TRANSPORTATION IMPACT ANALYSIS GUIDELINES

APPENDIX H
BICYCLING

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Appendix H
Bicycling Memorandum

Date: February 14, 2019
To: Record No. 2015-012094GEN
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Reviewed by Manoj Madhavan and Wade Wietgrefe
RE: **Transportation Impact Analysis Guidelines Update, Bicycling**

INTRODUCTION

This memorandum updates the prior guidance provided in the Transportation Impact Analysis Guidelines for the bicycling[1] topic. The department prepared this memorandum in consultation with stakeholders (e.g., city and county agencies, consultants). The department will issue memoranda that provide updates to other topics (e.g., transit, loading) within the guidelines. When the department issues a memorandum about a topic, it will supersede existing guidance regarding that topic.

This memorandum provides specific guidance on the methodology and impact analysis required for the bicycling transportation topic. Overall guidance on conducting transportation analysis for environmental review, including developing the project description, how to address the significance criteria, methodology, and impact analysis, is in the Transportation Impact Analysis Guidelines.

The guidance provided herein assumes a land use development project located outside of an area plan that requires a transportation impact study. Guidance on other types of projects, such as projects located in an area plan or infrastructure projects, is discussed below under the "Other" subsection. The department may use this guidance for multiple projects, but the department has discretion on how to apply the guidance on a project-by-project basis.

The organization of the memorandum is as follows:

1) Project Description
2) Significance Criteria
3) Existing and Existing plus Project
   a) Methodology
   b) Existing Baseline
   c) Impact Analysis
4) Cumulative
   a) Methodology
   b) Impact Analysis
5) Other (covers different types of projects)

[1] This memorandum addresses impacts to people bicycling for the purpose of transport, recreation, or exercise.

Attachments to this memorandum are under separate cover and are attached to the end of this memorandum. The department may update the attachments to the memoranda more frequently than the body of the memoranda.

PROJECT DESCRIPTION

Refer to the Transportation Impact Analysis Guidelines Appendix A, Tables 1-3, for a list of the typical physical, additional physical, and programmatic features for existing and existing plus project conditions, as applicable. The geographic extent of these features must, at a minimum, include the project's frontage and may include the entirety of the project's block. Appendix A, Table 4 of the guidelines provides a non-exhaustive list of approvals from agencies other than the planning department that a project sponsor may need to obtain for the project description features described in the guidelines. Attachment A of this memorandum includes examples of figures that illustrate how to graphically represent bicycling conditions.

SIGNIFICANCE CRITERIA

San Francisco Administrative Code section 31 directs the department to identify environmental effects of a project using as its base the environmental checklist form set forth in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. As it relates to people bicycling, Appendix G states: "would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?" The department generally uses the following significance criteria to evaluate that question: A project would have a significant impact if it:

1) Creates potentially hazardous conditions[2] for people bicycling; or

2) Interferes with accessibility of people bicycling to and from the project site, and adjoining areas.

EXISTING AND EXISTING PLUS PROJECT

Methodology

This section describes the typical methodology required to address the significance criteria. The methodology section identifies the collection, generation, and approach to analyze data. The department will determine whether to adjust the methodology as necessary to inform the transportation analysis.

The guidelines provide direction on the geographical area and period required for analysis. Further guidance on the typical methodology for evaluating existing and existing plus project conditions for this topic, including data collection, is provided below. This section also indicates in bracketed text [ ] whether the presentation of typical methodological elements in other sections of a transportation study (e.g., baseline, impact analysis) could occur in text, a figure, and/or a table (see Appendix A of the guidelines for examples of typical tables and Attachment A of this memorandum for examples of bicycling-related figures).

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[2] For the purposes of this memorandum, "hazard" refers to a project generated vehicle potentially colliding with people walking that could cause serious or fatal physical injury, accounting for the aspects described below. Human error or non-compliance with laws, weather conditions, time-of-day, and other factors can affect whether a collision could occur. However, for purposes of CEQA, hazards refer to engineering aspects of a project (e.g., speed, turning movements, complex designs, substantial distance between street crossings, sight lines) that may cause a greater risk of collisions that result in serious or fatal physical injury than a typical project. This significance criterion focuses on hazards that could reasonably stem from the project itself, beyond collisions that may result from aforementioned non-engineering aspects or the transportation system as a whole.

Existing Conditions

The following identifies the typical methodology for assessing existing conditions.

Counts

The methodology may include prior counts collected from other studies or sources combined with (e.g., an average of three different dates with counts at the same intersection, global positioning system user data)[3] or in isolation from the counts collected for the project. The use of prior counts must be justified, in consultation with the department. Typically, the use of prior counts may occur if these counts have not changed substantially under existing conditions (e.g., due to lack of new development, circulation changes, or travel patterns). [text, table]

Visual Analysis with Recorded Observations

Data collection for the project should include a site visit for a visual analysis, with recorded observations of the absence, discontinuity, or presence of the features listed in the project description as well as a description of the weather conditions at the time of the site visit. In addition, the site visit must record any existing potential or observed hazards at locations in the study area where people are bicycling, especially if the project site is on or adjacent to bicycle facilities (e.g. routes identified as part of the San Francisco Bikeway Network or a bike share station), or major destinations (e.g., schools, event centers, recreational facilities, tourist activities, shopping districts). [text, figure]

Street Design Characteristics

Obtain the following general characteristics of streets within the study area:

- Location and type of traffic control devices (e.g., stop signs, signals, bicycle-only control traffic devices) [text, figure]
- Number of travel lanes by type (e.g., mixed flow, parking, bicycle, transit-only, etc.) [text, figure]
- Posted speed limit and recorded speed observations or inferences about observed speeds [text]
- Presence of High-Injury Corridor [text, figure]
- San Francisco Bikeway Network designation [text, figure]

Obtain the following additional characteristics of streets within the study area to the extent applicable:

- Signal timing and phasing of traffic control devices [text]
- Width of travel lanes [text, figure]
- Number of travel lanes by type at intersections (if different from midblock) [text, figure]
- Length of blocks [text, figure]
- Data regarding the location and causes of collisions (e.g., particular turning movements) [text, figure]

Existing plus Project Conditions

The following identifies the typical methodology for assessing existing plus project conditions.

[3] Due to steady growth in people bicycling throughout San Francisco, unless conditions change, the use of prior counts should typically not exceed three years.

Travel Demand Analysis

Estimate the number of people bicycling and driving from the project. [text, table] In addition, the methodology will distribute and assign the project's vehicle trips to roadways, intersections, loading zones, and driveways to the extent applicable. Describe bicycling trips to and from the project site, particularly between the project site and major destinations and routes identified in the San Francisco Bikeway Network. [text, figure]

Potentially Hazardous Conditions

Use the travel demand analysis and project elements to determine if the project would cause potentially hazardous conditions. The methodology should assess to the extent applicable:

- The number, movement type, sight lines, and speed of project vehicle trips in and out of project facilities based upon the design of such facilities (e.g., curb cut dimensions, roadway speeds) in relation to the number of people bicycling at those locations [text, figure]
- The location of the project in relation to bicycle facilities (e.g., bike share stations or San Francisco's Bikeway Network)
- The number and movement type of project-generated vehicle trips into or out of a loading zone across an area frequently used by people bicycling (i.e., supported by counts or observations) or a bicycle facility (e.g., part of San Francisco's Bikeway Network)
- The number, type (e.g., left turn, right turn), sight lines, and speed of project vehicle turning movements at intersections, including any changes to the public right-of-way that facilitate vehicular movement (e.g., channelized turns), in relation to the number of people bicycling at those movement locations [text, figure]

Accessibility

Use the travel demand analysis and project elements to determine if the project would interfere with the accessibility of people bicycling to and from the site and adjoining areas. The methodology should assess to the extent applicable:

- The presence of nearby bicycle facilities (e.g., proximity to San Francisco's Bikeway Network), taking into account the presence of any physical features that obstruct bicycle facilities
- The number of project vehicle trips, including freight and service vehicle trips, travelling in and out of project facilities and the ability for such facilities to accommodate those vehicle trips in relation to the number of people bicycling at those locations and nearby streets [text, figure]

Existing Baseline

Refer to the guidelines for direction on including existing baseline in transportation studies.

Impact Analysis

This section ties the project description, methodology, and existing baseline together to address the significance criteria for existing plus project conditions. This section addresses the typical approach for the impact analysis and provides more details related to hazards and accessibility impacts for people bicycling. The impact analysis section should present a format (text, figure, or table) consistent with earlier sections of this memorandum for easy comparison.

The impact analysis must address whether the project would create potentially hazardous conditions for people bicycling and whether the project interferes with accessibility of people bicycling to the site and adjoining areas. Too many factors mentioned in the methodology affect the potential for hazardous

conditions and for interference with accessibility. Instead, the department will determine significance on a project-by-project basis.

Refer to the guidelines for direction on what to consider when conducting the existing plus project impact analysis and how to present the findings. The subsections below provide specific examples of the types of circumstances that could result in a potentially hazardous condition impact or accessibility impact under existing plus project conditions.

Potentially Hazardous Conditions

The following examples are some of the circumstances that may result in potentially hazardous conditions to people bicycling. This is not an exhaustive list of circumstances under which potentially hazardous impacts would occur:

- A project would add a substantial number of moving vehicle trips (e.g., curb cut width, turning movement) across a bicycle facility (e.g. part of San Francisco's Bikeway Network) used by a substantial number of people bicycling (e.g., based on counts, or projections)
- A project would construct or be located on a lot with physical obstructions (e.g., trees, utilities, and on-street parking directly adjacent to the curb cut or transit stop) or slopes that would obstruct sightlines between a substantial number of people bicycling and people driving at high speeds
- A project would add a substantial number of vehicle trips (i.e., exacerbate) to a turning movement (e.g., left vehicular turn without a protected phase) that is an existing hazard (e.g., High Injury Corridor) for a substantial number of people bicycling
- A project would facilitate a substantial number of vehicle trips by removing facilities designed to protect a substantial number of people bicycling (e.g., plastic safe-hit posts, channelized turns)
- A project would be unable to accommodate[4] vehicle trips, including freight and service vehicle trips, into its off-street facilities thereby blocking access to bicycle facilities for a substantial number of people bicycling resulting in people bicycling into a mixed-flow travel lane with vehicles travelling at high speed differentials than people in the bicycle facility
- A project would modify a physical feature in the roadway that may create a hazardous condition for a substantial number of people bicycling (e.g., modification of a curb in which people bicycling may strike)
- The number and movement type of project-generated vehicle trips into or out of a loading zone across an area frequently used by people bicycling (i.e. supported by counts or observations) or a bicycle facility (e.g., part of San Francisco's Bikeway Network)

Accessibility

The following examples are some of the circumstances that may interfere with accessibility. This is not an exhaustive list of circumstances under which potential accessibility impacts would occur:

[4] Accommodate refers to design of the facility (e.g., can vehicles be accommodated without queuing based upon throat length, gate location, etc.) and not the capacity (e.g., does the number of spaces accommodate the demand) of the facility as many variables affect the demand to and from a facility.

- A project would be unable to accommodate[5] vehicle trips, including freight loading and service vehicle trips, into its off-street facilities thereby blocking access to bicycle facilities used by a substantial number of people bicycling
- A project places a structure (e.g., large building, right-of-way encroachments) that closes off or renders existing facilities for people bicycling challenging to use, without providing replacement facilities or alternative routes of compatible nature[6], and substantially increases distances for people bicycling to safely connect to San Francisco's Bikeway Network or access neighborhoods and major destinations

CUMULATIVE

Methodology

The guidelines detail the typical methodology for cumulative analysis, including the geographical area, period, cumulative projects, and adjustments (refer to Appendix B) under cumulative conditions. The cumulative section in transportation studies must present (text, figure, or table) the applicable elements included in the methodology.

Impact Analysis

This section ties the methodology and description of cumulative conditions together to address the significance criteria for cumulative conditions. Refer to the guidelines for direction on what to consider when conducting the cumulative impact analysis and how to present the findings. The same examples of the types of circumstances that could result in a potential hazardous condition impact or accessibility impact that were provided for existing plus project conditions apply here, except for cumulative conditions.

OTHER

The guidance provided in this memorandum assumes a land use development project located outside of an area plan that requires a transportation impact study. This section describes the type of additional or different information that may be necessary to address bicycling impacts for the following circumstances: land use development project located within an area plan, an area plan, or infrastructure project (which may be located in a different county than San Francisco).

Land Use Development Project Located within an Area Plan

For projects that are consistent with an area plan for which an environmental impact report (EIR) was certified, pursuant to CEQA guidelines section 15183, the assessment must limit its analysis to such conditions specified in that section. The guidelines provide direction on how to analyze a land use development project in an area plan and a list of area plan EIRs that have been certified as of February 2019.

Attachment B of this memorandum identifies mitigation and improvement measures from area plan EIRs related to people bicycling. The department will list bicycling-related mitigation and improvement measures from future area plan EIRs in Attachment B after the Planning Commission or Board of Supervisors certifies those EIRs.

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[5] *Ibid.*

[6] Factors such as incline, volume of vehicles, vehicle speed, and street lighting should be used to assess compatibility of alternative bicycling routes.

Area Plans

For area plans, the assessment will typically use the significance criteria identified herein. The following subsections describe the type of additional or different information that may be necessary to address bicycling impacts for area plan projects, methodology, and impact analysis. For area plans that also include infrastructure changes (e.g., street redesigns), please see the Infrastructure Project subsection for additional or different information that may be necessary.

Project Description

Typically, the department conducts an analysis to project the amount of future development that could occur in the plan area as a result of its implementation. The department typically does not have all the project description details described herein. However, the project description may include policies that may relate to the methodology and impact analysis (e.g., curb cut restrictions).

Methodology

The assessment will typically use the same methodology identified herein, except the methodology will use a larger geographical study area and require less site-specific information (e.g., driveway locations at each site) except to document circumstances where vehicles may not be allowed (e.g., curb cut restrictions). While an individual project may not require some elements listed in the Existing and Existing plus Project Methodology subsection, area plans typically will include all of these elements. The department should select sidewalks, streets, and intersections most impacted by the area plan to represent the impacts that may occur at other locations.

Impact Analysis

For analysis of area plans, assess the projected amount of growth and infrastructure changes associated with the rezoning within the area plan boundaries. The analysis of potentially hazardous conditions and accessibility impacts should be similar to that described under the Existing plus Project and Cumulative Impact Analysis subsections. If the area plan includes infrastructure changes (e.g., street redesigns), given the potential time gap between land use development and completion of infrastructure changes, the analysis should discuss the potential short-term effects of that potential time gap in a lesser level of detail than that provided for overall effects. However, the analysis should assume individual land use development projects within the area plan would be subject to requirements related to property specific infrastructure changes (e.g., Better Streets Plan).

Examples of circumstances that would result in significant impacts are described under the Existing Plus Project Impact Analysis subsection.

Infrastructure Project

For infrastructure projects (e.g., trails, new roads, bridge repair, sewer line, rail service, roadway modifications, etc.), the assessment of the project description, significance criteria, and impact analysis should be similar to private development projects. The analysis typically does not require trip generation analysis as infrastructure projects usually do not generate trips.[7] However, some infrastructure projects may induce trips, such as the addition of through lanes on existing or new highways or streets.[8] In

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[7] Governor's Office of Planning and Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA,* January 20, 2016.

[8] Generally, minor transportation projects would not result in additional trips. Examples include, but are not limited to, rehabilitation, maintenance, and repair of transportation infrastructure; installation, removal or reconfiguration of non-through

addition, infrastructure projects may generate short-term trips due to construction workers and vehicles accessing the project site.

Project Description

The project description must describe the typical physical, additional physical, and programmatic features for existing and project conditions, as applicable. The project description must provide the geographic boundaries of the project and street cross sections.

Methodology

The assessment will typically use the same methodology identified herein, except the methodology will pay particular attention to proposed closures and rerouting.

Impact Analysis

The analysis of potentially hazardous conditions and accessibility impacts should be similar to that described under the Existing plus Project and Cumulative Impact Analysis subsections.

Potentially Hazardous Conditions

Examples of circumstances that would result in significant impacts are described under Existing plus Project Impact Analysis subsection. The following examples are some of the additional circumstances relevant to infrastructure projects, which may result in potentially hazardous conditions. This is not an exhaustive list of circumstances under which potentially hazardous impacts would occur:

- A project would install an obstruction (e.g., utility covers, streetcar tracks, drain grates, Bay Area Rapid Transit /Muni grates) within or across a bicycle facility used by a substantial number of people bicycling without adequate space to navigate around or notification measures to alert the people to the obstruction
- A project would modify or introduce a design feature in the public right-of-way that would either directly or indirectly inhibit the ability of people bicycling to safely navigate between various sections of the public right-of-way (i.e., roadway to shoulder)
- A project would include a geometric design feature (e.g., roadway or ramp widening, wide mixed-flow travel lanes, large curb radii) such that a substantial number of moving vehicle trips would occur adjacent to or across bicycle routes without protection (e.g., buffer, physical feature, speed reductions) between the vehicle trips and a substantial number of people bicycling

Accessibility

Examples of circumstances that would result in significant impacts are described under Existing Plus Project Impact Analysis subsection. The following example is an additional circumstance relevant to infrastructure projects, which may interfere with accessibility. Accessibility impacts not listed below could occur under other circumstances:

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traffic lanes and traffic control devices; removal of through lanes; installation of traffic calming measures and wayfinding; removal of on- or off-street parking. Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA,* November 2017.

- a project would establish a new physical structure (e.g., at-grade rail service or roadway) which would result in inadequate access for substantial number of people bicycling to and from nearby routes identified as part of San Francisco's Bikeway Network and major destinations (e.g., diverting people bicycling to an incompatible route that would result in an unreasonable increase in incline or distance, or having people wait extensively at crossings)

ATTACHMENT A

Existing and Proposed Project Figure and Table Examples

Introduction

Attachment A represents typical figures necessary to illustrate bicycling conditions included in a transportation study. All figures should include basic elements (e.g., north arrow, title, legend, references, acronyms, etc.). Symbology should reflect that documents may be printed in black and white. All figures and tables should include all the information the reader would need to understand the information presented. The figures presented below were from previous transportation studies and are illustrative only and may not include all the basic elements

FIGURE 1

Site Plan/Ground Floor Plan

Figure 1 is an example of a site plan that includes a detailed description of existing and proposed on-street loading. When developing a map similar to the one shown, include the linear dimensions of the existing and proposed loading zones, match the color of the zones to those used in the SFMTA Color Curb Program, and make existing and proposed changes explicit.

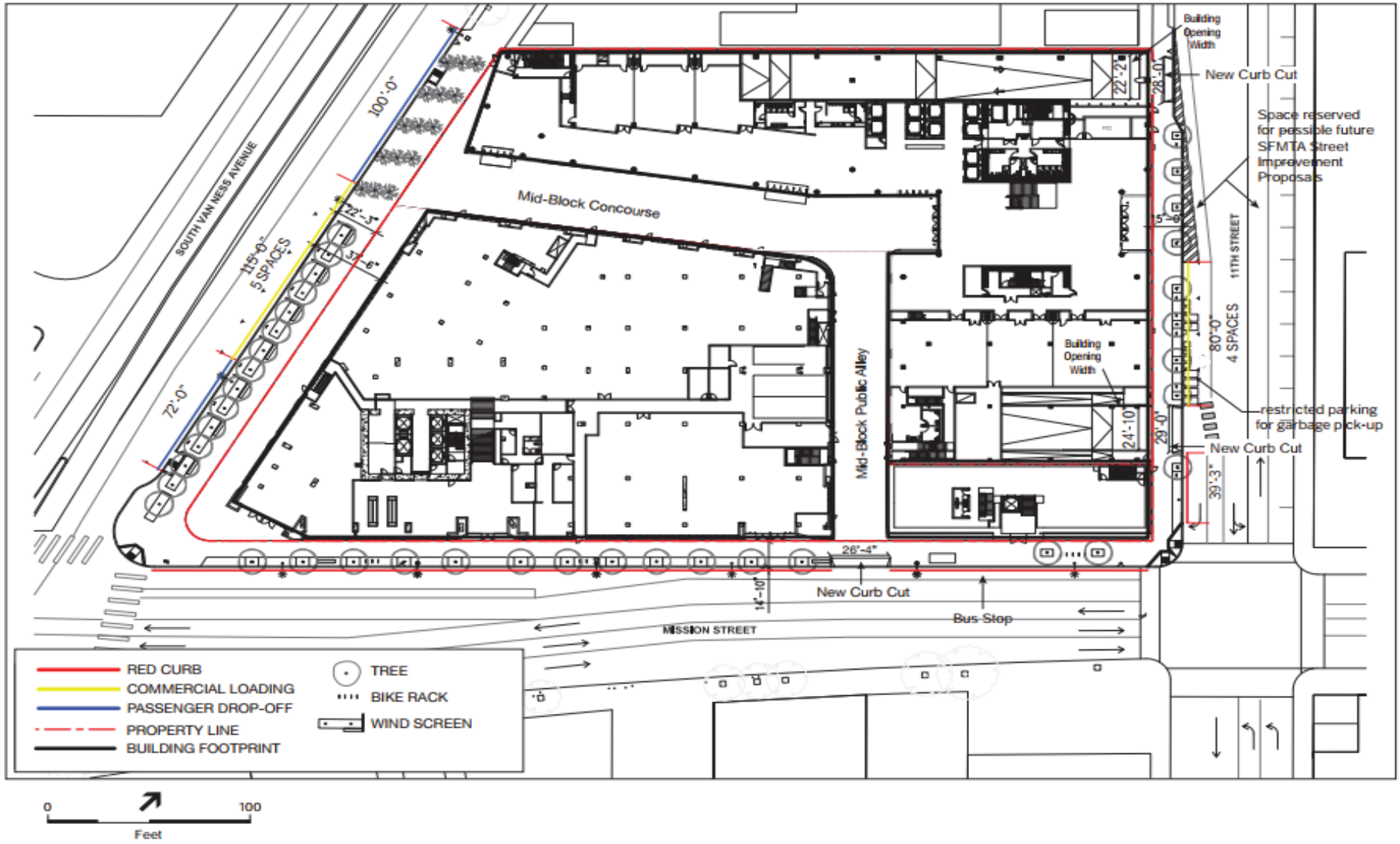

FIGURE 2

Bicycling Circulation

Figure 2 shows a bicycling circulation map, including circulation from surrounding streets and internal circulation.

TABLE 1

Peak Hour Counts for People Bicycling at Study Intersections

Table 1 below shows the typical format to present counts of people bicycling at all identified project intersections/ street segments. 'X' represents the volume of people bicycling that were observed during counts.

Intersection	Intersection Leg Counts at Peak Period (INSERT TIME)				TOTAL
	North	South	East	West	
Intersection 1	x	x	x	x	x
Intersection 2	x	x	x	x	x
Intersection 3	x	x	x	x	x
Intersection 4	x	x	x	x	x

FIGURE 3

Walking Network

Figure 3 is an example of mapping the existing network as it relates to people bicycling within a project study area. Inclusion of the bicycle facilities identified in this map near a specific project site would be appropriate in the Existing Baseline section.

ATTACHMENT B

Mitigation and Improvement Measures

MITIGATION MEASURES FOR LAND USE DEVELOPMENT PROJECTS LOCATED WITHIN AN AREA PLAN

Eastern Neighborhoods Rezoning and Area Plan

***Mitigation Measure E-3:** Enhanced Funding*
As a mitigation measure to adequately address the growth in automobile traffic generated by the Eastern Neighborhoods rezoning, ensure that sufficient operating and capital funding is secured for congestion management programs to make more efficient uses of ramps, streets, and parking, as well as funding to sustain alternative transportation (transit, bicycle, pedestrian) network and programs that provide incentives for drivers to use these modes.

Rincon Hill Plan

No applicable mitigation or improvement measures were identified.

Market and Octavia Neighborhood Plan

No applicable mitigation or improvement measures were identified.

Visitacion Valley Redevelopment Plan

No applicable mitigation or improvement measures were identified.

Balboa Park Station Area Plan

No applicable mitigation or improvement measures were identified.

Treasure Island and Yerba Buena Island Redevelopment Plan

No applicable mitigation or improvement measures were identified.

Glen Park Community Plan

No applicable mitigation or improvement measures were identified.

Transit Center District Plan and Transit Tower

No applicable mitigation or improvement measures were identified.

Western SoMa Community Plan

No applicable mitigation or improvement measures were identified.

Central SoMa Plan

No applicable mitigation or improvement measures were identified.

MITIGATION AND IMPROVEMENT MEASURE EXAMPLES

The following lists the typical types of measures that can mitigate or lessen impacts to people bicycling for each significance criterion:

EXAMPLE 1 Potentially Hazardous Conditions

- Facilitate safe crossings (e.g., stop-controlled intersections, installation of signal heads with countdown timers; installation of audible warning devices, pedestrian safety islands, bicycle-only traffic control devices);
- Establish safe sight distances (e.g., daylighting);
- Widen existing bicycle facilities (or install bicycle facilities where none exist);
- Roadway design changes intended to slow vehicle speeds such as traffic calming measures (e.g., bulb-outs, chicanes, speed humps, tighter turning radii);
- Relocate bicycle facilities away from off-street garage/loading docks;
- Install visible and/or audible warning devices at garage entrances/exits to alert people bicycling and people driving of activity at the garage driveway;
- Provide on-site signage promoting safety for people bicycling (e.g., signage at the garage exit reminding motorists to slow down and yield to people bicycling);
- Coordinate freight and service deliveries to reduce conflicts with people bicycling adjacent to on-site and off-site loading zones; and
- Prevent, monitor, and abate project-generated vehicle queues (see sample language below).
- Signal changes such as reducing signal cycle lengths to less than 90 seconds or leading pedestrian/bicycle intervals.

EXAMPLE 2 Accessibility

- Employ Queue Abatement Measures or pursue design modifications to proposed garage entrances/exits to accommodate queuing vehicles (see next page for Queue Abatement Sample Language)
- Provide adequate (e.g., effective widths, paths of travel) bicycle facilities adjacent to the project site, and/or network improvements such as crosswalks, shorter blocks, mid-block crossings, mid-block alleys, or a pedestrian/bicycle bridge or underpass, between the project site and intersections, adjacent transit stations/stops, and other major destinations.