsibilities of the Member Agency and VTA in meeting the CMP TIA requirements.

#### **1.5 Benefits of CMP Transportation Impact Analysis Guidelines**

The most significant benefit of these Guidelines is that they promote the use of uniform procedures for performing TIAs and evaluating land use decisions on CMP facilities in Santa Clara County. The use of these common procedures helps ensure that the performance of the CMP transportation system is not adversely affected by land use decisions, and that opportunities to minimize impacts and improve the transportation system are identified. Moreover, the use of a common set of Guidelines allows each Member Agency to understand the impacts of development projects in other jurisdictions. Furthermore, it allows a Member Agency to request mitigation measures on its transportation facilities as a result of a project under development in another jurisdiction.

The use of a standard set of TIA guidelines is the first step in developing stronger linkages between transportation and land use planning, which is a goal of VTA.

## 1.6 Exemption Process

Portions of the *TIA Guidelines* described in this document may need to be modified for use in analyzing the impacts of a specific situation. The following process should be used in order to obtain approval for modifying the requirements of the Guidelines contained herein:

1. The Member Agency should contact VTA requesting modification of a specific *TIA Guidelines* requirement for a project.<sup>1</sup> The Member Agency should provide the reasons for the request(s). VTA staff will take action on the request if the request requires immediate action and is of a nature to not require action by VTA Committees.
2. If action cannot be taken by VTA staff, the VTA Technical Advisory Committee (TAC), with input from the Systems Operations & Management (SOM) and Land Use / Transportation Integration (LUTI) Working Groups, will review the request and recommend an action to the VTA Board.
3. The VTA Board will review the TAC's recommendation(s) and take action.

## 1.7 CMP Technical Standards and Procedures Amendment Process

The VTA *TIA Guidelines* are part of the *Technical Standards and Procedures for the Santa Clara County Congestion Management Program* (referred to throughout this document as the *Technical Standards and Procedures*). The most recent versions of the *Technical Standards and Procedures*, including the *TIA Guidelines*, are posted on the VTA website. The intent is to update the *Technical Standards and Procedures* on a regular basis by providing revisions where appropriate.

Technical Update Memos may be prepared periodically to address technical questions regarding standards and procedures as these questions are raised by Member Agencies. Technical Update Memos are divided into two categories, each having its own approval process, as described below:

1. Memos with New or Revised Requirements: These memos are to be prepared by VTA staff, reviewed by the SOM and LUTI Working Groups and TAC, and approved by the VTA Board.
2. Memos with Clarifications or Additional Information: These memos are to be prepared by VTA staff, and received by the SOM and LUTI Working Groups and TAC.

Once adopted or received, these technical update memos have precedence over or clarify previously adopted procedures. Technical update memos are to be posted on the VTA website and emailed to all members of the VTA TAC, SOM Working Group, and LUTI Working Group.

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<sup>1</sup> Modifications to VTA *TIA Guidelines* regarding the following aspects of a project's analysis do not require CMP action: trip generation rates, trip distribution/assignment, and default values used in the Auto Level of Service analysis. However, these modifications should be clearly documented in the TIA. Documentation should include source and comparison with values or procedures specified in the VTA *TIA Guidelines*.

The VTA *TIA Guidelines* must be reviewed and revised on a regular basis to incorporate all technical update memos adopted since the last revision and to address new policy direction adopted by the VTA Board. With VTA Board approval the revised *TIA Guidelines* shall be distributed to Member Agencies for incorporation into the *Technical Standards and Procedures*.

## **1.8 Local Transportation Model Consistency**

If travel demand forecasting models are used to evaluate transportation impacts of land use decisions, they must be consistent with the VTA Countywide Transportation Model. VTA has developed procedures for Member Agencies to use in developing consistent models. These procedures are described in the *Local Transportation Model Consistency Guidelines* of the *Technical Standards and Procedures*.

## **1.9 Document Conventions**

Throughout this document, certain conventions are used, which are listed below. In addition to these document conventions, a Glossary with definitions of key terms is provided at the end of the document.

1. The acronym “TIA” is used throughout this document to indicate Transportation Impact Analysis.
2. Unless explicitly identified, all references to documents in these VTA *TIA Guidelines* shall mean the most recent version of the document published.
3. In this document, the word “should” is used to indicate a recommended action. The words “shall” or “must” are used to indicate required actions.
4. The word “facility” is used generally in this document to refer to CMP System roadway facilities, which include CMP intersections, freeways, and rural highways. CMP facilities also include the CMP Transit Network and the CMP Bicycle Network, but these are generally called out specifically in the text.
5. The agency responsible for preparing the TIA is referred to in this document as the “Lead Agency.”

## Chapter 2. TIA Scoping

This section provides direction on the scoping of TIA studies. The Lead Agency is responsible for scoping the TIA, with input from VTA and other agencies through the process described in *Chapter 3*. The description of TIA scoping focuses on three areas:

1. Determining when and if a TIA needs to be completed;
2. Determining roadway facilities to be included in the analysis;
3. Determining other transportation issues to assess.

### 2.1 When Must a TIA be Completed?

The **Trip Threshold** for when a TIA must be completed is the following:

A complete TIA for CMP Purposes shall be performed for any project in Santa Clara County expected to generate 100 or more net new weekday (AM or PM peak hour) or weekend peak hour trips, including both inbound and outbound trips.

The following are points that expand or provide detail on the above statement:

1. **Net New Peak Hour Trip:** Net new peak hour trips are defined as those proposed project trips not associated with an existing development on the site and not included in an approved project. If the proposed project involves a vacant or underutilized site with development rights, the number of net new trips that count towards the Trip Threshold are the proposed project trips minus the trips originally associated with the prior development. If the proposed project involves a vacant or underutilized site without development rights, all project trips are considered net new trips and count towards the Trip Threshold. Discounting of trips from existing or entitled development on the project site is subject to Lead Agency discretion. The Lead Agency may always take a more conservative approach than the one outlined in this document. For further guidance on trips from vacant or underutilized development, refer to item 7, below and *Section 7.2*.
2. **Pass-by and Diverted Linked Trips:** The number of pass-by and diverted linked trips of the proposed project shall not be used to reduce the number of new peak hour trips for determining whether a TIA is to be completed except for the following uses:
  - Gas stations;
  - Fast food restaurants; and
  - Stand-alone mini-markets.

For these uses, if the pass-by trip reduction results in less than 100 net new weekday peak hour trips, a TIA is not required. However, an operational analysis of the adjacent CMP facilities should be conducted with input from VTA staff. This analysis should be submitted to VTA.

3. **Trip Reductions:** The application of trip reductions (as described in *Chapter 8, Trip Generation and Auto Trip Reductions*) shall not be used to reduce the number of new peak hour trips for determining whether a TIA is to be completed.
4. **Special Events:** Special events that do not require issuance of a discretionary permit or environmental review do not require a TIA. For example, holding a one-day “Harvest Festival” in a downtown area would not require a TIA, while building a theater for use on an irregular basis would require a TIA.
5. **Addition to Existing Development Project:** A TIA must be completed for an addition to an existing development when the addition is projected to generate 100 or more net new AM or PM peak hour trips.
6. **Revision to Approved Unbuilt Development Project:** A TIA must be completed for an approved but unbuilt development that originally was not projected to generate 100 or more net new weekday peak hour trips, if the development is revised so that it is projected to generate 100 or more net new peak hour trips.
7. **Re-Occupancy of Vacant or Underutilized Development:** Generally, Member Agencies will not require a new TIA to be conducted for the re-occupancy of vacant or underutilized buildings or developments unless a discretionary permit is required from the jurisdiction. A vacant or underutilized building is generally understood to have development entitlement. Two situations are described below that note whether a TIA is required:
  - a. **Same Land Use:** A new tenant on a site who is planning to use the site *for the same use (i.e., the land use designation for trip generation calculation purposes would not change)* may not need to conduct a new TIA. For example, if the tenant improvements necessary to re-occupy the site do not require discretionary permits, a TIA is not required by VTA (though a TIA may be required by the Member Agency). However, if the tenant improvements require a discretionary permit and the project produces net new trips that meet or exceed 100 during the peak hour, a TIA is required.
  - b. **Change of Land Use:** A new tenant occupying a vacant development or building who is *changing the original use (and, therefore, the site's trip generation characteristics)* may need to conduct a new TIA. If the change of use requires a discretionary permit and the number of net new trips during a peak hour meets or exceeds 100, a TIA is required. If the new land use is expected to generate significantly different travel patterns from the previous use (e.g. conversion from employment to residential), based on engineering judgment, net new trips may be calculated without subtracting all trips associated with the prior development.

See **Section 7.2** for analysis approach for projects involving vacant and underutilized developments.

8. **General Plan Amendment:** General Plan Amendments (GPAs) may be of several types depending upon the jurisdiction and the specific situation. If the GPA approval grants an entitlement to build a specific development project (or allows approval of a project in the future as a right, or through a ministerial act) then a TIA must be completed for the GPA. Conversely, if the GPA does not grant an entitlement, then no TIA is required until a specific project application is considered by the Lead Agency.

A TIA is not required for a GPA when:

- a. The GPA grants no specific project entitlement;
- b. The GPA is prepared for a citywide plan; or
- c. The GPA is submitted with an entitlement for a specific project, but that project is not expected to generate 100 or more net new peak hour trips.

As long as a transportation analysis is being completed, VTA recommends that the analysis be consistent with the *TIA Guidelines* to the extent possible. Please refer to **Section 11.3, Long-Term General Planning Efforts**, for details.

9. **Special Project Types:** For further guidance on large or unique projects; projects on the jurisdiction border; multi-agency projects; projects generating large numbers of pedestrian, bicycle or transit trips; or large projects or plans involving more extensive transit delay analysis, see **Chapter 12**.
10. **Conformance Exemptions:** Some types of projects and situations are statutorily exempt from conforming with the CMP Auto Level of Service (LOS) standard. If this is the case for the project under consideration, a TIA must still be completed, but the particular exemption should be identified in the TIA Report.

The types of projects and situations exempted from the CMP Auto Level of Service standards are described in California Government Code Section 65089.44(b). For complete information on how these exemptions is to be addressed in a TIA, see the VTA *Traffic Level of Service Analysis Guidelines*.

Although these projects or situations are exempt from the CMP Auto Level of Service standard, these exemptions do not apply to the CEQA process. For example, the effects of freeway ramp metering on Auto Level of Service are exempt from the CMP standards; however, the effects of freeway ramp metering should be reflected in evaluating impacts under CEQA to properly address mitigation.

## 2.2 Which Roadway Facilities Should be Included in a TIA?

The Lead Agency is responsible for determining which CMP roadway facilities should be included in a TIA. The remainder of this section describes procedures for determining inclusion of intersections, freeway segments and rural highway segments on the CMP roadway network in a TIA.

### 2.2.1 Intersections

A CMP intersection shall be included in a TIA if it meets any one of the following conditions:

1. The proposed development project is expected to add 10 or more peak hour vehicles per lane to any intersection movement;
2. The intersection is adjacent to the project;
3. Based on engineering judgment, Lead Agency staff determines that the intersection should be included in the analysis.

Study intersections should be selected without consideration for jurisdictional boundaries. The 10 or more vehicles per lane requirement applies to any intersection movement (left turn, through or right turn). If a movement uses a shared lane, the shared lane shall be considered a full lane for these calculation purposes. For example, 40 new left turns in two lanes (one left turn lane and one shared left-through lane) should be calculated as 20 vehicles per lane. It should be remembered that this calculation is only intended for determining inclusion of an intersection in a TIA. The allocation of new trips to travel lanes for operational analysis purposes could be quite different from this equal allocation of trips to the travel lanes.

### 2.2.2 Freeway Segments

A freeway segment shall be included in a TIA if it meets any one of the following conditions:

1. The proposed development project is expected to add traffic equal to or greater than one percent of the freeway segment's capacity. The TIA must provide a tabulation, as shown in **Appendix A** (*Table A-1: Sample of Freeway Analysis Requirement Determination*), to show that freeway segments have been assessed to determine if freeway analysis is required, even in the case where it is determined that no freeway segments meet the one percent threshold, or include text indicating that this assessment has been conducted;
2. The proposed development project is adjacent to one of the freeway segment's access or egress points;
3. Based on engineering judgment, Lead Agency staff determines that the freeway segment should be included in the analysis.

The freeway segments analyzed in a TIA shall correspond to the segments included in the latest VTA CMP Monitoring and Conformance Report, which also correspond to Caltrans segment definitions.

For calculating the amount of added traffic compared to freeway segment capacity, the capacities cited in *Highway Capacity Manual 2000 (HCM 2000)* 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.

### 2.2.3 Rural Highway Segments

A rural highway segment shall be included in a TIA if it meets any one of the following conditions:

1. The proposed development project is expected to add traffic equal to or greater than one percent of the rural highway segment's capacity;
2. The rural highway segment is adjacent to the project;
3. Based on engineering judgment, Lead Agency staff determines that the rural highway segment should be included in the analysis.

For calculating the amount of added traffic based on rural highway segment capacity, the capacities cited in *HCM 2000* shall be used. For two-lane highways, the capacity shall be 1,700 vph for each direction of travel. For four-lane highways, the capacity shall be 2,200 vphpl. For special conditions, refer to Chapter 20 of *HCM 2000* for guidance.

### 2.2.4 Determining Other Transportation Issues to Address

In addition to an Auto Level of Service (LOS) analysis covering the facilities identified in **Section 2.2**, the TIA shall include an analysis of auto trip reductions; transit, bicycle and pedestrian conditions; project access and circulation; and other issues identified in **Chapters 6, 7, 8 and 9** of these Guidelines. In addition, the TIA may also include an analysis of other issues as determined by the Lead Agency. These analyses are not required for CMP purposes but may be included in a TIA to address local requirements or CEQA, and may include:

- Adequacy of automobile parking supply compared to demand or local standards;
- Queuing on local (non-CMP) facilities;
- Existing Plus Project analysis scenario (see **Chapter 4, Recommended TIA Table of Contents**).

The Lead Agency may require that additional scenarios be analyzed in the TIA. For example, unfunded transportation facility improvements may be evaluated as part of an additional scenario. Phased projects may also require additional scenarios.

## PART II – NOTIFICATION AND REVIEW

### Chapter 3. TIA Notification, Preparation and Review Process

This chapter outlines the process for notifications regarding TIAs, the preparation of TIAs, and review of TIAs. The chapter begins with an overview of the process including a step-by-step summary and figure. This chapter also defines the roles of the Lead Agency and VTA by listing the key responsibilities of each in preparing or reviewing TIAs.

#### 3.1 Overview of Process

The following is an outline of the key steps in the TIA Notification, Preparation and Review Process. These steps are shown in *Figure 1*. Note that the term “Lead Agency” in this context refers to the agency responsible for preparing the TIA.

1. **Lead Agency Submits TIA Notification Form:** Lead Agencies are required to send notification that a TIA is being started to VTA, as well as to designated contacts for cities, towns, the County, and Caltrans as appropriate. The purpose of this notification is to inform interested agencies of the study and to allow them to comment on the scope of the analysis.

A sample of the **TIA Notification Form** is provided in *Appendix B*. A PDF version that may be electronically filled out will be posted on the VTA website. VTA is in the process of developing a web-based TIA Notification Form, which will be linked from the VTA website when available. The Lead Agency is encouraged to submit the draft work scope of the TIA along with the TIA Notification Form. Lead Agencies are encouraged to submit TIA Notification Forms and work scopes electronically rather than in hardcopy format wherever possible.

Comments from interested agencies on the TIA scoping must be received by the Lead Agency *within 15 calendar days* of notification mailing.

2. **Lead Agency Submits TIA with Hearing Date:** Upon completion of the study and *at least 20 calendar days before* the project is considered for approval (e.g., City Council or Board of Supervisors hearing) or is “recommended for approval” (e.g., Planning Commission meeting), the Lead Agency is required to submit the TIA Report to VTA, as well as to designated contacts for cities, towns, the County, and Caltrans as appropriate.

With the TIA submittal, the Lead Agency should indicate the expected hearing date for project approval or recommendation. Lead Agencies are encouraged to submit TIA Reports electronically (via an email with an attachment, or a link to the TIA location online) rather than in hardcopy format wherever possible. A draft version of the TIA may

also be submitted earlier in the process for preliminary feedback from VTA and other agencies.

VTA may grant exceptions to this submittal time frame. The Lead Agency must request the exemption to the submittal date *at least 25 calendar days prior* to the appropriate hearing dates.

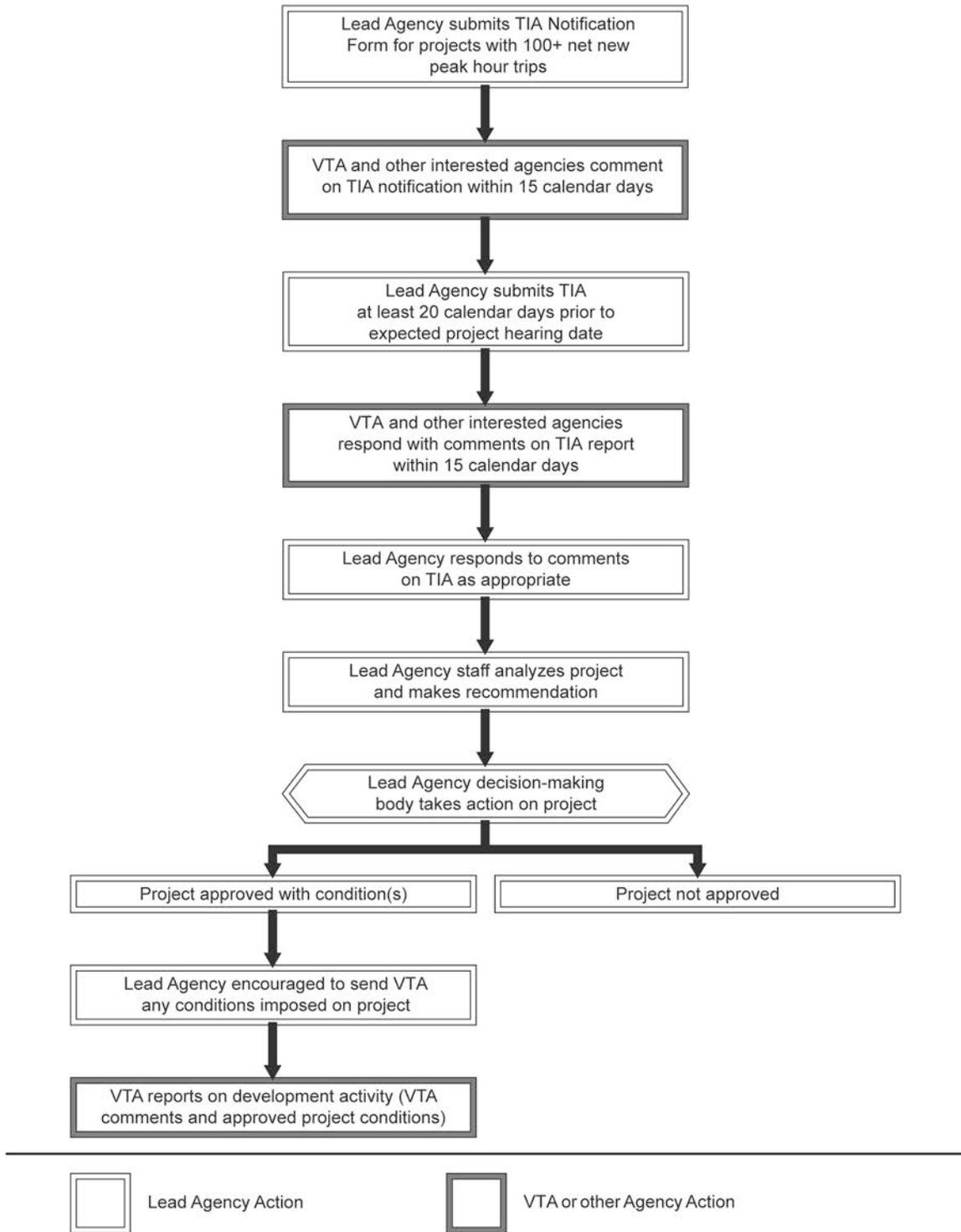
The deadline and process for TIA submittal are intended to apply to cases where the TIA is not submitted with an environmental document. When a TIA is submitted along with an environmental document following CEQA guidelines, the time frame provided by the CEQA process is considered to be sufficient.

- 3. VTA and Other Agencies Respond:** VTA will review the TIA for consistency with CMP standards and with VTA's *CDT Manual*. VTA will forward a response to the Lead Agency staff prior to action by the Planning Commission and/or City Council with copies sent to the jurisdiction's members on the VTA Technical Advisory Committee (TAC), Policy Advisory Committee (PAC) and TAC Working Groups, as appropriate. Other interested agencies may offer suggestions for the Lead Agency at this point as well. Comments from interested agencies on the TIA Report must be received by the Lead Agency *within 15 calendar days* of the TIA mailing.

The deadline and process for agency comments on TIAs are intended to apply to cases where the TIA is not submitted with an environmental document. When a TIA is submitted along with an environmental document following CEQA guidelines, the time frame provided by the CEQA process is considered to be sufficient.

- 4. Lead Agency Addresses Comments:** Upon receiving comments on the draft TIA Report from VTA or other agencies, the Lead Agency should address these comments. If an EIR is being prepared for the project, the Lead Agency shall respond in writing to comments on the TIA and transportation analysis if they are received through the CEQA comment process, pursuant to the requirements of CEQA. If an EIR is not being prepared, the Lead Agency should contact the agency that submitted comments to discuss them. For comments that address the compliance of the TIA with CMP requirements, the Lead Agency shall submit a written response to VTA and other agencies as appropriate. The response may take the form of a revised TIA, supplemental memo, or email clarification, as appropriate. For other comments not related to CMP compliance, the Lead Agency is encouraged to respond to VTA and other agencies.

**Figure 1: TIA Notification and Review Process**



5. **Lead Agency Decision and Project Conditions:** The Lead Agency staff analyzes the project and makes recommendations to the appropriate decision-making body (Planning Commission, City Council and/or County Board of Supervisors). The decision-making body takes action on the project. If the decision-making body rejects the project, no further action by the Lead Agency is required. If the project is modified substantially so that a new TIA is required, the Lead Agency must complete the TIA process again, beginning with TIA notification. If the project is approved, the Lead Agency is encouraged to send text of the relevant adopted conditions relating to the CMP Transportation System and the promotion of alternative transportation modes to VTA.
6. **VTA Reports on Development Activity:** VTA will prepare regular reports summarizing relevant VTA comments on projects reviewed by VTA, and relevant conditions on projects approved by Member Agencies that improve CMP facilities, relate to alternative transportation modes, and/or meet other goals such as those related to VTA's CDT Program. The report is typically presented on a quarterly basis to the VTA Board, the Congestion Management Program and Planning (CMPP) Committee, and the Technical, Citizen, Bicycle and Pedestrian, and Policy Advisory Committees (TAC, CAC, BPAC and PAC), and TAC Working Groups. VTA will also report on Member Agency compliance with CMP requirements through the CMP Monitoring and Conformance Program.

### 3.2 Key Lead Agency Responsibilities

1. The agency that is responsible for certifying the project's CEQA environmental document shall be responsible for performing the TIA.
2. The Lead Agency is responsible for notifying all appropriate jurisdictions that a TIA is being prepared by submitting a **TIA Notification Form** to all appropriate jurisdictions.
3. The Lead Agency is responsible for providing direction on the TIA study scope including:
  - a. Determining roadway facilities to be included in analysis (following the procedure set forth in **Section 2.2** in these Guidelines);
  - b. Defining analysis scenarios (following the procedures outlined in **Chapters 4** and **5** of these Guidelines);
  - c. Determining the proper analysis method to use in a study when more than one approach is possible.
4. The Lead Agency is responsible for preparing and submitting the TIA Report that meets all the requirements included in these Guidelines to VTA within the time frame outlined in **Section 3.1** of these Guidelines.

5. The Lead Agency is responsible for addressing comments on the draft TIA Report as described in *Section 3.1*. The Lead Agency is encouraged to consult with VTA in preparing any Conditions of Approval that relate to improving CMP facilities and promoting alternative transportation modes.
6. After project approval, the Lead Agency is encouraged to send to VTA any adopted Conditions of Approval that relate to improving CMP facilities and promoting alternative transportation modes.

### **3.3 VTA Review for Conformance**

VTA shall review TIA Reports for consistency with the *TIA Guidelines*. This review shall not constitute approval or disapproval of the project that is the subject of the report. VTA does not have the authority to approve or reject projects; that decision rests with the Lead Agency. However, VTA may provide comments to the Lead Agency on the TIA Report based on staff review. When appropriate, Lead Agency staff should discuss these comments with the preparer of the TIA Report to insure that future TIAs comply with CMP requirements. VTA will monitor the final project TIA Reports to ensure that they are consistent with CMP standards.

VTA will prepare regular reports of projects that were approved through the TIA process. These reports will summarize adopted conditions that improve CMP facilities and relate to alternative transportation modes, and will be presented to the VTA Board and its committees as described earlier in this chapter.

## PART III – TIA CONTENTS AND METHODOLOGY

### Chapter 4. Recommended TIA Table of Contents

This chapter presents a recommended outline and organization of a TIA. For more detailed guidelines, the chapter is noted where the guidelines are further discussed.

#### 1. Executive Summary

The executive summary should summarize major findings from the TIA. At a minimum, topics covered should include:

- Project Description;
- Existing Conditions;
- Brief summary of project trip generation and auto trip reductions, including Auto Trip Reduction Statement – *See Appendix C*;
- Project impacts/effects and proposed mitigation measures/improvements.

#### 2. Project Description, Study Area and Analysis Parameters

This section should provide a description of the project, the transportation context surrounding it and the parameters of the transportation analysis. Topics covered should include:

- Location of Proposed Project;
- Proposed Land Use and Project Size;
- Site Plan, indicating buildings, vehicular access, and pedestrian and bicycle accommodations – *See Section 9.4, Project Access and Circulation*;
- Study Intersections and Freeway Segments – *See Chapters 2 and 5*;
- Analysis Periods and Methodologies – *See Chapter 5*;
- Analysis Scenarios – *See this chapter and Chapter 11, Future Year Scenarios (Cumulative Conditions)*.

#### 3. Existing Conditions

This study scenario shall evaluate existing conditions. Topics in this section should include:

- Roadway Network;
- Existing Transit System;
- Existing Bicycle and Pedestrian Facilities and TDM Programs;
- Existing Volumes and Lane Configurations;
- Existing Intersection Auto Level of Service;
- Existing Freeway Segment Auto Level of Service;
- Field Observations.

See *Chapter 6* for more information on what is required in the existing conditions section.

#### **4. Trip Generation and Auto Trip Reductions**

This section shall document the methods used in the TIA for estimating trip generation associated with a project, approaches for reducing automobile trips to and from the project and documenting these reductions in a TIA Report, and assumptions about how trips are distributed throughout the transportation network.

Topics covered in this section should include:

- Trip Generation;
- Auto Trip Reductions and Transportation Demand Management;
- Trip Distribution and Assignment;
- Pass-by Trips and Diverted Linked Trips.

See *Chapter 8* for more information on these topics.

#### **5. Optional: Existing Plus Project Conditions**

This study scenario typically evaluates the addition of the project, along with estimated project-generated trips, to the existing conditions. This section typically identifies project impacts on the surrounding transportation network, including an analysis of roadways, freeway segments, and queuing. For any impacts identified, mitigation measures are typically developed based on the results of this study scenario. If mitigation measures are proposed, then an analysis with the mitigations measures is typically conducted.

*Note: This scenario is not required for CMP purposes but may be included in a TIA to address local requirements or CEQA. However, Existing + Project freeway analysis is required for CMP purposes for all projects meeting freeway analysis requirement conditions. Please refer to Section 2.2.2 regarding analysis conditions and Section 5.2.8 regarding analysis methods.*

#### **6. Background Conditions (Existing + Approved Projects)**

This study scenario shall evaluate background conditions, based on the sum of existing trips and trips from approved developments in the area, along with any changes to roadways and intersections associated with approved development or other funded changes to the transportation network.

Topics covered in this section should include:

- Approved Development Projects;
- Secured Roadway/Intersection Improvements;
- Background Intersection Analysis and Auto LOS.

See *Chapter 7* for more information on how to conduct the Background Conditions analysis.

#### **7. Background Plus Project Conditions (Existing + Approved Projects + Project)**

This study scenario shall evaluate the addition of the project, along with estimated project-generated trips, to the background conditions. This section shall identify project impacts on the surrounding transportation network, including an analysis of roadways

and queuing. The Lead Agency is encouraged, but not required, to include an analysis of freeway segments under Background Plus Project Conditions. For any impacts identified, mitigation measures shall be developed based on the results of this study scenario. If mitigation measures are proposed, then an analysis with the mitigations measures shall be conducted.

See *Chapter 9* for more information on how to conduct the Project Conditions analysis.

#### **8. Multimodal Evaluation, Site Access and Circulation**

This section shall include an analysis of transit, bicycle and pedestrian modes under Plus Project Conditions (Existing, Background and/or Cumulative conditions with the addition of the project), if not included elsewhere in the TIA. In addition, this section shall include an analysis of project access and circulation.

See *Chapter 9* for more information on how to conduct this analysis.

#### **9. Future Year (Cumulative) Conditions**

This study scenario shall evaluate the addition of the project, along with estimated project-generated trips, to longer term conditions than those described under Background Plus Project conditions. In general, the Cumulative Conditions scenario is analyzed as the combination of Background Conditions (Existing Conditions + Approved Projects) + Expected Growth + Project. This section shall identify project impacts on the surrounding transportation network. For any impacts identified, mitigation measures shall be developed based on the results of this study scenario. The parameters of the Cumulative Conditions scenario should be clearly defined in the TIA. Cumulative scenarios can be near- or long-term, as follows:

- **Near-Term Cumulative Conditions:** This scenario is a near-term cumulative analysis scenario to be provided for each jurisdiction's planning and information purposes. The analysis shall include expected growth until the project is expected to be available for final occupancy;
- **Alternate Cumulative Conditions Analysis -** The Lead Agency may substitute an alternate Cumulative Conditions analysis for the near-term Cumulative Conditions analysis described above. For example, the long-term Cumulative Conditions analysis conducted as part of an environmental analysis may be provided in place of the near-term Cumulative Conditions analysis.

See *Chapter 11* for more information on Cumulative Scenario analysis.

## Chapter 5. Analysis Periods and Methodologies

This section describes the typical analysis parameters to be included in the TIA. The Lead Agency shall be responsible for defining the analysis periods and documenting the analysis methodologies in the TIA.

### 5.1 Analysis Period

The TIA shall include, at a minimum, an analysis of transportation conditions in the peak hours for which the project generates 100 or more net new trips. In other words:

- If the project is expected to generate 100 or more net new weekday trips during both the AM and PM peak hours, then both weekday peak hours must be analyzed;
- If the project is expected to generate 100 or more net new weekday AM peak-hour trips but less than 100 new weekday PM peak hour trips, then only the AM peak hour must be analyzed;
- If the project is expected to generate 100 or more net new weekday PM peak hour trips but less than 100 new weekday AM peak hour trips, only the PM peak hour must be analyzed.

The TIA Report must document the project's trip generation for both the weekday AM and PM peak periods to justify the peak period(s) analyzed in the TIA.

The Lead Agency may require that additional periods be analyzed, based on engineering judgment. For example, additional analysis of midday or weekend peak periods may be required.

### 5.2 Analysis Methodologies

This section describes analysis method requirements for the various types of CMP roadway facilities: arterials, intersections, freeways, and rural highways. This section also describes analysis methodologies for non-vehicular facilities, i.e. bicycle, pedestrian and transit facilities. Much of this information is also described in the VTA *Traffic Level of Service Analysis Guidelines*. This section also includes discussion about the use of the VTA travel demand forecast model and other local models.

A more detailed description of analysis requirements and thresholds for determination of Auto Level of Service (LOS) impacts are provided in **Chapter 9, Project Conditions and Impacts/Effects**.

#### 5.2.1 Urban Arterials

The analysis of CMP urban arterials, including County Expressways, is accomplished by evaluating designated intersections along the arterials. The analysis of these intersections is to be conducted following the guidelines and the default values for CMP intersection analysis in the latest Board-adopted VTA *Traffic Level of Service Analysis Guidelines*. Thresholds for determination of an impact are described in **Chapter 9**.

When conducting Auto LOS analysis on County Expressway and/or Caltrans intersections, the Lead Agency should consult with County and/or Caltrans staff to determine the appropriate actual signal timing information for the analysis. Lead Agencies are also encouraged to obtain appropriate actual signal timing information for local intersections with traffic-adaptive signal timing.

In certain situations, more detailed analysis may be needed than what can be provided using isolated intersection analysis software. In these cases, such as on corridors with coordinated or adaptive signal control, the Lead Agency may choose to conduct additional analysis using other software programs, such as microsimulation software for operational analysis, when appropriate.

### **5.2.2 Rural Highways**

The analysis of rural highways shall be based on the methodology described in latest Board-adopted VTA *Traffic Level of Service Analysis Guidelines*. The analysis is primarily segment-based, but in some cases, it may also be appropriate to evaluate adjacent rural highway intersections, as discussed in the VTA *Traffic Level of Service Analysis Guidelines*.

### **5.2.3 High Occupancy Vehicle Lanes**

In cases where roadways with High Occupancy Vehicle (HOV) lanes are analyzed and project trips are assigned to the HOV facility, HOV lane usage and impacts must be evaluated. The following applies to the evaluation of an HOV lane:

- Assignment of trips to an HOV lane shall be described and justified in the TIA Report;
- Operational analysis of an HOV lane (including analysis of impacts) shall be documented in the TIA Report;
- Auto Level of Service (LOS) analysis for an HOV lane should be performed according to VTA *Traffic Level of Service Analysis Guidelines*;
- Caltrans recommends maintaining LOS C operations on HOV facilities, which occurs at approximately 1,650 vphpl;<sup>2</sup>
- For County Expressway HOV lane capacity, the Lead Agency should consult with County staff to determine the saturation flow rate as it varies depending on the Expressway segment.

Refer to the latest CMP *Monitoring and Conformance Report* for existing performance data for freeway HOV lane segments. Consult with County staff for the latest Expressway HOV lane volumes, including volumes at Expressway intersections.

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<sup>2</sup> “The occupancy requirements for HOV facilities should be based on the following considerations: ... C. Maintaining a free flow condition, preferably LOS-C... For buffered or contiguous HOV facilities, Caltrans considers LOS-C occurs at approximately 1,650 vehicles per hour, less if there is significant bus volume or if there are physical constraints.” Caltrans, *High-Occupancy Vehicle Guidelines*, 2003 Edition, Section 2.5.

## 5.2.4 Express Lanes

In cases where roadways with Express Lanes are analyzed and project trips are assigned to the Express Lane facility, Express Lane usage and impacts must be evaluated. The following applies to the evaluation of an Express Lane:

- Assignment of trips: Lead Agency shall consult with VTA, and assignment shall be described and justified in the TIA Report;
- Operational analysis of an Express Lane (including analysis of impacts) shall be documented in the TIA Report;
- Auto LOS analysis for an Express Lane should use the following saturation flow rates: 1,650 vehicles per hour per lane (vphpl).<sup>3</sup>

The CMP *Monitoring and Conformance Report* includes performance data for freeway Express Lane segments.

## 5.2.5 Bicycle

A Quality of Service (QOS)-based methodology, such the one in the *Highway Capacity Manual 2010* (Chapters 16 – 18) or a similar methodology,<sup>4</sup> is encouraged for analysis of bicycle conditions. Bicycle QOS methodologies typically measure features of the physical environment that affect the comfort and safety of bicyclists from the user’s perspective, such as the presence of dedicated bicycle facilities (lanes, paths, etc.), intersection delay and exposure to automobile traffic. The TIA should include a description of the methodology being used as part of the analysis. See **Section 9.3** for more information on bicycle analysis requirements.

## 5.2.6 Pedestrian

A Quality of Service (QOS)-based methodology, such the one in the *Highway Capacity Manual 2010* (Chapters 16 – 18) or a similar methodology,<sup>5</sup> is encouraged for analysis of pedestrian conditions. Pedestrian QOS methodologies typically measure features of the physical environment that affect comfort and safety for pedestrians from the user’s perspective, such as lateral separation from traffic, crossing distance and delay, and presence of landscaped buffer or trees. The TIA should include a description of the methodology being used as part of the analysis. See **Section 9.3** for more information on pedestrian analysis requirements.

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<sup>3</sup> For Express Lanes, which function to provide a time savings over non-tolled lanes, the relevant performance measure is the maintenance of LOS C operations. Per Caltrans Guidelines (see footnote 2), this occurs at approximately 1,650 vphpl.

<sup>4</sup> Alternative QOS methodologies, including City of San Francisco’s Bicycle Environmental Quality Index, are described in **Appendix G**.

<sup>5</sup> Alternative QOS methodologies, including City of San Francisco’s Pedestrian Environmental Quality Index, are described in **Appendix G**.

### 5.2.7 Transit

The transit analysis shall consider the effects of the project on transit delay and transit access and facilities. See *Section 9.2* for more information on transit analysis requirements.

### 5.2.8 Freeway Segments

The analysis of freeway segments is to be conducted following the guidelines in the latest Board-adopted VTA *Traffic Level of Service Analysis Guidelines*. One criterion for assessing the impact of a development project on freeways is Auto Level of Service (LOS). As in the CMP Monitoring and Conformance Program, density is the parameter for determining Auto LOS for freeway segments in TIAs in Santa Clara County. The relationship between density, speed and flow rate (or traffic volume) is described as follows:

$$d = \frac{V}{N \times S} \quad (\text{Eqn. 1})$$

where: d = density (vehicles per mile per lane, vpmpl)  
V = peak hour volume (vehicles per hour, vph)  
N = number of travel lanes (lanes)  
S = average travel speed (miles per hour, mph)

A table of Freeway Auto LOS criteria based on density ranges is provided in the *Traffic Level of Service Analysis Guidelines*. For Existing Conditions, the number of lanes as well as performance data for freeway segments in Santa Clara County are included in the most recent *CMP Monitoring and Conformance Report* produced by VTA.

For the analysis of project conditions, the volume (V) used in the density calculation (Equation 1) is:

$$V = V_o + V_p \quad (\text{Eqn. 2})$$

where: V<sub>o</sub> = existing peak hour volume (vph)  
V<sub>p</sub> = peak hour project trips distributed on the freeway segment (vph)

The Lead Agency is encouraged, but not required, to include an analysis of freeway segments under Background Plus Project Conditions and Cumulative Conditions. The TIA should include a description of the methodology being used to forecast future traffic volumes on freeways, which could include use of a transportation model.

The TIA shall include freeway analysis table(s) identifying whether the project would have an impact on the freeway system. Tables for the freeway analysis determination and impact analysis should include detailed data such as project trips, density and speed. Sample tables are shown in *Appendix A (Table A-1: Sample of Freeway Analysis Requirement Determination and Table A-2: Sample of Freeway Analysis Summary)*.

### 5.3 Use of Transportation Models

Travel demand forecasting models may be used for long-term analysis of development projects, planning efforts or transportation facilities. The use of a forecasting model for a buildout scenario should only be used for a period of at least five years from the preparation of a TIA Notification Form. If the project were to be built entirely within five years, the “near-term” development approach discussed in *Section 11.1.1, Opening Year/Short-Term Analysis*, shall be used.

The long-term analysis may include the use of either the countywide transportation model or local transportation models as described below:

1. **Countywide Transportation Model:** The countywide transportation model developed and maintained by VTA may be used for transportation impact analyses. Use of this model may be appropriate for the long-term analyses of large projects and general planning efforts. The cost for this modeling may be borne by the Lead Agency on the work effort.
2. **Local Transportation Models:** In some cases, local sub-area transportation models are appropriate. Under the CMA statutes, VTA must approve any local sub-area transportation models used for TIAs. VTA has adopted guidelines for developing local land use transportation impact models that are designed to ensure that local models are consistent with the countywide model. These guidelines are documented in the *Local Transportation Model Consistency Guidelines* in the *Technical Standards and Procedures*.

## Chapter 6. Existing Conditions

The TIA Report shall include a description of the existing transportation system in the area affected by the project. The project area transportation system shall include all CMP system facilities affected by the project (see *Section 2.2, Which Roadway Facilities Should be Included in a TIA?*). The following section details the items that should be included in the description of roadways, transit, bicycle and pedestrian facilities, and other transportation elements.

### 6.1 Counts and Data Collection

Field data, including counts and field observations, will be needed in order to accurately assess existing conditions. The following are key points regarding data collection for TIA completion:

1. **Data for Existing Study Scenario Analysis:** Freeway and intersection data collected as part of VTA's CMP Monitoring and Conformance Program are available for use in all TIAs. When possible, these data from VTA shall be used in the TIA.
2. **Additional Data:** In some cases, additional data will need to be collected for a different time period or to more accurately reflect existing travel that differs from the most recent CMP Monitoring data. The study should not use traffic volume data more than two years old. The use of growth factors should be considered if the traffic volume data is older than one year. Other data collected as required by the Lead Agency shall be provided to VTA (as part of the TIA Report) so that VTA's database may be updated. Submittal of data electronically (i.e., in files that can be used with traffic analysis software) is encouraged, where feasible.
3. **Bicycle and Pedestrian Data:** The collection of pedestrian and bicycle counts is encouraged whenever new traffic volume counts are conducted.
4. **Field Data Collection Methodology:** Field data should be collected using procedures outlined in the most recent version of the Institute of Transportation Engineers (ITE) *Manual of Transportation Engineering Studies*, or in the most recent version of the Transportation Research Board's *Highway Capacity Manual*.
5. **Field Observations:** Field observations of traffic conditions, access points, intersection geometries, traffic signal operations, pedestrian and bicycle accommodations, transit facilities and access, and adjacent land uses should be conducted in the study area for the proposed project. The Lead Agency may also request additional information from the field. Field observations should be noted and may be used to refine or revise Auto Level of Service (LOS) calculations when there are discrepancies in the observed and calculated Auto LOS.

## 6.2 Description of Existing Roadways

The following information shall be provided for the project area's CMP Roadway System:

- a. Local/arterial roadway, County Expressway, and freeway network description and map; all County Expressway and freeway descriptions must include a description of High Occupancy Vehicle (HOV) facilities (including HOV lanes and ramp metering bypasses) and Express Lane facilities;
- b. Intersection geometry, traffic controls, and traffic signal timing parameters;
- c. Recent turning movement counts (*see Section 6.1, Counts and Data Collection*);
- d. Existing Auto Level of Service (LOS) evaluated using VTA-approved Auto LOS methodology and standard values (*see Chapter 5, Analysis Periods and Methodologies*). In most cases, the existing Auto LOS should be those presented in the latest *CMP Monitoring and Conformance Report*. However, counts may need to be taken to reflect a change in travel patterns since the last monitoring cycle;
- e. Existing locations of congested traffic conditions (as identified with assistance of Lead Agency staff and field observations). This information includes description of queues extending into the upstream intersection(s), queue "spill-back" in turn lanes, effects of ramp metering, and duration of congestion;
- f. Funded and planned roadway improvements.

It may be necessary to provide field measurements of delay and queuing to accurately reflect existing conditions. Field measurements could account for situations where the congestion is more than that represented by the calculated Auto LOS. Additional information gathered from field observations may also be included in the TIA.

## 6.3 Description of Existing Transit System

The following information shall be provided for the project area's transit system (the project area transit system shall be defined as transit routes within 2,000 feet of the project boundaries):

- a. Transit route description and map;
- b. Transit station/stop locations;
- c. Site access to major regional transit providers (BART, Caltrain, etc.);
- d. Transit hours of operation and headway information;
- e. Public or private shuttle services provided in the project area;
- f. Location of park-and-ride lots in project area;
- g. Planned transit facilities within the project area; determination of planned transit facilities or services should occur in consultation with VTA and other operators, as appropriate.

## 6.4 Description of Existing Bicycle and Pedestrian Facilities and TDM Programs

The following information shall be provided for the bicycle facilities within the project area:

- a. Existing bicycle paths, lanes, and routes as well as bicycle/pedestrian over and under crossings;

- b. Future planned or programmed bicycle improvements including, but not limited to, those facilities, routes, and programs in the Lead Agency's adopted Bicycle Plan, Pedestrian Plan, Trails Master Plan, and/or bicycle/circulation element of their General Plan, and in other agencies' plans (e.g., adjacent cities' Bicycle Plans or Pedestrian Plans, cross-county bicycle corridors in the VTA *Santa Clara Countywide Bicycle Plan*, Bay Trail Plan);
- c. A basic characterization of existing bicycling conditions in terms of safety, ease of access to the project site, and Quality of Service indicators, emphasizing gaps and deficiencies in the bicycle network near the site (e.g., missing bicycle lanes, narrow outside lanes);
- d. Map showing existing bicycle facilities within 2,500 feet of the project boundaries. This map should indicate bicycle paths, lanes, and routes as well as bicycle/pedestrian over and under crossings;
- e. The description and map of existing bicycle conditions should focus on the project street frontages and paths to major attractors such as transit facilities, schools, shops and services, and major residential developments.

The following information shall be provided for the project area's pedestrian facilities:

- a. Existing pedestrian facilities in project area including sidewalks, crosswalks and other crossing control devices (e.g. beacons, refuge islands, etc.), and other non-motorized connections and paths in project area;
- b. Future planned or programmed pedestrian improvements including, but not limited to, those facilities, improvements, and programs in Member Agencies' pedestrian elements and plans;
- c. A basic characterization of existing walking conditions in terms of safety and Quality of Service indicators such as tree barriers, landscape buffers, and sidewalk width, emphasizing gaps and deficiencies in the pedestrian network near the site (e.g., missing crosswalks, missing pedestrian signal heads/phases, inadequate Americans with Disabilities Act (ADA) accommodations);
- d. Map showing existing pedestrian facilities within 1,000 feet of the project boundaries. This map should indicate sidewalks (showing each side of a street), sidewalk gaps, crosswalks, other crossing control devices (e.g., beacons, refuge islands, etc.), and bicycle/pedestrian over and under crossings;
- e. The description and map of existing pedestrian conditions should focus on the project street frontages and paths to major attractors such as transit facilities, schools, shops and services, and major residential developments.

When applicable, the following information shall be provided on Transportation Demand Management (TDM) or unique transportation or land use plans affecting the project area:

- a. TDM ordinances in effect for the project site (reference to ordinance and key aspects affecting project is sufficient);
- b. TDM programs at an existing facility, in the case of a project that is an expansion or a relocation from a nearby facility.
- c. Other transportation plans or land use plans unique to the project area;

## **Chapter 7. Background Conditions**

This study scenario shall evaluate Background Conditions, based on the sum of existing trips and trips from approved developments in the area, along with any changes to roadways and intersections associated with approved development or other funded changes to the transportation network.

The following sections present additional information on estimated trips from approved development projects, appropriate transportation facility improvements to include in the analysis, and other considerations.

### **7.1 Approved Development Projects**

Approved projects include not yet completed or occupied projects that have undergone an approval process (i.e., been granted a land use entitlement). Approved projects may be projects within the Lead Agency's jurisdiction or a neighboring jurisdiction. Local jurisdictions are encouraged to maintain an inventory of "approved trips." This inventory would include anticipated intersection turning movement volumes from approved projects. This information is useful in ensuring consistency among TIAs in the analysis of Background and Cumulative Conditions.

### **7.2 Vacant or Underutilized Buildings**

If the proposed project involves a vacant or underutilized site with development rights, the number of trips originally associated with that development may be included in the Background Conditions. The background trips associated with the vacant or underutilized development should be estimated from driveway counts or trip generation rates, size, and land use type of the existing site. The "project trips" would be the additional trips generated by the redevelopment and/or re-occupancy of the site, i.e., the total number of trips generated by the proposed project minus the estimated background trips of the vacant or underutilized development. If the proposed project involves a vacant or underutilized site without development rights, all trips generated by the proposed project would be "project trips." The Lead Agency always has the discretion to consider trips associated with prior development rights to be project trips, rather than background trips.

### **7.3 Addition to Existing Development Project**

If the proposed project involves the addition of a new use or expansion of an existing use at the site of an existing development, the number of trips originally associated with that site would be included in the Background Conditions. The background trips associated with the existing development should be estimated from driveway counts or trip generation rates, size, and land use type of the existing site. The "project trips" would be the additional trips generated by the addition or expansion project.

#### **7.4 Transportation Facility Improvements**

The transportation network for Background Conditions shall include all funded transportation facility improvements expected to be completed within one year of the proposed development project's completion. With VTA approval, a Lead Agency may request inclusion of other funded improvements or other developer-conditioned improvements.

#### **7.5 Background Auto Level of Service Analysis**

Transportation system operations for Background Conditions should be analyzed in a manner consistent with the analysis presented under Existing Conditions and following the methodology in *Chapter 5, Analysis Periods and Methodologies*.

## Chapter 8. Trip Generation and Auto Trip Reductions

This chapter describes methods for estimating trip generation associated with a project; approaches for reducing automobile trips to and from the project and for documenting these reductions in a TIA Report; and assumptions about how trips are distributed throughout the transportation network.

### 8.1 Trip Generation

The TIA should clearly identify the source of each trip generation rate used in the transportation analysis.

#### 8.1.1 Sources and Methodologies

The Lead Agency may use trip generation rates from the most recent version of the Institute of Transportation Engineers' (ITE's) *Trip Generation Manual*, rates developed from local data, or rates developed using alternative trip generation methodologies.

For the most common land uses, numerous studies have been used in developing the ITE trip generation rates. In some cases, however, the published ITE trip generation rates are based on very limited data. There are at least four cases in which the Lead Agency should consider using alternative sources for trip generation rates:

- When *ITE data is insufficient* (e.g. small sample size, not statistically valid);
- When a project's *specific land use* is not covered by the ITE manual or is known to show trip generation characteristics that differ from the categories covered in the ITE manual;
- When the *land use context*, such as high-density infill or development adjacent to transit, is not addressed by the ITE manual;
- When the project includes a mix of land uses (*mixed-use development* type).

Lead Agencies may also develop trip generation rates based on local data specifically for use in the transportation impact analysis. If custom trip generation rates are developed, techniques in the ITE's *Manual of Transportation Engineering Studies* should be used. The local data used to develop a custom rate should either be included in the TIA or made readily available by the Lead Agency.

Trip generation rates from other methodologies may be used instead of ITE rates, where defensible and appropriate. Alternative methodologies include:

- SANDAG Traffic Generation Manual & Trip Generation for Smart Growth;
- City of San José Trip Generation Rates;
- MXD Model/SANDAG Model – US EPA;
- NCHRP 8-51 – Enhancing Internal Trip Capture Rate for Mixed-Use Development;
- Station Area Resident Survey – MTC;
- California Smart Growth Trip Generation Tool – Caltrans/UC Davis;
- Travel demand forecasting models;
- California Emissions Estimator Model (CalEEMod)<sup>6</sup>

Additional information on the research and professional practice basis of alternative trip generation methodologies can be found in *Appendix D*.

Professional judgment should always be used when selecting a trip generation data source or methodology. When using trip rates from any of the alternate trip generation methodologies listed, the Lead Agency shall include in the TIA Report a full description of the trip generation methodology used and a summary of all inputs and assumptions. Professional judgment should be exercised to avoid double counting when using an alternate trip generation methodology. Some methodologies already account for attributes contained in the Standard Trip Reductions, which should not be taken on top of reductions provided by an alternate methodology.

In cases where the chosen trip generation methodology is based on a limited sample size, Lead Agencies are encouraged to conduct additional research or use local data to validate the trip rates before applying the suggested trip reductions from the alternate methodology.

### **8.1.2 Documentation of Trip Rates**

A summary table showing trip generation for each type of land use in the project for each period of analysis (daily, AM peak, PM peak, etc.) shall be provided. The summary table shall include a quantification (square feet, number of units, etc.) upon which the trip generation calculation is based for each land use type, the trip generation rates used, and resulting generated trips.

The choice of trip generation rates shall be justified in the TIA. This includes any trip generation rate used for High Occupancy Vehicles.

Additionally, any unique project attributes affecting the trip generation calculations shall be documented. For example, assumptions regarding peak spreading and pass-by trips shall be documented.

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<sup>6</sup> CalEEMod is recommended for Vehicle Miles Traveled (VMT) analysis by the California Air Pollution Control Officers Association (CAPCOA) and the Bay Area Air Quality Management District (BAAQMD). CalEEMod may be useful as a supplemental resource for verification and justification of trip generation and trip reductions. However, since CalEEMod does not produce detailed trip generation estimates, it is not recommended that Lead Agencies rely on CalEEMod as their primary source for trip generation when preparing a TIA. See *Appendix D* for more detail.

### 8.1.3 Mode Split

For large projects that use a transportation model (either the countywide model or a local model), the Lead Agency is encouraged to prepare a summary table for either the daily or peak hour that indicates the number of vehicle trips, transit trips, bicycle trips and pedestrian trips generated for each type of land use. The Lead Agency may determine the project mode split based on factors from the VTA countywide model, in consultation with VTA. Based on engineering judgment, some projects may need further analysis of bicycle and pedestrian trips generated by the project. See *Chapter 12, Special Project Types*, for more information.

## 8.2 Automobile Trip Reductions and Transportation Demand Management

An important goal of VTA's CMP is to encourage development that reduces system wide traffic congestion and improves air quality in the region. Several strategies can be used to encourage this type of development and to accomplish these goals, including:

- Mixed-use development (which increases internal trips);
- A strong Transportation Demand Management (TDM) program (which provides incentives and services to encourage alternatives to the automobile);
- Project location and design features that encourage walking, bicycling and transit usage;
- Parking demand management programs, which discourage drive-alone trips; and
- Development near frequent transit services.

These strategies are most effective when combined into a comprehensive program that is integrated into the project's design and operation.

Implementation of one or more of these strategies will encourage reductions in automobile trips generated by new development projects compared to standard automobile-trip rates. Projects that incorporate these concepts into their design may be awarded trip reduction credits, which may be applied to the total number of trips generated by the project. Trip reduction credits are subject to Lead Agency approval and discretion.

This section outlines three approaches for developing automobile trip reductions for a TIA:

- **Standard Trip Reductions** are established percentage reductions based on research or local policy that are provided within the *TIA Guidelines*. They can be taken for projects which include a mix of land uses, are located near transit, and/or have certain programs for TDM;
- **Target-Based Reductions** may be taken when the project applicant has entered into an enforceable agreement with the Lead Agency that limits the number of automobile trips traveling to and from the project site. The trip reduction program must include a commitment to monitor trip generation and determine whether targets are met, an enforcement structure, and a commitment to summary-level data sharing;
- **Peer/Study-Based Trip Reductions** may be taken when studies of similar projects, or of other sites occupied by the project applicant, have demonstrated comparable trip reductions through survey results or other data. The trip reduction program must include a commitment to monitor trip generation, and a commitment to summary-level data sharing.

*All auto trip reductions must be clearly explained, documented, and justified in the project's TIA Report. Lead Agencies must state which of the above approaches is being used to develop auto trip reductions, if any reductions are claimed. Trip reductions shall be summarized in an Auto Trip Reduction Statement in the Executive Summary of the TIA Report, using the form provided in Appendix C.*

## **8.2.1 Standard Trip Reductions**

VTA has developed the following guidelines for estimating auto trip reductions due to mixed-use development (internal trips), certain TDM programs, and transit station proximity. These guidelines should be used to determine the standard reductions in project vehicle trip generation from the estimates produced using the trip generation sources and methodologies referred to in **Section 8.1.1**. It must be emphasized that the vehicle trip reduction values or percentages should be applied carefully using professional judgment. In some cases, following the guidelines for standard trip reductions outlined in this section would overestimate trip generation from the project. **Sections 8.2.2, Target-Based Trip Reductions, and 8.2.3, Peer/Study-Based Trip Reductions,** provide guidance for cases when trip reduction percentages are likely to be higher than those detailed in this section. These subsequent sections also provide the procedures for documenting and justifying larger trip reductions for “special circumstances” which are referred to in this section.

The effectiveness of mixed-use development, TDM programs, and location near transit at reducing project vehicle trip generation should be monitored by Lead Agencies as part of the CEQA mitigation measure monitoring process and/or the agency's TDM effectiveness monitoring program. Lead Agencies are encouraged to provide this type of monitoring data to VTA, when available, to assist in revising the vehicle trip reduction guidelines in the future. VTA will gather data on trip reduction experiences from Member Agencies through the CMP Monitoring and Conformance Program, and may share this data online to assist agencies in preparing TIAs.

### ***Table 1: Standard Auto Trip Reduction Rates***

summarizes the maximum trip reduction rates that can be applied under the Standard Trip Reduction Approach. It should be noted that standard vehicle-trip generation rates already include some measure of transit use, biking, walking and TDM programs, so trip reductions summarized in **Table 1** may be smaller than measured transit use and TDM program participation in a given project. The trip reduction values in this chapter may be revised as new information is gathered.

#### **8.2.1.1 Mixed-Use Developments**

The Standard Reduction approach allows the largest trip reductions (i.e., 10 to 15%) for mixed-use developments that combine retail uses with a housing or hotel component. Based on a review of mixed-use developments, other mixed-use projects will be allowed smaller trip reductions due to the reduced amount of internal trip-making found in these projects. **Table 1: Standard Auto Trip Reduction Rates** summarizes the maximum trip reductions for mixed-use developments under the Standard Reductions approach.

**Table 1: Standard Auto Trip Reduction Rates**

Trip Reduction Strategy	Standard Trip Reduction
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**Mixed-Use Development Project**

<i>with housing and retail components</i>	<i>15.0% off the smaller trip generator<sup>7</sup></i>
<i>with hotel and retail components</i>	<i>10.0% off the smaller trip generator<sup>8</sup></i>
<i>with housing and employment</i>	<i>3% off the smaller trip generator<sup>9</sup></i>
<i>with employment and employee-serving retail</i>	<i>3% off employment component<sup>10</sup></i>

**Effective TDM Program<sup>11</sup>**

<i>Financial Incentives</i>	<i>up to 5.0%<sup>12</sup></i>
<i>Shuttle Program<sup>13</sup></i>	
<i>- Project-funded dedicated shuttle</i>	<i>3.0%</i>
<i>- Partially-funded multi-site shuttle</i>	<i>2.0%</i>

**Location Within 2,000-Foot Walk of Transit Facility<sup>14</sup>**

<i>Housing near LRT, BRT or Caltrain station</i>	<i>9.0%*</i>
<i>Housing near a Major Bus Stop<sup>15</sup></i>	<i>2.0%*</i>
<i>Housing Near a BART station</i>	<i>Case-by-Case**</i>
<i>Employment near LRT, BRT or Caltrain Station</i>	<i>6.0%*</i>
<i>Employment near a Major Bus Stop<sup>16</sup></i>	<i>2.0%*</i>
<i>Employment Near a BART station</i>	<i>Case-by-Case**</i>

\* Note: The LRT/BRT/Caltrain Station, BART Station, and Major Bus Stop reductions cannot be combined.

\*\* Note: See **Section 8.2.1.3 Proximity to Transit (Rail or Major Bus Line)**, below, for a description of the case-by-case method for proximity to BART stations

<sup>7</sup> The proposed trip reductions calculated for all land uses within the development area shall be based on the land use that produces the least amount of new trips. In other words, the same trip reduction rate for the land use that produces the least number of new trips should be used to determine the trip reduction for all developments.

<sup>8</sup> Same as footnote 7.

<sup>9</sup> Same as footnote 7.

<sup>10</sup> All trips made to retail services (employee-serving retail) within the proposed development/complex may be considered internal trips. However, to qualify for this reduction, the employee-serving retail must be integrated into the employment complex and must not have a dedicated parking area.

<sup>11</sup> In order for a project applicant to claim a TDM reduction, a commitment to make the TDM program available to all current and future occupants of the development must be included in a legally enforceable document. See **Section 8.2.1.2, Transportation Demand Management (TDM) Program** for more details.

<sup>12</sup> Financial incentives must be offered on an ongoing basis and must be roughly equivalent to or higher than the monthly maximum pre-tax commuter benefit allowed under federal law at the time of TIA preparation in order for the project to receive full trip reduction. See **Section 8.2.1.2** for more details.

<sup>13</sup> If the shuttle trip reduction is being combined with the “Employment near LRT, BRT or Caltrain Station” reduction, the maximum shuttle trip reduction that can be taken is 1.5%.

<sup>14</sup> See **Section 8.2.1.3, Proximity to Transit (Rail or Major Bus Line)**, below, for further detail.

<sup>15</sup> A major bus stop is defined as a stop where six or more buses per hour from the same or different routes stop during the peak period in Core, Corridor or Station Areas.

<sup>16</sup> Same as footnote 15.

The following are further descriptions of the trip reduction categories listed in *Table 1*:

1. **Housing/Retail Mixed-Use Projects:** Mixed-use development projects that include a substantial housing component and a retail component can reduce vehicle trips by increasing internal trips. For example, project residents patronizing the retail uses would reduce the number of external retail and residential trips. Hence, a reduction in vehicle trips can be taken off the smaller trip generator of the project in an amount not to exceed fifteen percent (15%) unless special circumstances are justified in the project's TIA.<sup>17</sup> The trips generated by the larger trip generator should be reduced by no more than the same number of trips reduced for the smaller trip generator.
2. **Hotel/Retail Mixed-Use Projects:** Mixed-use projects combining hotel and retail components will also increase internal trips. Hotel guests patronizing the project's retail uses would reduce the number of external retail and hotel trips. A reduction on the trips generated by the smaller trip generator can be taken in an amount not to exceed ten percent (10%) unless special circumstances are justified in the project's TIA.<sup>18</sup> The trips generated by the larger trip generator should be reduced by no more than the same number of trips reduced for the smaller trip generator.
3. **Housing/Employment Mixed-Use Projects:** Mixed-use projects combining housing and employment components may have trips made between the two uses if some housing residents are also employed on-site. No more than a three percent (3%) reduction off the trips generated by the smaller of the two trip generators shall be taken unless special circumstances are justified in the project's TIA.<sup>19</sup> The trips generated by the larger trip generator should be reduced by no more than the same number of trips reduced for the smaller trip generator.
4. **Retail/Employment Mixed-Use Projects:** Mixed-use projects combining employment and employee-serving retail components, such as dry cleaning, gift store, and service-oriented uses offer opportunities for employees to run errands during the day that they may have otherwise done during a peak period. In order to qualify for a trip reduction, the employee-serving retail must be integrated into the employment complex, with no designated parking area for the retail. The TIA should document that the project is eligible for a reduction. No more than a three percent (3%) reduction off the trips generated by the employment site shall

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<sup>17</sup> This value is based on data cited in "Transit Oriented Development, Using Public Transit to Create More Accessible and Livable Neighborhoods" from the Victoria Transport Policy Institute, April 4, 2006; this value is comparable to Metropolitan Transportation Commission's *Characteristics of Rail and Ferry Station Area Residents in the San Francisco Bay Area: Evidence from the 2000 Bay Area Travel Survey (Volume I)*, September 2006.

<sup>18</sup> This value is based on VTA's review of mixed use literature available in 1998. Values for mixed-use trip reductions varied from 7% to 13%. See Institute of Transportation Engineers, *Trip Generation: An Informational Report, 5<sup>th</sup> Edition*, 1991, p, I-48 and California Air Resources Board, *Transportation-Related Land Use Strategies to Minimize Motor Vehicle Emissions: An Indirect Source Research Study*, June 1995, Appendix B.

<sup>19</sup> This value is based on Member Agency policies to encourage mixed-use development.

be taken unless special circumstances are justified in the project's TIA.<sup>20</sup> All of the employee-serving retail trips may be considered to be internal to the project.

### **8.2.1.2      *Transportation Demand Management (TDM) Program***

A reduction in project vehicle trip generation can be made for provision of a Transportation Demand Management (TDM) program. In the VTA *TIA Guidelines*, reductions for certain TDM programs may be taken through the Standard Trip Reduction approach below. It should be understood that most trip generation rates include a certain ambient level of non-single occupant vehicle trips. Therefore, the actual effectiveness of the TDM program is assumed to be greater than the values listed below, but the maximum trip reduction that may be taken from trip generation rates must comply with the guidelines below, for TIAs that take the Standard Trip Reductions approach.

In order for a project applicant to claim a TDM reduction in a TIA, a commitment to make the TDM program available to all current and future occupants of the development must be included in a legally enforceable document. Examples of such documents, for trip reduction documentation purposes, include Conditions of Approval, Development Agreements, CEQA Mitigation Monitoring & Reporting Programs (MMRPs), and/or Covenants, Conditions, & Restrictions (CC&Rs). The commitment to participate in a TDM program must be documented in the TIA.

VTA offers Standard Trip Reduction values for two types of TDM programs:

1. **Financial Incentives:** TDM programs that are based on financial incentives have the greatest effect on reducing trip generation. Trip reductions can be taken for projects which include the following types of financial incentives: transportation allowance for alternative modes to driving alone; parking cash-out; pre-tax commuter benefits for biking, carpooling, vanpooling, and using transit; and subsidies such as free transit passes or transit fare incentives provided by employers and/or residential complexes. In addition, charging for parking is a financial disincentive for solo driving and is considered a TDM measure. The maximum trip reduction that can be taken for such TDM programs is five percent-(5%) unless special circumstances are justified in the project's TIA.<sup>21</sup>

The actual trip reduction that can be used in the TIA will depend on the level of financial subsidy provided to residents and/or employees and the number of residents and/or employees eligible for the subsidy. The standard 5% reduction can be taken if the financial subsidy is offered to all residents and/or employees of the development on an ongoing basis and is roughly equivalent to or higher than the monthly maximum pre-tax commuter benefit allowed under federal law at the time of TIA preparation.

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<sup>20</sup> This value is based on Member Agency policies to encourage mixed-use development.

<sup>21</sup> This figure is based on two sources: US Department of Transportation, "The Effects of Land Use and Travel Demand Management Strategies on Commuting Behavior," November, 1994, which indicated a reduction in Drive Alone mode of approximately 5% for sites providing financial incentives; and Donald Shoup, "Parking Cash Out," Chicago: Planning Advisory Service, 2005, indicating reductions in vehicle trips of at least 5% at employers offering parking cash-out.

The level of financial incentives to be provided must be documented in the TIA Report.

2. **Shuttle Programs:** Projects which participate in shuttle programs linking the site to major transit facilities or other locations with high employee densities will be allowed a three percent (3%) trip reduction unless special circumstances are justified in the project's TIA.<sup>22</sup> The full 3% trip reduction may be taken only when the project is committed to fully funding a dedicated shuttle to light rail, Caltrain, or BART facilities or other locations with high employee densities. A 2% reduction may be taken if the project is committed to partially funding a shuttle that serves other sites in addition to the project site. If the shuttle trip reduction is being combined with the 'Employment near LRT, BRT or Caltrain Station' reduction, the maximum shuttle trip reduction that can be taken is one and one-half percent (1.5%).

### **8.2.1.3 Proximity to Transit (Rail or Major Bus Line)**

Housing and employment projects that are located near transit have different mode splits resulting in generally lower vehicle-trip generation characteristics. The extent is different for different types of transit facilities. To qualify for the Proximity to Transit trip reduction rates, developments must be located near existing or future Light Rail Transit (LRT) stations, Caltrain stations, BART stations, Bus Rapid Transit (BRT) stations, or major bus stops. For a project to qualify for an auto trip reduction near a future transit station, the transit capital project that will include the station must be under construction at the time of the TIA Notification Form issuance. A major bus stop for the purposes of trip reductions is defined as a stop where six or more buses per hour (from the same or different routes) stop during the peak period. A development qualifies as being located near transit if the project entrance (housing front door, office pedestrian entrance) and greatest density of the project are within approximately 2,000-foot walking distance of the specified transit facility.

Projects that take any of the trip reductions described in this section shall provide a map or text description indicating the walking route from the project to the transit stop. The TIA should identify any pedestrian barriers that affect access from the development to the transit facility, including gaps in the sidewalk network and/or street crossings that lack pedestrian crossing facilities. If any pedestrian barriers as described above exist in the route between the project site and the transit stop, the project would be disqualified from taking a trip reduction for proximity to transit unless the project commits to fully funding any improvements needed to close the gap.

It is recognized that the 2,000 foot walking distance is not all or nothing – since many residents and employees outside that radius still walk to transit, though at diminishing rates as the distance from the station increases. In the case where the full development is not within a 2000-foot walk, placement of the more concentrated land uses closest to the transit facility is recommended. Projects located greater than 2,000 foot walking distance *may* qualify for the trip reductions described below. To qualify, the TIA must include a justification for the trip reduction based on evidence from studies of similar projects. The evidence provided should demonstrate that the proposed trip reduction is

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<sup>22</sup> Based on VTA's review of 1997 Caltrain and LRT shuttle ridership to and from Santa Clara County employment sites.

likely to be achieved given the land use context, distance from transit, type of transit service available, and pedestrian and bicycle conditions between the project site and the station. The Lead Agency may consider using the Peer/Study-based Approach to trip reductions (see *Section 8.2.3*), if appropriate.

To bolster the case for a trip reduction at a distance of greater than 2,000 feet from transit, VTA recommends that the project increase the quality of the walk experience between the development and the transit facility. Examples of these types of improvements include constructing sidewalks greater than the minimum sidewalk width, providing pedestrian scale lighting and landscaping, and adding signs to direct pedestrians and bicyclists to transit. In addition, the project must show that safe, pedestrian-friendly sidewalks or paths extend all the way from the project site to the transit stop.

Professional judgment should be used when taking transit proximity-related trip reductions from trip generation developed using alternative methodologies. Where a travel demand model or mixed-use trip generation model is used to estimate trips on all modes (i.e., including a mode choice component), care should be taken to not double-count the effect of proximity to transit.

The trip reduction values allowed for each type of project are as follows:

1. **Housing Near Light Rail, Bus Rapid Transit or Caltrain Station:** Housing developments where the walking distance from the unit or the front door of the housing complex to the station is 2,000 feet or less may reduce their trip generation volumes by nine percent (9%).<sup>23</sup> *In the case that a development is located near a rail/BRT station and a major bus stop, a reduction can only be taken for either the major bus stop or the rail/BRT station, and not a combination of the two transit facilities.*
2. **Housing Near a Major Bus Stop:** Housing developments where the walking distance from the unit or the front door of the housing complex to the major bus stop is 2,000 feet or less may reduce their trip generation volumes by two percent (2%).<sup>24</sup> *This reduction may not be combined with the trip reduction for housing located near light rail, BRT or Caltrain.*
3. **Employment Near Light Rail, Bus Rapid Transit or Caltrain Station:** Employment sites where the walking distance from the front door of the development to the station is 2,000 feet or less may reduce their trip generation volumes by six percent (6%).<sup>25</sup> *In the case that a development is located near a rail/BRT station and a major bus stop, a reduction can only be taken for either the major bus stop or the rail/BRT station, and not a combination of the two transit facilities.*
4. **Employment Near a Major Bus Stop:** Employment sites where the walking distance from the front door of the development to the major bus stop is 2,000 feet or less may reduce their

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<sup>23</sup> Santa Clara County Transportation Agency, "Transit-Based Housing Survey," September 1995.

<sup>24</sup> Same as previous footnote.

<sup>25</sup> Lund, Cervero, Wilson, *Travel Characteristics of Transit-Oriented Development in California*, Bay Area Rapid Transit District and California Department of Transportation, 2004.

trip generation volumes by two percent (2%). *This reduction may not be combined with the trip reduction for employment sites located near light rail, BRT or Caltrain.*

5. **Case-by-Case Approach for Proximity to BART Stations:** Residential and employment developments where the walking distance from the front door of the development to an existing or future BART station is 2,000 feet or less may apply a trip reduction in a TIA. When proposing such a reduction, Lead Agencies must obtain concurrence from VTA and provide a description of the methodology, source data and justification for the trip reduction in the TIA Report. The trip reduction for proximity to BART should take into account the attributes of the station area (land uses, transportation network, pedestrian and bicycle connections to the station) to ensure that the requested reductions are appropriate for the context. VTA may in the future provide suggested trip reduction rates (standard reductions) when data from the Santa Clara County BART stations becomes available.

#### **8.2.1.4      *Standard Trip Reduction Combinations***

Projects that combine two or more trip reduction strategies for which Standard Reductions are specified may take reductions off the trips generated by individual project components, as discussed below. The reductions shall be clearly explained, documented, and justified in the project's TIA Report and shall conform to the values listed in **Section 8.2** unless special circumstances are justified in the project's TIA.

Application of multiple trip reduction strategies will depend on the type and ratio of uses present in the project under study. For example, a mixed-use project composed mostly of housing with some retail that also participates in a shuttle program is allowed a 15% mixed-use reduction on the retail trip generation of the project. The housing trips should be reduced by no more than the same number of retail trips internal to the project. In addition, the housing component of the project will be allowed a 3% reduction for participation in a shuttle program. However, if the shuttle will serve the retail use as well as the housing component, and the retail use is large and generates a majority of the daily project trips, the 3% reduction for shuttle participation may be applied to both the retail and housing components of the project.

Similarly, a mixed-use housing and retail project located near transit will be allowed 15% reduction on trips generated by the retail portion of the project to account for the mixed-use nature of the project. Again, the housing trips should be reduced by no more than the same number of retail trips internal to the project. In addition, the housing portion will be allowed a 9% reduction for the location near transit.

If the TDM shuttle trip reduction is being combined with the 'Employment near LRT, BRT or Caltrain Station' reduction, the maximum shuttle trip reduction that can be taken is one and one-half percent (1.5%).

### 8.2.1.5 *Parking and Automobile Trip Reduction*

Recognizing that parking oversupply may itself have negative secondary effects, the TIA should discuss the project's approach to parking management. A parking management plan, shared parking, parking cash out, unbundled parking, carpool parking, and parking layout and design can be ways to encourage the use of alternative modes and reduce auto trips. If the project is using any of these measures as part of its overall TDM/trip reduction strategy, the Lead Agency shall document it in the TIA, and note it in the Auto Trip Reduction Statement. The parking analysis must explicitly discuss the relationship between the project's parking supply, parking demand and parking costs (if any) to vehicle trip reductions applied to the project.

### 8.2.2 **Target-Based Trip Reductions**

In addition to Standard Trip Reduction and Peer/Study-Based Trip Reduction approaches, projects may take a Target-Based Trip Reduction if documentation and justification are provided in the TIA Report, based on the guidance below. This approach may be taken when the project applicant has entered into an enforceable agreement with the Lead Agency that limits the number of automobile trips traveling to and from the project site. The trip reduction program must include a commitment to monitor trip generation and determine whether targets are met, an enforcement structure, and a commitment to summary-level data sharing.

It is recognized that Lead Agencies ultimately make decisions on project approvals, and therefore commitments to certain elements that would justify a Target-Based Trip Reduction will occur as an agreement between the project applicant and the Lead Agency, and it is responsibility of the Lead Agency to enforce those commitments. For the purpose of a TIA, stating a commitment and providing the documentation noted below is sufficient, provided that the commitment also appears in a legally enforceable document. Examples of such documents, for trip reduction documentation purposes, include Conditions of Approval, Development Agreements, CEQA Mitigation Monitoring & Reporting Programs (MMRPs), and/or Covenants, Conditions, & Restrictions (CC&Rs).

The following elements are **required** in a TIA Report for a project taking a Target-Based Trip Reduction:

- State a commitment to a specific reduction target (percentage trip reduction, non-auto mode split or trip cap). This statement should specify the starting point for the reduction (e.g., ITE auto trip generation rates based on square footage or number of units, total person-trips based on employee/resident count) and the time period for the reduction (peak hour, peak period and/or full day). For targets based on mode split, the statement should include a clear explanation of how to convert these figures back to auto trip generation rates to allow later monitoring and comparison;
- Provide a description of the types of TDM/trip reduction measures that are proposed in the program. It is recognized that the list will be preliminary and may change over time;

- State a commitment to periodic monitoring of project trip reduction. The methodology should follow industry standards to determine auto trip generation rates or mode splits and should be conducted by the Lead Agency or a third party. The TIA Report should describe the proposed monitoring approach;
- State a commitment to an enforcement/penalty structure. Lead Agencies retain flexibility to determine the parameters, and the enforcement/penalty structure may take the form of a ‘reinvestment clause’ where the project applicant/owner is required to invest more in trip reduction efforts if not meeting the target;
- State a commitment to provide summary level monitoring data (e.g., auto trip generation rates, mode shares) to VTA, through the Lead Agency. Data shall be provided on a biennial basis as part of the CMP Monitoring and Conformance Program.

The following elements are **encouraged** in a TIA Report for a project taking a Target-Based Trip Reduction:

- Detailed description of the TDM/trip reduction measures that are proposed in the program;
- Sharing of trip monitoring reports or more in-depth trip generation or survey data for the purpose of improving the *TIA Guidelines* in the future.

### **8.2.3 Peer/Study-Based Trip Reductions**

In addition to Standard Trip Reduction and Target-Based Trip Reduction approaches, projects may take a Peer/Study-Based Trip Reduction if documentation and justification are provided in the TIA Report, based on the guidance below. This approach may be used to justify a trip reduction based on a project’s similarity to other projects with demonstrated trip reductions or a project occupant’s track record of reducing trips at other sites, or to provide additional justification for trip rates based on local data collection efforts.

The following describes the requirements for documenting and justifying a Peer/Study-Based Trip Reduction percentage:

- Provide Data/Documentation in TIA Report: Lead Agencies may rely on existing studies or conduct their own study, as appropriate to develop the Peer/Study-Based trip reductions, and this data and documentation must be included in the TIA Report or its appendices. The documentation must include the data used to justify the Peer/Study-Based trip reduction rate, the source(s) referenced, and a detailed discussion of the assumptions and methodologies used. The methodology used to develop the Peer/Study-Based trip reduction rate should follow industry standards and in cases where the trip reduction rate is based on a limited sample size, professional judgment should be used to determine the suitability of the sample data;
- Ensure Appropriateness: Care must be taken to use data that is applicable to Santa Clara County conditions. As part of the documentation, Lead Agencies must specify the sample size, urban context, quality and type of transit services available, and any other relevant findings pertaining to the particular project attribute(s) in question;

- Provide a description of the types of TDM/trip reduction measures that are proposed in the program, if applicable;
- State a commitment to periodic monitoring of project trip reduction: The methodology should follow industry standards to determine auto trip generation rates or mode splits and should be conducted by the Lead Agency or a third party. The TIA Report should describe the proposed monitoring approach;
- State a commitment to provide summary level monitoring data (e.g., auto trip generation rates, mode shares) to VTA, through the Lead Agency. Data shall be provided on a biennial basis as part of the CMP Monitoring and Conformance Program.

See **Table 2**, below, for a comparison of Standard, Peer/Study-Based and Target-Based trip reduction approaches.

**Table 2: Comparison of Trip Reduction Approaches**

	<b>Standard Reductions</b>	<b>Peer/Study-Based Reductions</b>	<b>Target-Based Reductions</b>
Maximum percentages in VTA TIA Guidelines?	Yes, see <b>Table 1: Standard Auto Trip Reduction Rates</b>	No	No
Data required in TIA Report?	No	Yes, existing or new studies	No
Commitment to a target required?	No	No	Yes
Description of measures required?	No	Yes, if applicable	Yes
Monitoring required?	No	Yes	Yes
Enforcement required?	No	No	Yes
Data Sharing required?	No	Yes	Yes

### **8.3 Trip Distribution and Assignment**

The trip distribution step of a TIA consists of forecasting the travel direction of project-generated trips to and from the project site.

The trip distribution percentages shall be included in the TIA Report on a figure showing an area map with transportation facilities (roadways, transit lines, etc.) and the project site. The trip distribution figure should, at a minimum, show trip percentages at gateways, on nearby freeway segments, and along major arterials that provide direct access to the project site.

The trip assignment step of a TIA consists of assigning trips to specific transportation facilities on the basis of the trip distribution percentages. Assignment of trips should be based on existing traffic volumes, existing travel patterns or expected future travel patterns. The assignment of trips shall account for pass-by and diverted linked trips on transportation facilities near the project site (see *Section 8.3.1*). The trip assignments shall be included in the TIA Report on a figure showing project trips at study intersections.

The following are points that expand or provide detail regarding trip distribution and assignment:

1. **Review by Other Jurisdictions:** The Lead Agency shall be responsible for developing the trip distribution and assignment for a project. The trip distribution and assignment shall be reviewable by other jurisdictions (other cities, towns, the County, Caltrans, and/or VTA). Review by other jurisdictions should occur at the TIA Notification Form stage of the TIA preparation process. It is the responsibility of other jurisdictions to request trip distribution and assignment information from the Lead Agency once they are notified about a project.
2. **Use of VTA or Local Agency Models:** Model data may be used to develop trip distribution assumptions for a project. The use of this data is most appropriate for long-term projects or for near-term development projects where the roadway network in the vicinity of the project will change substantially. VTA can also provide trip tables by trip purpose and travel networks to Member Agencies that may be used to develop trip distribution assumptions for a project.
3. **Documentation of Assumptions:** The project's trip distribution and assignment assumptions shall be clearly documented in the TIA Report.

### **8.3.1 Pass-by Trips and Diverted Linked Trips**

Some projects will attract a large number of trips already on the system. For example, many people who would stop at a new neighborhood convenience store would do so on their way home from work; these people would not be making new vehicle-trips on the roadway. These pass-by trips are generally captured by small neighborhood services such as dry cleaners, convenience stores, gas stations and coffee shops and to a lesser extent such uses as grocery stores, pharmacies, shopping centers and restaurants. Such trips are classified into two categories: pass-by and diverted linked trips. According to the ITE *Trip Generation Handbook*, pass-by trips are attracted from traffic passing a site on an adjacent street that contains direct access to the generator. Pass-by trips do not require a diversion from another roadway. Diverted linked trips are attracted from roadways in the vicinity of a site and require a diversion from one roadway to another to gain access to the site.<sup>26</sup>

### **8.3.2 Allowable Reductions for Pass-by Trips and Diverted Linked Trips**

A reduction in project vehicle trip generation can be made for pass-by and diverted linked trips, provided that the reduction is applied according to the methodology outlined in the following

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<sup>26</sup> Institute of Transportation Engineers, *Trip Generation Handbook*, 2nd Edition, 2004, Chapter 5, pp. 29-82.

section. *This reduction must be clearly explained, justified, and documented in the TIA Report.* The trip reduction for pass-by and diverted linked trips shall be determined from established sources, such as ITE's *Trip Generation Handbook*, SANDAG, or surveys of similar land uses. Note that reductions for pass-by trips often differ from those for diverted linked trips. The pass-by and diverted linked trip reduction may only be taken for commercial land uses and should not be more than a **thirty percent (30%) combined pass-by and diverted linked trip reduction**. In addition, pass-by and diverted linked trips may not be excluded from the calculation of the 100 net new peak hour trip threshold that triggers the requirement for conducting a TIA except as noted in *Section 2.1*.

There are a few exceptions where pass-by and diverted linked trips may account for more than 30% of the trips made, such as at gas stations, fast food establishments, community centers, local public libraries, and isolated mini-markets. A higher trip reduction rate may be applied to these uses with approval of the Lead Agency and VTA. As with other pass-by trip reductions, the reduction rate must be clearly explained, justified, and documented in the TIA.

### **8.3.3 Application of Pass-by Trip and Diverted Linked Trip Reductions**

Subtracting pass-by and diverted linked trips from a site's trip generation volumes lowers the number of new trips added to the surrounding transportation system. However, additional turning movements or changes to the turning movements due to pass-by and diverted linked trips should be taken into account in transportation analyses to determine their impact on adjacent roadways. Answers to questions such as whether left turn pockets are long enough, whether U-turns are allowed, and whether additional turning movements will slow or conflict with other traffic are dependent on all project trips including the pass-by and diverted linked trips. *Appendix E* includes a methodology for applying pass-by and diverted linked trip reductions.

## Chapter 9. Project Conditions and Impacts/Effects

The TIA Report shall evaluate the addition of the project, along with estimated project-generated trips, to the “without project” analysis scenario (Existing, Background, or Cumulative Conditions without the project, as appropriate). This shall include the identification of any project impacts on CMP roadway facilities, and any negative effects on bicycle, pedestrian or transit conditions or vehicle queuing.<sup>27</sup> Mitigation measures and their associated costs shall be identified for impacts that exceed the impact thresholds described below. In some cases, such as a development project that closes a sidewalk gap or adds a bicycle lane to its frontage, effects on the transportation system may be beneficial as well as adverse. Lead Agencies are encouraged to describe the beneficial effects of a project; this information may also be included in a CEQA document.

### 9.1 Traffic

The TIA Report shall contain an evaluation of project impacts to traffic operations. Evaluation of impacts to traffic operations shall include, but not be limited to Auto Level of Service analysis and queuing analysis.

#### 9.1.1 Auto Level of Service Analysis

The CMP Auto Level of Service (LOS) standard is LOS E. *If the analysis shows that a development project is projected to cause Auto LOS on a CMP facility (roadway or intersection) to fall from LOS E or better to LOS F under project conditions, then the project is said to impact the facility.*

In addition, for facilities determined to have been at LOS F under the without project analysis scenario (Existing, Background or Cumulative Conditions without the project), a project is said to impact the facility if the analysis shows that the project will cause Auto LOS to deteriorate by a given threshold amount. The threshold amounts for each of the three CMP facility types are described as follows:

1. **Intersections at LOS F:** A project is said to impact an intersection determined to have been at LOS F under the without project analysis scenario if:
  - *addition of the project traffic increases the average control delay for critical movements by four (4) seconds or more, and*
  - *project traffic increases the critical v/c value by 0.01 or more.*

The exception to this threshold is when the addition of project traffic reduces the amount of average control delay for critical movements, i.e., the change in average control delay for critical movements are negative. In this case, the threshold is when the project increases the critical v/c value by 0.01 or more.

2. **Freeway Segments at LOS F:** A project is said to impact a freeway segment determined to have been at LOS F under the without project analysis scenario if *the number of new trips*

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<sup>27</sup> The determination of which facilities to evaluate is described in *Section 2.2* of these Guidelines.

**added by the project is more than one percent of the freeway capacity.** This calculation shall be for each direction of travel. Analysis should be conducted for all freeway lane types to which project trips are assigned, including HOV and Express Lanes, if applicable. Tables for the freeway analysis determination and impact analysis should include detailed data such as density and speed. Sample tables are shown in **Appendix A (Table A-1: Sample of Freeway Analysis Requirement Determination and Table A-2: Sample of Freeway Analysis Summary)**.

3. **Rural Highway at LOS F:** A project is said to impact a rural highway determined to have been at LOS F under the without project analysis scenario, if **the number of new trips added by the project is more than one percent of the rural highway capacity.** This calculation shall consider both directions of travel.

### 9.1.2 Queuing Analysis

A queuing analysis shall be included in a TIA, at a minimum, in the following instances:

- At CMP intersections where Auto Level of Service (LOS) analysis indicates that there will be a significant impact according to the CMP LOS standard;
- At on-ramps with existing or planned operational ramp meters;
- At off-ramps controlled by signals at junctions with local streets;
- At any other intersection or freeway on-ramp, based on engineering judgment, proximity of the project to a freeway interchange, existing queuing situations (such as spillback onto local streets from on ramps), or localized conditions along the project's frontage.

Negative effects of queuing on CMP facilities shall be identified by comparing the calculated design queue to the available queue storage. Queuing effects to be identified include, but are not limited to the following:

- Spillback queues from turn lanes at intersections that block through traffic;
- Queues from one intersection or closely-spaced intersections that extend back and impact other intersections;
- Queues from bottleneck locations such as lane drops that impact the operation of the facility;
- Spillback queues on ramps that impact surface street or freeway operations;
- Queues at intersections in proximity to freeway ramps.

Evaluation of queuing effects is required for only the near-term analysis. However, Lead Agencies may require this analysis for longer term projects to plan for improvements in later years.

Refer to the VTA *Traffic Level of Service Analysis Guidelines* for further information on ramp queuing analysis. Lead agencies should contact Caltrans staff to obtain current ramp metering rates.

## 9.2 Transit

The TIA Report shall include an analysis of project effects on the transit system. The evaluation shall consider transit vehicle delay, transit access and facilities, as described below.

**Transit Vehicle Delay:** The TIA Report shall include an analysis of the effects of the project on transit vehicle delay. This analysis shall include the following components:

- A quantitative estimate of additional seconds of transit vehicle delay that will result from automobile congestion caused by the project and any changes to signal operations proposed by the project. This analysis may utilize information produced by the intersection Auto Level of Service (LOS) analysis or other sources, if available;
- A qualitative assessment of additional transit vehicle delay caused by any roadway or intersection geometry changes proposed by the project, taking into account unique considerations of transit vehicles compared to autos (e.g., pulling into and out of stops, longer gaps needed for left turns). These qualitative considerations may also inform the assessment of transit vehicle delay caused by auto congestion.

If increased transit vehicle delay is found in this analysis, the Lead Agency should work with VTA to identify feasible transit priority measures near the affected facility and include contributions to any applicable projects that improve transit speed and reliability in the TIA. Refer to **Section 10.2** for more information on improvements to address congestion effects on transit travel times.

More information on the practice and research basis for transit delay analysis can be found in **Appendix F**.

**Transit Access and Facilities:** The TIA Report shall include an assessment of transit access and facilities near the project site. The assessment shall include the following elements:

- Description of pedestrian access from the project to nearby transit stops. This should include both an assessment of access within the site (i.e., from buildings on the site to the public sidewalks) and off-site (i.e., presence/absence of continuous sidewalks and safe crossings to access transit);
- Disclosure of any permanent or temporary reduction of transit availability or interference with existing transit users (e.g., relocation/closure of a transit stop or vacation of a roadway utilized by transit);
- Disclosure of project location more than 1/2 mile from existing or planned transit services, with the potential for generating a demand for such services. Such projects are encouraged to identify funding sources to provide public or private transit services, if needed;
- Description of proposed actions to enhance transit service, access or facilities (e.g., bus stop improvements on a project frontage), or to mitigate negative effects on existing transit systems or facilities that result from the proposed project.

### **9.3 Bicycle and Pedestrian**

The TIA Report shall include an analysis of bicycle and pedestrian modes under project conditions. The analysis shall address project effects on existing bicyclists and pedestrians as well as the effects and benefits of site development and associated roadway improvements on bicycle/pedestrian infrastructure, circulation, Quality of Service (QOS), and conformance to existing plans and policies. (Bicycle/pedestrian site access and circulation are addressed in **Section 9.4**.)

### *Quality of Service Analysis*

Projects that propose changes to existing roadway or intersection geometry, or changes to signal operations, shall include a QOS analysis for bicyclists and pedestrians for those locations where changes are proposed.

Lead Agencies have the discretion to select appropriate methodologies for bicycle and pedestrian QOS analysis. Agencies must include a description and justification of the methodology being used, and identify key data inputs and assumptions for the methodology. Agencies are encouraged to use the methodology in the latest Highway Capacity Manual, or a similar methodology, for the QOS analysis. See **Chapter 5** and **Appendix G** for more information on pedestrian and bicycle QOS methodologies. VTA staff can act as an additional resource to Lead Agencies in selecting QOS methodologies.

Projects that do not propose changes to existing roadway or intersection geometry, or changes to signal operations, are not required to include a QOS analysis, but such analysis is encouraged for project frontages.

### *Descriptive Analysis*

In addition to the QOS analysis (if applicable), the TIA Report shall include a descriptive evaluation of project effects on and benefits to bicycle and pedestrian conditions. The descriptive analysis should encompass a radius of 2,500 feet from the project site for bicycle facilities, and a radius of 1,000 feet from the project site for pedestrian facilities. Within this radius, the descriptive analysis should focus on the project street frontages, paths to major attractors (such as transit facilities, schools, shops and services, and major residential developments), and bicycle and pedestrian deficiencies identified in the Existing Conditions analysis.

The following questions should be addressed:

1. Consistency with Existing Adopted Plans
  - How does the project implement, preclude, modify, or otherwise affect proposed bicycle and pedestrian projects and/or policies identified in the Lead Agency's adopted Bicycle Plan, Pedestrian Plan, Trails Master Plan, and/or bicycle/circulation element of their General Plan?
  - How does the project implement, preclude, modify, or otherwise affect proposed bicycle and pedestrian projects and/or policies identified in other agencies' plans (e.g., Countywide Bicycle Plan, adjacent cities' Bicycle Plans or Pedestrian Plans, Bay Trail Plan)?
  - What provisions for bicycle parking and storage are provided by the project? Calculate the required bicycle parking in accordance with the City's ordinance or, if none, VTA *Bicycle Technical Guidelines (BTG)*, and indicate proposed type of Class 1 and Class 2 parking to be provided by the project. Proposed bicycle parking locations should be noted on the site plan. Refer to **Appendix H** for a table of Bicycle Parking Supply Recommendations from the VTA *BTG*.

## 2. Effects on Existing Bicyclist/Pedestrian Circulation in the Project Area

- Would the project benefit or enhance existing bicycle and pedestrian access and circulation? For example, would it provide bicycle-friendly and pedestrian-friendly improvements like those identified in VTA *BTG*, *Pedestrian Technical Guidelines*, or *CDT Manual*? If so, describe;
- Would the project reduce, sever or eliminate existing bicycle or pedestrian access and circulation? If so, describe;
- How does the project address bicycle and pedestrian deficiencies identified in the Existing Conditions analysis?
- If a new traffic signal is being installed as part of the project or project mitigation, the TIA should note that adequate bicycle and pedestrian detection and signal timing should be provided. (See VTA *BTG*, Chapter 6.)

### 9.4 Site Circulation and Access

The TIA Report shall include an analysis of site circulation and access. The evaluation of site circulation and access shall consider the following issues:

- The assessment of site circulation and access must explicitly discuss the relationship between site design and any vehicle trip reductions that are applied to the project. The assessment should include the pass-by and diverted trips that would access the site;
- The assessment of access shall include an analysis of trips entering and exiting the site at each driveway. Distribution of trips to access points should consider street configuration, storage lanes, acceleration and deceleration lanes, and sight distance;
- A Site Plan shall be provided with adequate detail to show auto, bicycle and pedestrian circulation within the site and connections to the outside transportation network;
- The site circulation and access assessment shall include an analysis of the proposed bicycle access and onsite circulation with recommendations to encourage bicycle trips to and within the site. Address adverse circulation issues, if any, which were identified in the Existing Conditions analysis;
- The assessment of site access shall include an analysis of the proposed pedestrian access and onsite circulation with recommendations to encourage pedestrian trips to and within the site. Include an assessment of pedestrian access between the site and the nearest bus stops. Address adverse site circulation issues, if any, which were identified in the Existing Conditions analysis. Also address the extent to which the ability of bicyclists and pedestrians to access the project site is inhibited by manmade and natural barriers such as railroad crossings, rivers, freeways, dead-end streets, and cul-de-sacs;
- The site circulation and access assessment may also include analysis of emergency vehicles and service vehicles, including delivery and garbage trucks.

## Chapter 10. Mitigation Measures and Multimodal Improvements

This chapter describes the analysis required to evaluate 1) mitigation measures to address project impacts per CMP standards, and 2) improvements to address other project-related effects on the transportation system, including changes that affect transit, pedestrian and bicycle modes and queuing at ramps and intersections. Throughout this section, “impact” is used to refer to project effects on the CMP system as determined by the standards and impact thresholds established by VTA, and “mitigation” is used to refer to changes that address those impacts. The term “effect” refers to project-related effects on elements of the transportation system for which no CMP standard or impact threshold has been established, and “improvement” is used to refer to changes that address those effects. The TIA should particularly focus on project-related effects that tend to degrade pedestrian, bicycle and transit conditions.

### 10.1 Mitigations to Address CMP Standards

The TIA Report shall include a discussion of mitigation measures to address any impacts per CMP standards identified in the analysis. The TIA shall identify those mitigations for which the sponsor of the proposed project is responsible. The following issues regarding mitigation measures shall be addressed:

1. The goal of the Lead Agency shall be to maintain the CMP Auto Level of Service (LOS) standard on CMP facilities, and to mitigate any other impacts identified in the TIA Report. However, if this is not possible, mitigation measures that minimize impacts by limiting the degree or magnitude of the action and its implementation, and/or compensate for the impact by replacing or providing substitute resources shall also be considered. The mitigation measure could be fully-funded and implemented by the project sponsor or the project sponsor could make a contribution to the cost of implementing the measure, in coordination with other agencies. Information on voluntary contributions to regional transportation improvements can be found in *Appendix I, Board Memorandum: Update on Voluntary Contributions to Transportation Improvements*.
2. The Lead Agency shall consider all of the following categories of mitigation measures for impacts identified through the analysis:
  - Physical or capacity-enhancing improvements to the affected transportation facility (e.g., adding a turn lane to an intersection to address an Auto LOS impact);
  - Operational and/or efficiency improvements to the affected transportation facility (e.g., changing signal operations at an intersection or contributing to the implementation of Express Lanes on a freeway segment to address an Auto LOS impact);
  - Projects and programs used to reduce project auto trip generation, including TDM programs as well as capital improvements to transit, bicycle and pedestrian facilities, if not already included in the proposed project description. Examples could include constructing wider sidewalks, adding a bicycle lane or non-motorized trail, or a shuttle service from the proposed development to a nearby transit facility (e.g., BRT stop or light rail station).

3. The Lead Agency shall identify the feasibility of the proposed mitigation measures. Feasibility of physical improvements shall be verified in the field. Feasibility of all measures shall be confirmed with the appropriate agency or agencies (e.g., the agency responsible for maintaining a roadway or for implementing an operational improvement). Proposed mitigation measures for impacts to CMP facilities must be reviewed with VTA staff prior to the issuance of the TIA Report.
4. The description of all mitigation measures shall include identification of who is responsible for implementing each mitigation measure, when the mitigation measure will be implemented as it relates to the occupancy of the proposed project, and the cost of implementation, as appropriate. The cost estimate for mitigation shall be based on the feasibility analysis and/or a Capital Improvement Program estimate, if available. Lead Agencies are encouraged to have a registered civil engineer develop the cost estimate for any physical mitigations.
5. ***If a project causes a transportation impact that cannot be mitigated to the CMP Auto LOS standard, a Multimodal Improvement Plan must be provided along with the TIA, or the project applicant must agree in advance to participate in the implementation of the Multimodal Improvement Plan after project approval.*** Multimodal Improvement Plans are plans to identify offsetting measures to improve transportation conditions on CMP facilities in lieu of making physical traffic capacity improvements such as widening an intersection or roadway. Further information regarding steps for developing Multimodal Improvement Plans, and how Multimodal Improvement Plans relate to the land use approval process, is provided in the VTA *Deficiency Plan Requirements*.

Multimodal Improvement Plans can range in size from Areawide (such as an entire city) to Specific Area (such as a roadway segment within a downtown area) to Mini (covering a single intersection). If the need arises for the preparation of a Multimodal Improvement Plan, VTA will work with the Lead Agency to tailor the level of the Multimodal Improvement Plan to match the scope of the deficiency. VTA will work with the Lead Agency as necessary to identify action items (or offsetting measures) as described in the VTA *Deficiency Plan Requirements*. Action items from the *Deficiency Plan Requirements* are provided in **Appendix J**.

6. If a project impacts a CMP System facility that has a Multimodal Improvement Plan, it is subject to the conditions of the Plan. The project's TIA Report shall identify what role the project will play in implementing the Multimodal Improvement Plan actions.
7. Mitigation measures for Auto Level of Service (LOS) shall not unreasonably degrade bicycle, pedestrian or transit access, and circulation. If a project proposes mitigation for Auto LOS involving a change to existing roadway or intersection geometry, or changes to signal operations, the TIA shall analyze and disclose secondary effects on other modes, i.e., whether the mitigation would affect pedestrian or bicycle conditions or increase transit vehicle delay.

For the bicycle and pedestrian secondary effects analysis, a QOS-based methodology (as cited in *Sections 5.2.5* and *5.2.6*) is encouraged, although a text description of changes may be substituted. At a minimum, the TIA shall disclose any of the following effects that would result from a recommended mitigation measure:

- Reducing, severing or eliminating existing bicycle or pedestrian access and circulation;
- Narrowing of sidewalk or removal of sidewalk (even if only on one side of street);
- Removal of crosswalk;
- Increased crossing distances;
- Longer signal cycles;
- Removal of a buffer between pedestrians and automobiles;
- Decreasing bike lane width or eliminating bike lane including at intersection approach due to addition of right-turn only lane;
- Reducing shoulder width to less than five feet on roadways without bike lanes (see VTA *BTG*, Section 7.4.2);
- Decreasing outside lane width on roadway without bike lanes or shoulders (see VTA *BTG*, Section 7.2);
- Installation of double right-turn lane, a free right-turn lane, or free-flowing freeway on and off ramps (see VTA *BTG*, Section 5.1);
- Revised signal timing and inadequate detection (see VTA *BTG*, Chapter 6, for recommendations on bicycle signal timing and detection at intersections);
- Changes to existing bike paths such as alignment, width of the trail ROW or trail tread, length of the trail, horizontal and vertical clearance;
- Precluding, modifying, or otherwise affecting proposed bicycle and pedestrian projects and/or policies identified in the Lead Agency's adopted Bicycle Plan, Pedestrian Plan, Trails Master Plan, and/or bicycle/circulation element of their General Plan; or other agencies' plans, e.g., Countywide Bicycle Plan, adjacent Cities' Bicycle Plan or Pedestrian Plan, Bay Trail Plan;
- Other roadway modifications that adversely impact bicycle or pedestrian conditions.

The analysis of secondary effects on transit vehicle delay resulting from proposed mitigation measures shall include the following components:

- A quantitative estimate of additional seconds of transit vehicle delay that will result from any signal operations changes proposed by the mitigation. This analysis may utilize information produced by the intersection Auto LOS analysis or other sources, if available;
- A qualitative assessment of additional transit vehicle delay caused by any change to existing roadway or intersection geometry proposed by the mitigation, taking into consideration unique considerations of transit vehicles compared to autos (e.g., pulling into and out of stops, longer gaps needed for left turns).

## 10.2 Improvements to Address Other Project-Related Effects

Per the requirements set forth in *Chapter 9, Project Conditions and Impacts/Effects*, the *TIA Guidelines* require Lead Agencies to analyze project effects on certain parts of the transportation system for which no CMP standard or impact threshold has been established. For the bicycle and pedestrian analysis of Project Conditions, a QOS-based methodology is required in certain situations and a descriptive analysis is required in all cases (as described in *Section 9.3*). For the transit analysis of Project Conditions, an analysis of transit vehicle delay, transit access and facilities is required (as described in *Section 9.2*).

As no CMP standards or impact thresholds have been established for these modes, Lead Agencies may opt to use this analysis in the TIA for informational purposes only. However, if the bicycle, pedestrian and/or transit analysis shows that the project would degrade conditions for one or more of these modes, the Lead Agency is encouraged to identify improvements that would reduce the effects. Improvements may include, but are not limited to:

- Providing or improving sidewalks, providing pedestrian crossing facilities or pedestrian wayfinding systems, or modifying intersections to shorten crossing distances (e.g., by installing curb extensions);
- Providing additional bicycle lane markings at intersections, bicycle signage, and/or increasing bicycle lane widths;
- Modifying signal timing and/or signal equipment for bicyclists and pedestrians;
- Adding a queue jump lane or bulb-out transit stop to address a congestion effect on transit travel speed;
- Contributing to the implementation of Transit Signal Priority<sup>28</sup> to address a congestion effect on transit travel speed.

Some improvements to address congestion effects on transit travel speed may be feasible to implement on a case-by-case basis, such as queue jump lanes and bulb-out transit stops, while some measures would require closer coordination with VTA to determine whether an applicable project exists, such as transit priority signal timing and dedicated transit lanes. In all cases, the Lead Agency should consult with VTA to determine the feasibility of any improvement.

If the TIA includes queuing analysis (see *Section 9.1.2*) and finds that freeway ramp spillback will occur, potential improvements include additional lanes (either HOV or mixed-flow) on ramps, or restriping. If the Lead Agency proposes a change to freeway ramps, including ramp metering flow rates, it should consult Caltrans. If the queuing analysis finds that spillback will occur at intersections, potential improvements include lengthening turn pockets, restriping, or changes to signal operations.

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<sup>28</sup> VTA will coordinate with the Lead Agency before implementing Transit Signal Priority.

## **Chapter 11. Future Year Scenarios (Cumulative Conditions)**

This chapter provides guidance for future year (Cumulative Conditions) scenario analysis for CMP purposes. In general, the Cumulative Conditions scenario is analyzed as the combination of Background Conditions (Existing Conditions + Approved Projects) + Expected Growth + Project.

Lead Agencies should note that future year/Cumulative Conditions scenarios may be defined differently for CEQA documents than for TIAs. The analysis method that shall be used for preparing a Cumulative Conditions Scenario in a TIA depends on the type of project under development or planning effort underway, as well as the time horizon. Analysis methods for preparing a TIA for near-term development projects, long-term development projects and long-term general planning efforts are presented in this chapter. Definitions for terms used in this chapter are provided in *Appendix L*.

### **11.1 Near-Term Development Project (occupancy within five years of approval)**

Near-term development projects include most development projects encountered by local agencies as part of their day-to-day operations. The development proposal for a near-term project, when approved, will generally result in the granting of an entitlement for the construction of a specific type and size development. A near-term project will usually be built and occupied within five years of project approval.

The *TIA Guidelines* must be followed to analyze transportation impacts associated with near-term specific development projects. For near-term development projects, Lead Agencies may use two cumulative analysis scenarios for planning and information purposes: Opening Year/Short-Term and Long-Term.

#### **11.1.1 Opening Year/Short-Term Analysis**

The opening year/short-term Cumulative Conditions analysis of a near-term development project shall consist of an analysis of growth expected until the project is available for final occupancy. The Lead Agency shall be responsible for determining the approach for calculating Expected Growth. Expected Growth can be estimated in three ways:

- a. Apply an annual growth rate to Background Conditions;
- b. Estimate trips generated by other proposed development projects in the area; or
- c. Apply an annual growth rate and estimate trips generated by other proposed development projects in the area.

Data from the CMP Monitoring and Conformance Program can be used to estimate an annual traffic growth rate for near-term developments. If other proposed development projects are expected to generate more trips in the area than the estimated trips using a growth rate, then the Expected Growth should be based on method (b) or (c) above.

### 11.1.2 Long-Term Analysis

The Lead Agency may choose to conduct a long-term Cumulative Conditions analysis (e.g., over a 20 or 25-year time horizon) for CEQA or local purposes. The Lead Agency shall be responsible for determining the approach for calculating Expected Growth. In this case, Expected Growth is typically analyzed in one of two ways:

- a. Apply an annual growth rate to Background Conditions; or
- b. Use information from a travel demand forecasting model for the Expected Growth in the horizon year.

### 11.2 Long-Term Development Project (occupancy beyond five years from approval)

Long-term development projects include those that have a specific development proposal that is expected to be built and occupied in more than five years from the date of approval. Due to this project completion time, most long-term development projects are phased-development projects. The following describes the analysis approach for a long-term project with full entitlement and a long-term project with phased entitlement:

- **Entire Project Granted Full Entitlement:** If the entire long-term project is to receive development entitlement, the *TIA Guidelines* must be followed to analyze transportation impacts associated with the entire long-term project. This analysis shall set the likely magnitude of mitigations required of the developer.
- **Phased Project with Phased Entitlement:** The approach to assessing the effects of a long-term project where development entitlement will be phased consists of initially completing a long-term analysis for the entire project at buildout. This analysis shall set the likely magnitude of mitigations required of the developer. This may require the use of a transportation demand model to assist in estimating traffic volumes or travel patterns and conduct the analysis for the buildout scenario. The approach also consists of following the *TIA Guidelines* to analyze transportation impacts for each phase of the project.

With the analysis of each subsequent project phase after the first phase, the long-term analysis for the entire project at buildout shall be re-evaluated. If conditions have not changed, the initial mitigation measures for buildout conditions would remain valid. If conditions have changed, a revised set of mitigation measures for buildout conditions would be developed. The advantage of this approach is that it is unlikely that there will be significant unanticipated transportation impacts of the project that the Member Agency itself will need to mitigate.

Use of the countywide transportation model developed and maintained by VTA or a local transportation sub-model may be appropriate for the analyses of long-term development projects. Refer to **Section 5.3, Use of Transportation Models**, for more information on modeling procedures and consistency.

### 11.3 Long-Term General Planning Efforts

Long-term general planning efforts typically include General Plan Amendments, General Plan updates, Precise Plans and Specific Plans, which grant no entitlements for any specific development project. In many cases, preparation of these planning efforts will require environmental review, which will consider transportation. As long as a transportation analysis is being completed, VTA recommends that the analysis be consistent with the *TIA Guidelines* to the extent possible.

Use of the countywide transportation model developed and maintained by VTA may be appropriate for the analyses of long-term general planning efforts. Refer to **Section 5.3** for more information on modeling procedures and consistency.

In many cases, the transportation analysis for a long-term general planning effort may produce freeway and arterial volumes, but there may not be enough data to perform detailed intersection-level analyses. The analysis of intersection turning movements as part of a long-term general planning effort analysis should recognize the difficulty in predicting specific travel patterns within a long-term planning horizon. The Lead Agency may wish to supplement the analysis with other, broader measures, such as percent of congested lane-miles, Vehicle Miles Traveled, changes in mode share, and/or measures of network connectivity and distance to destinations for pedestrians and bicyclists.

## PART IV – OTHER CONSIDERATIONS

### Chapter 12. Special Project Types

#### 12.1 Large or Unique Projects

Lead Agencies that are evaluating large or unique development projects such as arenas, stadiums, large scale mixed-use developments, and large Transit-Oriented Developments (TODs), should facilitate early coordination with the agencies whose jurisdictions will be affected by the projected increased vehicle and person trips by using the TIA Notification Form. Examples of transportation related areas that may require early coordination are trip assignment and trip distribution, assessment of approved projects for the Background Conditions, and assumptions that may be used to identify mitigation measures and improvements.

#### 12.2 Projects on a Jurisdiction Border

Similar to the early coordination process recommended for large or unique projects, a Lead Agency evaluating a development project that is located near or on the city or county border and projected to generate 100 or more net new peak hour trips, should coordinate with the adjacent jurisdiction(s) to discuss transportation related issues such as assessment of existing conditions, trip assignment, trip distribution, and mitigation measures and improvements as appropriate.

#### 12.3 Multi-Agency Projects

For projects that extend in multiple jurisdictions such as shopping centers or large developments, the Lead Agency should facilitate early coordination with the participating agencies. Examples of transportation-related areas that may require early coordination are assessment of approved projects for Background Conditions, assumptions for the travel demand model, and feasibility of and responsibility for mitigation measures and improvements.

#### 12.4 Projects Generating Large Numbers of Pedestrian, Bicycle or Transit Trips

For projects that generate unusually large volumes of pedestrian, bicycle or transit trips, it may be necessary to include a quantitative analysis of demand and capacity for these modes. Examples of typical land uses that may require a pedestrian, bicycle or transit capacity analysis are arenas and stadiums, special event sites, large mixed-use developments and TODs, and schools.

The transit capacity analysis should consider the existing ridership and load factors of transit routes near the proposed project, which can be obtained by consulting with VTA and other transit operators that may be affected (e.g. Caltrain, ACE, etc.). If the new transit ridership generated by the project causes the load factor of one or more transit routes to exceed the standard established by the applicable transit agency, the project should contribute to transit improvements to enhance the capacity of the affected route or provide alternative facilities.

Projects that generate unusually large pedestrian or bicycle volumes should consider the effects of those volumes on pedestrian or bicycle facilities. VTA recommends using a methodology that accounts for pedestrian and bicycle capacity, spacing, and conflicts, such as the Highway Capacity Manual 2010 methodology (Chapters 16 and 23), or similar methodologies. If the additional bicycle or pedestrian volumes generated by the project would unreasonably degrade conditions on bicycle and pedestrian facilities, the project should contribute to improvements to the conditions of the affected facility or provide alternative facilities.

## **12.5 Transit Delay Analysis for Large Projects, General Plans and Areawide Plans**

Large development projects, General Plan Amendments and updates, and area-wide plans should include a more extensive quantitative analysis of transit delay than the analysis discussed in **Section 9.2**. VTA recommends using travel demand model data, when available, to estimate transit delay on transit corridors within the project study area. If a travel demand model is not prepared for the project, VTA recommends that transit delay be analyzed based on the methodology discussed in **Section 9.2**.

If increased transit vehicle delay is found in this analysis, the Lead Agency should work with VTA to identify feasible transit priority measures near the affected facility and include contributions to any applicable projects that improve transit speed and reliability in the TIA. Refer to **Section 10.2** for more information on improvements to address congestion effects on transit travel times.

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