FINAL SAR 02-3

STRATEGIC ANALYSIS REPORT

on Transportation System Level of Service (LOS) Methodologies

Initiated by Commissioner McGoldrick
Adopted by the Authority on December 16, 2003

TABLE OF CONTENTS

I. Background 1
II. Issue 2
III. Review of Other Documents 3
IV. Strategic Analysis 4
A. Current LOS Methods 5
B. LOS Methodology 6
C. LOS Policy 7
V. Recommendations/Next Steps 10
VI. Bibliography/Sources Consulted 11
VII. Authority Staff Credits 12

I. BACKGROUND

Summary

The primary conclusions of the SAR are 1) auto LOS methods should be complemented with improved impact analysis methodologies for all modes as well as for the street system as a whole, and 2) impact significance standards should be redefined. These changes would improve the ability of local transportation impact analyses under CEQA to support San Francisco's existing multimodal transportation and environmental policies. The SAR identifies an array of recommendations for establishing a more transparent and sophisticated set of multimodal LOS measures, and includes suggestions for applying these measures in the screening and evaluation stages of transportation impact analysis. If the Authority Board wishes to recommend revisions to current City LOS standards and methodologies, the Authority Board should convene a technical working group (TWG) including representation from the Planning Department Office of Major Environmental Assessment, MUNI, DPT, industry practitioners, and representatives of user groups as appointed by the Executive Director. Opportunities should be ensured for public review of the LOS TWG's work. The LOS TWG would refine the SAR's recommendations for Authority Board approval and action in two phases, at six and twelve months.

About SARs: Purpose of Document

This Strategic Analysis Report (SAR), initiated at the request of Commissioner McGoldrick, briefly analyzes of Level of Service (LOS) methodologies and standards in the CEQA environmental impact assessment context. Revisions are recommended to more consistently translate San Francisco's multimodal transportation policies into measures of, and standards for, impacts on transportation.

This SAR is designed to inform policy-level decision-making by the Authority Board. Technical discussion has been condensed, and only the facts essential to outline the policy-level issues are included. Additional information is available from the sources cited, or by calling Tilly Chang, Manager of Planning, at (415) 522-4832.

Level of Service, one of the most common measures of transportation performance, is a conventional traffic engineering tool that quantifies the adequacy of roads and freeways to serve traffic demand. LOS is commonly used to evaluate the performance of entire transportation systems, corridors, and projects. The City uses LOS as a measure of impacts on the transportation environment from development and other projects. This SAR focuses on the use of LOS measures to evaluate, in the environmental review context, the impacts of proposed transprotation projects on transportation facilities. The implications for development projects are discussed briefly.

II. THE ISSUE

The City of San Francisco uses LOS measures in the CEQA process to define and predict the impacts of proposed projects at a specific point on the transportation system. LOS methodologies guide the City's transportation impact analysis of proposed projects at two points: in screening for possible impacts, and during evaluation of likely impacts.

Current Transportation Impact Screening Process

Project sponsors forward projects to the Planning Department for environmental review. The Planning Department then screens projects in order to gauge the likelihood of significant negative environmental impacts resulting from a proposed project, and to determine the type of environmental review the project requires. The Planning Department's Guidelines for Environmental Review list typical screening criteria; other criteria are based on past environmental review practice (i.e., previously approved environmental review documents) and are not set forth in the Guidelines. The list of Screening Criteria from the Guidelines for Environmental Review is included as Appendix A. The Guidelines document is not a formally adopted document that has been approved through a public process.

Project sponsors perceive that a transportation project with certain design features - such as a bicycle lane requiring removal of an existing traffic lane - will trigger the need for further environmental review although this is not a formal published criteria.

Published Screening Criteria for Transportation Impacts
• Increase of 50 PM peak person trips • Traffic increase of 5% or more • Nearby intersections at auto LOS D would be impacted • "…the project has elements which have the potential to adversely affect" transit operations or capacity • "… the project has elements which have the potential to adversely affect pedestrian or bicycle safety" or facility adequacy
Source: Guidelines for Environmental Review. The Planning Department objected to this summary; for their description of screening criteria please see Appendix A

From a project sponsor perspective, on certain streets, lane removal functions as a "de facto" criterion because removal of a traffic lane usually decreases motor vehicle LOS and decreases resulting in auto LOS E or F are defined as significant in environmental terms.

Under CEQA, a project with potential significant impacts, as indicated by the screening process, must undergo environmental review. Completing a full environmental review is significant in transportation planning because the review process can impede the implementation of a project. Although environmental review is essential when impacts may be serious, the review process extends a project's schedule and increases its cost. In the case of bicycle projects, this cost can easily surpass the cost of implementing the project itself. Projects which may trigger a Planning Department screening criterion may not advance to the planning stages due to the time, budget, and project feasibility barriers created by transportation LOS impact standards.

"LOS METHODOLOGIES GUIDE THE CITY'S TRANSPORTATION IMPACT ANALYSIS OF PROPOSED TRANSPORTATION PROJECTS AT TWO POINTS: IN SCREENING FOR POSSIBLE IMPACTS, AND DURING EVALUATION OF LIKELY IMPACTS."

Current Transportation Impact Evaluation Process

To evaluate transportation impacts, expected project effects on transportation LOS are forecast and compared to LOS significance thresholds. The LOS measures and significance standards are published in each transportation impact analysis report prepared by the Planning Department (See Appendix B). The LOS standards are not published in the Guidelines for Environmental

Review, nor has the Planning Commission formally adopted standards for significant impact. The City could adopt thresholds of significant impact by ordinance, resolution, rule, or regulation (CA Guidelines Sec 15064.7).

Current Published Impact Standards	
Auto	LOS "E"
Transit	TLOS "E" (load factor .80) - MUNI
Pedestrian	No clearly defined standard
Bicycle	No clearly defined standard
Source: SF Planning Department. The Planning Department objected to this summary; for a full description of impact standards, see Appendix B	

The City defines LOS separately for each mode, and some LOS measures are more clearly defined than others. Impacts to auto users are the most well-defined measure: seconds of motor vehicle delay at intersections (according to the conventional Highway Capacity Manual intersection LOS methodology). The City has also outlined measures to assess the impacts of proposed projects on transit, pedestrian, and bicycle LOS. The measure of transit LOS compares the capacity of one or more transit lines in the vicinity of the project with the projected transit demand for that direction of travel. This ratio is called the "load factor," and is essentially an average measure of crowding on transit vehicles at a point in the network. No standards are set forth in the Planning Department's summary of impact standards, though a load factor of .80 (Transit LOS "E") has been published by MUNI as their standard.

Pedestrian LOS is evaluated using a similar "crowding" measure that estimates the amount of usable sidewalk space per pedestrian, and is supplemented by a qualitative evaluation of safety. Bicycle LOS is assessed either qualitatively or with a "crowding" measure (amount of dedicated bicycle space per bicyclist).

Significance levels for auto and transit LOS are generally guided by a grade scale from "A" to "F" which rates the extent of crowding or delay predicted with and without the project. In general, a LOS "E" grade triggers the motor vehicle and transit threshold levels of significance. While LOS measures are discussed generally in published documents as described above, no clearly defined standards for significant impact for these modes have been developed to date.

Projects with findings of significant impacts require a statement of overriding considerations (for specific economic, legal, social, or technological reasons) to approve the project if, after preparation of an EIR, the impact cannot feasbly be mitigated or reduced to less than significant. The use of the statement of overriding considerations is available as a last resort for approving desirable projects with negative impacts, e.g. on auto LOS. The Planning Department has attempted to minimize the burden of environmental review processes for projects as provided for by current CEQA guidelines, through the use of exemptions, general rule exclusions, and simplified negative declarations. However, given constrained roadway rights of way and strict standards for motor vehicle LOS, these requirements can make improvements to other modes difficult to implement. The next generation of transit service upgrades and bicycle and pedestrian safety facilities will require these right of way reallocations which will have a significant negative environmental impact on transportation under current standards.

III. REVIEW OF OTHER DOCUMENTS

This section reviews transportation plans, policies, and other documents that constitute existing LOS policy ifor the environmental review of transportation projects.

CEQA Statutes and Guidelines

The state CEQA statute and the California Resources Agency's State CEQA Guidelines offer criteria for determining when a proposed project requires environmental review, and steps to follow in determining whether a project has a significant effect on the environment. Within this framework, cities set their own screening criteria, thresholds of significance, and methodologies to determine the expected impacts of a project, as well as what actions may be taken to mitigate significant environmental impacts.

"...EXEMPTIONS... ARE NOT ABSOLUTE. IF A CITY DETERMINES THAT A CATEGORICALLY EXEMPT PROJECT MAY IN ONCE INSTANCE HAVE SIGNIFICANT ENVIRONMENTAL IMPACTS, THE CITY CAN REQUIRE ON A CASE-BY-CASE BASIS THAT THE PROJECT UNDERGO ENVIRONMENTAL REVIEW."

For example, state statute provides for "categorical exemptions" to CEQA, and even exempts some projects by statute. Categorically exempt classes of projects (a class of projects exempt from CEQA because such projects generally will not have a significant impact on the environment) are set forth in the state Guidelines. Local agencies may also adopt classes of categorically exempt projects. However, categorical exemptions are not absolute; if a city determines that a categorically exempt project may in one instance have significant environmental impacts, the city must prepare a mitigated negative declaration or EIR, as appropriate.

Transportation Impact Analysis Guidelines for Environmental Review (October 2002)

The San Francisco Planning Department's Guidelines implement CEQA statutes locally by translating General Plan transportation policies into measures of, and standards for, impacts on the transportation environment. The Guidelines provide a methodology for estimating potential project impacts on the LOS of all modes, and list screening criteria for projects which may have a significant effect on the transportation environment. They

do not specify standards of significant impact on transportation, which are instead described in transportation impact reports prepared by the Planning Department.

San Francisco General Plan

The San Francisco General Plan is the policy foundation for transportation impact analysis and includes clear guidance on the use of performance measures for transportation analysis. Objective 10 of the San Francisco General Plan directs the City to "develop and employ methods of measuring the performance of the City's transportation system that respond to its multimodal nature."

More specifically, Policy 10.1 directs the City to "assess the performance of the city's transportation system by measuring the movement of people and goods rather than merely the movement of vehicles. There are a variety of indexes that measure the comprehensive variety of travel modes in San Francisco better than Level Of Service." Finally, in support of the City's Transit First policy, the General Plan provides for mitigating project negative impacts on motor vehicle LOS by improving other modes in the city's transportation system.

"..GENERAL PLAN OBJECTIVE 10, POLICY 10.1, DIRECTS THE CITY TO ASSESS THE PERFORMANCE OF THE CITY'S TRANSPORTATION SYSTEM BY MEASURING THE MOVEMENT OF PEOPLE AND GOODS RATHER THAN THE MOVEMENT OF VEHICLES ....."

Highway Capacity Manual 2000

The first Highway Capacity Manual introduced vehicle-delay and volume-to-capacity based LOS measures during the development of the Interstate highway system in the 1950s. Originally developed to size highways, this manual has become the main professionally accepted reference for traffic engineers. The latest edition of the Highway Capacity Manual (HCM) 2000 provides LOS methodologies for all modes.

San Francisco Bicycle Plan (1997)

The City's 1997 Bicycle Plan recommended exempting bicycle projects from congestion management monitoring (this outcome is made possible in part by SB 1636, described below). The Plan recommended more rigorous review of the impacts of proposed projects on bicycle travel; counts and inventories; and consistent standards of significant impact on bicycles (though it did not suggest specific methodologies or standards). The City's Bicycle Master Plan is undergoing an update with a target completion for summer 2004. Additional upfront time and resources would be needed to complete a Master EIR on the Plan.

Congestion Management Program (CMP)

The 1989 State Congestion Management Program (CMP) legislation requires that county congestion management agencies (in San Francisco, the Authority) monitor motor vehicle LOS and develop multimodal transportation performance measures.

California Senate Bill 1636, signed into law in September 2002, amended Section 65088 of the Government Code relating to Congestion Management. Cities or counties may now designate "infill opportunity zones" in which streets and highways are exempt from level of service standards set forth in the CMP. Local governments that designate such zones must either apply an alternative LOS measure in lieu of conventional methodologies, or adopt flexible mitigation measures. However, CMP policies and methodologies do not have bearing on the environmental review of transportation projects, since the legislation mandating each type of review is entirely separate with distinct objectives. Projects proposed within an Infill Opportunity Zone would remain subject to CEQA review, and the LOS measures and standards set by the City pursuant to CEQA.

"..CEQA LETS CITIES DEFINE SIGNIFICANT IMPACT, SET THEIR OWN SCREENING CRITERIA, AND ESTABLISH THEIR OWN METHODOLOGIES FOR MEASURING IMPACTS, AS WELL AS IDENTIFY THE ACTIONS THAT MAY BE TAKEN TO MITIGATE SIGNIFICANT IMPACTS ....."

IV. STRATEGIC ANALYSIS: FINDINGS

San Francisco's development pattern and mature grid street network mean that tradeoffs among the various modes using City streets are frequent. Rights-of-way conflicts are resolved through technical analyses within the context of governing policy frameworks.

San Francisco should implement CEQA requirements through evaluation tools, such as LOS measures, that translate the local multimodal transportation and environmental policy into impact evaluation mechanisms. State CEQA statutes let cities define significant impact, set their own screening criteria, and establish their own methodologies for measuring impacts, as well as identify the actions that may be taken to mitigate significant impacts. Cities must support their decisions with substanitial evidence in the record.

San Francisco's transportation impact standards and measures should:

1. Be customer-based: that is, capture relevant aspects of the travel experience for all modes;
2. Support system-efficiency and a quality transportation environment for streets as a whole, not just individual modes; and
3. Capture benefits: that is, be capable of reflecting both the service and environmental impacts and benefits of a project (in the sense of environmental benefits that decrease impacts, as well as long term benefits but short

term impacts on the same environmental system).

Of course, evaluation methods need practical data and resource requirements. The methods should be transparent, replicable and consistently applied.

This section analyzes current LOS methodologies in three parts. Part A discusses the technical adequacy of current City LOS methodologies to represent a project's relationship to environmental conditions and implement City policy objectives. Part B offers options for improving the LOS methodologies, and Part C examines ways to strengthen the policy framework to guide the proposed changes.

"...EXISTING LOS MEASURES AND STANDARDS OSTENSIBLY FAVOR PRESERVING AUTO LEVEL OF SERVICE AT THE EXPENSE OF IMPROVING TRANSIT, BICYCLE, AND PEDESTRIAN CONDITIONS."

A. Current Level of Service Methodology

Conventional LOS measures as currently applied do not support the General Plan policy guidance toward development of a balanced, multimodal transportation system. Because CEQA analyses imply that baseline conditions are acceptable, changes that noticeably impact the "incumbent" transportation system are considered significant environmental impacts. As a consequence of the dominance of the automobile in San Francisco travel patterns, and current standards of significance, current LOS standards and measures:

1. Lack sufficient incorporation of the factors most important to transit riders, bicyclists, and pedestrians, and guidance to project sponsors and decision makers on how to comparably present impacts;
2. Do not promote system-efficiency from system owner-operator perspective, or the functioning of streets as a whole in the system, independent of individual modes;
3. Do not convey existing "deficits" in the baseline transit, bicycle, or pedestrian environments, or provide limited acknowledgement of environmental benefits of transit, bicycling, and walking.

Consequently, existing LOS measures and standards ostensibly favor preserving motor vehicle LOS at the expense of improvements transit, bicycle, and pedestrian LOS. Local transportation impact standards and measures which support San Francisco's General Plan should address the three considerations above.

The Incumbent Mode Problem

Motor vehicle LOS methodology is well established in the transportation practice, and this contributes to the "incumbency" of the automobile. In contrast, San Francisco's LOS measures and standards for transit, bicycles, and pedestrians are not as comprehensive nor well defined. Current measures of LOS for transit, bicycles, and pedestrians do not reflect all of the factors most important to the quality of transit, bicycle, or pedestrian experience. Instead, they apply the motor vehicle LOS measure to these alternative modes: the volume of trips on that mode relative to the capacity of the transportation facility serving that mode. Existing MUNI and BART "load factor" methodologies, used by the City of SF as transit LOS measures, estimate the crowding on transit vehicles. The City's pedestrian LOS methodology, for instance, defines pede trian LOS as the ratio of sidewalk area to volume of pedestrians.[1] By this measure, a near-empty sidewalk provides a high level of service.

Although crowding is one measure of attractiveness of a mode, other aspects of transit, bicycle, and pedestrian travel are more important to the quality of the service as perceived by the user. For transit, these factors include reliability and frequency of service. For bicyclists and pedestrians, they include safety from vehicular conflicts, especially at intersections, and other aspects of comfort and safety.[2] Travel time and network connectivity are important for all these modes. "Crowding" based methodologies do not reflect these aspects of modal LOS.

Although in practice transportation impact analyses attempt to discuss delay, safety, accessibility, and other conflicts, San Francisco needs more appropriate measures and standards for the transit, bicycle and pedestrian environments on city streets. Their absence impairs the reporting of impacts on these modes and decisionmakers' ability to weigh project improvements to LOS of one mode, when those improvements impact on the LOS of another. More appropriate LOS methods for the transit, bicycle and pedestrian modes would also guide project designs to be more sensitive to the needs of these modes up front in the project development process.

"...DEFINING LOS FOR ALL MODES WOULD ALLOW LOS STANDARDS TO BE DESIGNATED FOR ALL MODES, AND THEN EVALUATED CONSISTENTLY."

Current LOS methods are not well developed to support systems-level analyses. Because impact analysis methodologies are most well developed for intersection-level, quantified, auto LOS measures, the projects that perform best under current LOS methods and standards are those that optimize the transportation systems for the movement of vehicles (rather than people and goods). This can lead to decisions that prioritize projects serving low-occupancy auto trips over more efficient transit services or transit, bicycle or pedestrian network development projects.

Finally, although this SAR focuses on the transportation analysis under CEQA, the motor vehicle analysis from the transportation section does serve as an input to other CEQA sections, such as air quality (as required by the Bay Area Air Quality Management District) and energy. The methods used to evaluate impacts do not consider the person-trips that are served by vehicles, only the impacts of vehicles themselves. This effect is fur-

1 HCM and Pushkarev/Zupan methodologies

2 These are important service attributes for auto users as well, though the auto mode implicitly provides for a relatively safe and comfortable experience.

ther exacerbated by the scant acknowledgement of beneficial environmental impacts of transportation projects, and particularly non-motorized transportation projects. Such benefits include the improved amenity or safety of travel, and zero-emission/renewable energy attributes of walking and cycling, The long-term air quality and energy benefits of better use of transit, walking and cycling are not reflected measurably.

Finally, because San Francisco has a mature road network and finite public rights-of-way, it is easy to assume a priori that many bicycle, pedestrian, and transit improvements cannot be implemented without impacting motor vehicle LOS. In fact, when vehicle capacity is reduced, trip patterns have a tendency to adjust either in terms of the absolute vehicle trips that are made or the time or route of trips.[3] This is especially so when attractive alternate modes or routes are available.

Due to San Francisco's mature road network, the next generation of multi-modal transportation improvements to transit, pedestrian, and bicycle facilities - pedestrian bulbs at intersections, dedicated transit and bicycle lanes - will increasingly call for decision-makers to consider re-allocating existing street capacity from motor vehicle or shared uses to pedestrian, bicycle, or transit use. To support such decision-making, it is important that transportation impact standards reflect local transportation and environmental priorities, and that evaluation methodologies are capable of supporting trade-off analysis between auto and other users, as well as informing system level analyses.

"...IT IS IMPORTANT THAT TRANSPORTATION IMPACT STANDARDS REFLECT LOCAL TRANSPORTATION AND ENVIRONMENTAL PRIORITIES, AND THAT EVALUATION METHODOLOGIES ARE CAPABLE OF SUPPORTING TRADE-OFF ANALYSIS BETWEEN AUTO AND OTHER USERS, AS WELL AS INFORMING SYSTEM EFFICIENCY ANALYSIS."

San Francisco requires a multimodal impact evaluation process and tool that can "assess the performance of the city's transportation system by measuring the movement of people and goods rather than merely the movement of vehicles,"[4] and can inform decisions about which mode(s) of transportation to prioritize on constrained public rights of way. Current LOS measures are inadequate for determining which projects advance the City's transportation objectives with minimum negative environmental impact. Rather than expanding the cost and delay of implementing San Francisco's next generation of multimodal transportation improvements by preparing EIRs, only to approve the projects with statements of overriding considerations, the City should revise measures and standards of significant impacts to reflect already existing policies and avoid unnecessary barriers.

The next section describes LOS methodologies and process that, where environmental impact assessment for transportation projects is warranted, more fairly assess the impacts and benefits of projects on all modes of transportation.

B. Alternate Level of Service Methodologies

A revised LOS methodology should define LOS for all modes in terms that enable comparisons of changes in LOS across modes and reflect potential project benefits, as well as impacts. Defining LOS for all modes would also allow LOS standards to be designated for all modes, and applied consistently.

Customer-Based Multimodal LOS Methodologies

"...THE CITY'S DEFINITION OF SIGNIFICANT TRANSPORTATION IMPACT SHOULD BE CLARIFIED AND REVISED TO MORE CONSISTENTLY IMPLEMENT GENERAL PLAN POLICY."

For the City's various agencies involved in providing transportation services and facilities, drivers, bus riders, bicyclists and pedestrians are customers. To reexamine how customers are served, the City needs a customer-based methodology that is centered on those things most important to users of the system. Measures of transit, bicycle, and pedestrian LOS that only measure crowding are too narrow to capture the variables most important to transit riders, bicyclists, or pedestrians (such as reliability, travel time, and safety).

A customer-centric transportation impact evaluation methodology does not need to be invented from scratch; a number of customer-based, multi-modal methodologies have been developed. The City should tailor existing methods developed elsewhere to San Francisco's context. Professional transportation groups and agencies, such as Transportation Research Board, the Federal Highway Administration, and the Institute of Transportation Engineers, have proposed alternative methods. Palo Alto and Chula Vista are two California cities developing multimodal LOS standards; cities in other states such as Florida have already done so. Alameda County is exploring designations of auto LOS beyond "F."

A user-based LOS measure should provide a picture of how LOS would change for each mode in response to a particular project, whether that change in LOS is an improvement (e.g., improvements to transit LOS, in terms of reliability or travel time, from transit preferential treatments) or negative impact.

Some existing multimodal LOS methodologies are summarized in Appendix D. Several alternate measures standardize and quantify bicycle, transit, and pedestrian LOS, including difficult to quantify elements such as safety. Some others take the form of checklists or relatively qualitative indexes. No existing method may be ideal for San Francisco; an interdepartmental working group would need to assess existing methods and recommend a

3 Goodwin, Phil; Carmen Hass-Klau and Sally Cairns. 1998. "Evidence on the effects of road capacity reduction on traffic levels." Traffic Engineering and Control.
4 General Plan Transportation Element Policy 10.1

tool appropriate for the San Francisco context.

Person-Throughput or Person-Delay

Person-throughput or person-delay LOS measures integrate motor vehicle travel, transit service, bicycle, and pedestrian travel into a single indicator of mobility. Person-trips replace vehicle-trips as the basis for the capacity of a transportation facility. A person-throughput or delay measurement would use data on the average occupancy of vehicles and the average ridership on buses, data readily available to DPT and Planning.

Both person-based and user-based LOS methodologies provide a way to document the beneficial impacts of transportation projects of all modes. Network-based methodologies would further address system effects for less well-developed networks, such as bicycle networks. They also enable specific standards for service to each mode to be set. The Planning Department should adopt customer-based LOS methodologies for each mode, and/or a person-throughput methodology to estimate the impacts of proposed projects on the LOS of each mode at a point on (or segment of) the transportation system. A sub-committee of the Authority's Technical Working Group (TWG) should identify specific multimodal methodologies to test, and submit the results for the Authority Board's consideration. To implement any new methodologies, the Planning Commission would adopt the new methodologies in revised Guidelines for Environmental Review.

Corridor Impact Analysis

Intersections are the units conventionally analyzed for transportation impacts. However, intersections do not function in isolation. A corridor-level impact analysis is the most appropriate way to analyze the transportation impacts of projects such as bicycle or transit lanes, which are not implemented at a specific site. A corridor level impact analysis captures adaptations of traffic flow to lane removal better than a conventional intersection analysis. While a corridor impact analysis would probably increase the time and expense burden of preparing an EIR for bicycle and transit projects, it should be employed in place of or in combination with the aforementioned mitigated negative declaration or pilot test approach.

To implement a corridor impact analysis methodology, the Board should direct a TWG subcommittee to recommend a corridor impact analysis methodology for a defined set of projects in the Guidelines for Environmental Review. Some corridor methodologies aggregate individual intersections; others estimate corridor travel-time rather than intersection delay. In San Francisco, corridors sometimes include subsuface transit lines such as MUNI Metro and BART. The chosen methodology should anticipate and model traffic flow adaptations, rather than predict the condition of isolated intersections.

C. LOS Policy

Before LOS tools are brought to bear in analysis, the City's definitions of significant transprotation impact should be clarified and revised to more consistently implement General Plan policy. LOS measures and standards should be revised to better support decisions about how to allocate constrained public rights of way among various autos, transit, bicyclists, and pedestrians, to reflect City policy while satisfying CEQA requirements. First described are solutions that address the screening portion of project evaluation under CEQA; these are followed by recommendations that address the evaluation portion of the CEQA process.

Categorical Exemptions

The California State CEQA Guidelines categorically exempt from CEQA the creation of bicycle lanes on existing rights of way. A local jurisdiction, however, retains the authority to determine that a categorically exempt project may have significant impacts that require an EIR or mitigated negative declaration. Recall that in San Francisco, all projects, including bicycle and transit projects, must undergo environmental review if they potentially reduce motor vehicle LOS to LOS E.

"...GIVEN THE CITY'S MULTIMODAL POLICIES, IMPACTS TO MOTOR VEHICLE LOS SHOULD NOT BE CONSIDERED SIGNIFICANT IMPACTS ON STREETS WHERE THE BOARD INTENDS TO IMPROVE LOS FOR TRANSIT, BICYCLES, OR PEDESTRIANS....."

The Planning Commission could categorically exempt transit, bike, and pedestrian projects, as classes of projects, from CEQA review, after having first asked the State to include the category in the state CEQA Guidelines. Categorically exempt classes of projects are adopted as administrative regulations by resolution of the Planning Commission after public hearing. The consequences of this step would largely be symbolic if the Board of Supervisors does not direct implementing agencies to revise the definitions and measures of transportation LOS, and the thresholds for significant impact on transportation LOS. Categorically exempting classes of projects without revising the impact standards and measures will neither help implement difficult projects, nor satisfy CEQA. In general, improving the tools used in review, and redefining signifcant transportation impacts, is preferred rather than establishing exemptions from current standards for certain classes of projects.

Pilot Tests for Reversible Projects

Project sponsors and the Planning Department should continue their use of pilot tests to review "reversible" projects that may impact auto LOS. Striping projects, or other "reversible" projects that may have unknown impacts on transportation LOS, should be implemented as trials before requiring an EIR. A number of desirable projects with potential, but uncertain, future impacts have been implemented as pilot trials in the past. Examples are and the Fell, Valencia, and Arguello Street bicycle lanes.

This approach is used if an initial study of the project by the project sponsor suggests potential future but uncertain impacts. A pilot test is used only for those projects for which significant impacts are potentially forseeable. A mitigated negative declaration for the project incorporates a mitigation that would apply only if the impacts materialized after a specified time period. Projects with possible, but unknown, impacts to transportation LOS are implemented with a condition to collect data for a specified "pilot" period (e.g., 6 months) after which the project's impacts are assessed. If no adequate options for mitigating the impact were feasible, then the project would be reversed. Actually occurring significant impacts must be recognized either in a mitigated negative declaration, or evaluated in an EIR and mitigated, or the project must be reversed. The assumption is that appropriate mitigation opportunities will be available in the future, or that impacts may not materialize at all.

The transportation data collected under this technique would also provide an empirical basis for future estimates of the future traffic impacts from bicycle, transit, and pedestrian projects. Such data would be useful to support model enhancements to the SF Model, the primary travel demand forecasting tool used in transportation impact and CEQA analyses.

Future plans and studies, such as the Bicycle Master Plan Update, should identify those projects that are good candidates for pilot implementation.

Priority Mode Network

San Francisco's standards for significant impact to transportation should reflect the city's exisitng multimodal policies. The city's transportation objectives are not uniform citywide, as evidenced by the city's long-standing desire to control auto trips and maintain high transit, walk and bicycle mode shares in the downtown area, and Transit First policy, for example. The most direct way to implement CEQA in support of the city's multimodal transportation and environmental policies is for LOS methodologies to recognize this and depart from the current practice of applying LOS standards uniformly across the transportation system. LOS standards can and should vary across the different parts of the network as a reflection of the different roles certain streets play in the transportation network. One way to do this is to reduce significance threshold for impacts to auto LOS on streets where the City wishes to prioritize transit, bicycles, and pedestrians. San Francisco's designiation of a "significant impact" to autos, transit, bicycle, or pedestrian, would not be uniform throughout the entire city, but instead reflect the role of the street in providing safe, efficient access to the various activities along it, within the context of the city's multimodal transprotation network.

To implement revised standards for significant impact that accomplish this, Planning Commission should adopt a Priority Mode Network in the Guidelines for Environmental Review. The Transportation Element of the City's General Plan already sets forth modal networks that should be the basis of a significance threshold network. The Transit Preferential Streets program, established by the Board of Supervisors in 1973, is intended to improve a designated system of streets to prioritize transit services. The update to the Bicycle Master Plan will revise and re-establish the network of bicycle preferential streets designated in the 1997 Bicycle Master Plan.

Using these networks, the Guidelines would clarify the transportation LOS screening criteria and impact standards for each mode on each type of street. Standards for significant impact to each mode would not be uniform throughout the city. Different types of streets would have different LOS impact significance standards for each mode, which reflect the mode(s) that are granted priority on that street. Impact standards for autos may be lower, or transit impact standards would be higher, for instance, for projects being proposed on TPS streets. If auto LOS standards were lower for projects on TPS streets, this would mean that the city would tolerate more auto congestion on TPS streets in exchange for the expectation that TPS treatments would result in benefits to transit. If the City supports the idea of using "priority mode networks" in the environmental review process, the revised thresholds can be used both in the screening of projects and in the evaluation of impacts .

To address the concern that tolerance of auto LOS F would hinder the city's ability to require mitigation measures from a project, the city could redefine auto LOS measures to include grades below F, (i.e., LOS "G," "H," based on the volume to capacity ratios on which existing grades are based). Projects with auto LOS impacts that extend to G or H could then be considered significant, and subject to mitigations, if impacts cannot be otherwise avoided. The Institute of Transportation Engineers and Alameda County are, for example, pursuing desingation of LOS grades below F.

CEQA statutes recognize that significance thresholds for transportation LOS impacts need not be uniform across all City streets. Other California cities, such as Roseville, San Jose, and Walnut Creek, have used this flexibility to designate lower significance standards for auto LOS in downtown areas where transit and infill development are the priority. The Priority Mode Network would simply refine this concept by varying impact significance standards in a more fine-grained manner over San Francisco streets.

It is critical to note that, under CEQA, significance standards must be designated as characteristics of streets (significance thresholds may vary from street to street, but for any given street, must remain consistent from project to project). It is also important to recognize that because LOS standards apply to a street and may not vary from project to project, development projects as well as transportation projects would be subject to the revised standards for all modes. As with the concept of priority networks, certain "zones" of the city -- such as infill opportunity zones or transit oriented development zones -- could also be identified for such consideration.

Even if measures and thresholds are not adjusted to take into account priority networks, a Priority Mode Network as described above could assist the development of statements of overriding consideration to approve a transportation project - and the project EIR - despite impacts to auto LOS. A project that significantly improves transit LOS on a Transit Priority street should generally override negative impacts to motor vehicle LOS on such streets. A Modal Priorirty Network would provide a clear policy framework in the CEQA context for deciding when a project's benefits to transit, bicycle, or pedestrian LOS warrant a statement of overriding considerations for impacts to motor vehicle LOS. Developing LOS significance standards tailored to the General Plan's designations of modal priority heirarchies would enhance the Planning Department's process for preparing findings of overriding considerations for projects with clear benefits that outweigh their significant impacts.

To implement this approach, an LOS Technical Working Group (TWG) should aim to designate priority networks and thresholds for screening and evaluation purposes, beginning with the General Plan networks such as the TPS network, and subsequently with the bicycle network. The TWG would report recommendations to the Authority Board. To actually implement these recommendations in environmental review, the Planning Commission would revise the Guidelines for Environmental Review. The Planning Commission could then also adopt this network, after a public hearing process as part of the General Plan Transportation Element.

Master EIR for Plans

A single master environmental impact report (MEIR) may be prepared for a plan, element of a plan, or a project that consists of smaller individual projects that will be implemented in phases. The intent is to expedite individual project implementation, increase the certainty that projects contained in a plan will be delivered, and resolve to a greater degree the inevitable rights-of-way tradeoffs - up-front during the planning process.

A MEIR should identify subsets of projects - e.g., those exempt from further review, or those eligible for pilot or other streamlined review processes. Proposed Plan projects that would raise the LOS of transit, bicycles, or pedestrians to new City standards, yet negatively impact motor vehicle LOS, could subsequently be approved with a mitigated negative declaration that includes programmatic mitigation measures identified in a Master EIR.[5]

A mitigated negative declaration is adopted pursuant to CEQA when a project's potential significant impacts can be reduced to a level of insignificance through project revisions or mitigation measures.[6] These programmatic measures would be adopted within a MEIR.

Programmatic mitigations in mitigated negative declarations have previously been adopted as comprehensive mitigation programs associated with a Master EIR for a plan of projects (e.g., the Downtown Plan EIR). This approach could potentially benefit the projects in bicycle or pedestrian plans. A mitigation package that incorporates programmatic measures in the context of a Master Plan EIR could balance impacts to motor vehicle LOS with the environmental benefits expected from improvements to transit, bicycle, and pedestrian LOS.

To successfully streamline indivdiual projects through a MEIR, projects in a Master Plan must be specifically described such that needed mitigation measures can be adopted in the MEIR. This require more up-front time and funding, such as from the transportation sales tax.

"... TO SUCCESSFULLY STREAMLINE INDIVIDUAL PROJECTS TRHOUGH A MASTER EIR (MEIR), PROJECTS... MUST BE SPECIFICALLY DESCRIBED SUCH THAT NEEDED MITIGATION MEASURES CAN BE ADOPTED IN THE MEIR. THIS REQURIES MORE UPFRONT TIME AND FUNDING."

This approach should be implemented with the Bicycle Master Plan, now being updated, as well as for corridor improvement plans and transportation projects in future neighborhood area plans, as relevant. A TWG subcommittee should explore possible programmatic mitigations appropriate for mitigating the motor vehicle LOS impacts of transit, bicycle, and pedestrian projects, and that identify the circumstances under which programmatic mitigations effectively mitigate these impacts. This guidance could be adopted by the Planning Commission and then incorporated into the Planning Department's Guidelines for Environmental Review.

V. RECOMMENDATIONS AND NEXT STEPS

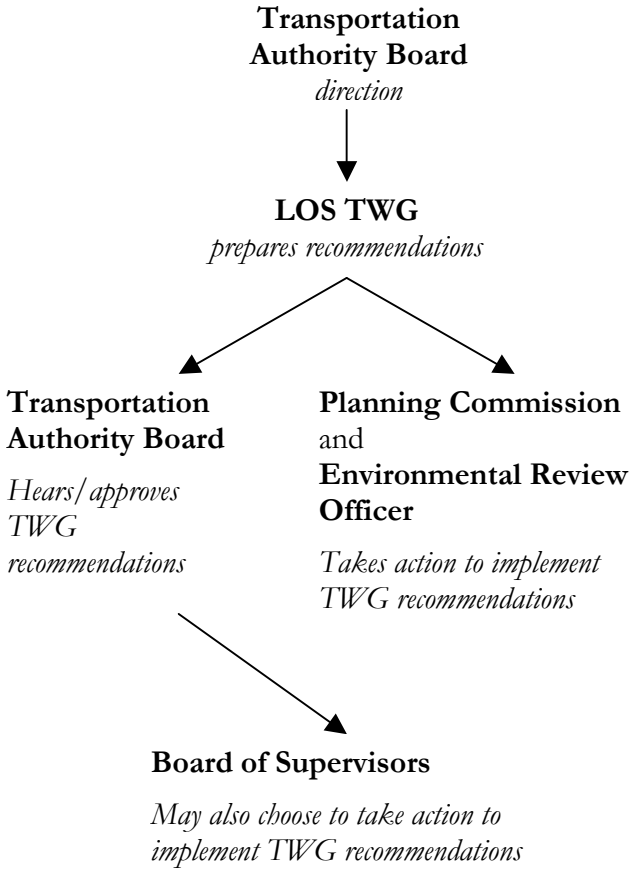
The SAR identifies a number of recommendations for establishing a more comprehensive set of multimodal LOS measures, and suggestions for how to apply these measures in the screening and evaluation stages of transportation impact analysis. Any of these recommendations may require the Board of Supervisors or Planning Commission to state supporting evidence in the record, which this SAR begins to provide, by documenting the rationale and advances in the state-of-the practice nationally and here in San Francisco.

Most of the following recommendations could be implemented in the next six months, with the benefit of applying the revised methods and procedures to a number of upcoming projects. Other recommendations, in particular customer-based or person LOS measures, may require a twelve-month time frame.

5 This is an alternative to approving a project with a statement of overriding considerations.
6 CA Public Resources Code, Section 21080 (c)

§ **LOS TWG subcommittee.** The following recommendations require interdepartmental staff collaboration on a technical level. If the Authority Board wishes to recommend revisions to current City LOS policy and practice, the Authority Board should convene a technical working group (TWG) including representation from the Planning Department Office of Major Environmental Assessment, MUNI, DPT, industry practitioners, and representatives of user groups as appointed by the Executive Director. Opportunities should be ensured for public review of the LOS TWG's work. For example, the Authority Board could invite members of existing Citizens Advisory Committees and modal advisory committees -- such as the Bicycle Advisory Committee and Pedestrian Safety Advisory Committee -- to review and comment on the TWG's work. In recognition of the range of difficulty that is associated with developing the recommendations to follow, the LOS TWG could refine the SAR's recommendations and report back to the Authority Board in two phases, at six and twelve months.

§ **Priority Mode Network.** The first task of the LOS TWG subcommittee should be to designate a Priority Mode Network as described above, based on existing General Plan Networks such as the TPS network. To actually implement this Network as part of the Guidelines for Environmental Review, it would need to be adopted by the Planning Commission. LOS improvements to transit and bicycles on designated transit-priority and bicycle network streets should take priority over preserving motor vehicle LOS. The Priority Mode Network would clarify the policies for determining when improvements to bicycle and transit LOS "override" negative impacts to motor vehicle LOS.



§ **Customer-Based Multimodal or Person-LOS Methodologies.** The Authority Board should direct the LOS TWG subcommittee to explore and recommend LOS methodologies and standards for each mode. In order to implement updated LOS definitions and measures, the Planning Commission must include them in the Guidelines for Environmental Review. After analysis, customer-centric or person-LOS methodologies should be recommended in the Guidelines to estimate the relative improvements in LOS for all modes, in addition to negative impacts on LOS, from proposed projects.

§ **Corridor Impact Analysis.** The Authority Board should direct the LOS TWG subcommittee to determine an appropriate corridor-level LOS impact analysis methodology, and identify a set of projects for which corridor level analysis is appropriate. To be implemented, this guidance must be adopted by the Planning Commission in the Guidelines for Environmental Review..

§ **Pilot Test Projects.** Project sponsors and Planning Department should continue to implement reversible projects with unknown impacts as pilot tests before requiring the project to complete environmental review. The LOS TWG subcommittee should ensure the collection of data from environmental review pilot projects, as described above, on the response of traffic patterns to different rights of way changes.

§ **Test Cases: Transit Corridor Studies; Bicycle Master Plan Update.** The Authority Board should direct the TWG subcommittee to develop recommendations within a six month timeframe. This would enable any new tools or methods to be implemented on several important test cases: upcoming transit corridor studies, and the Bicycle Master Plan update. By using the corridor studies and Bicycle Plan Update as an opportunity to implement any recommendations, the Authority Board will have the ability to monitor the effectiveness of any new tools or procedures in a timely manner.

§ **Master EIR for Plans.** Project sponsors, such as DPT or the Planning Department, should prepare Master EIRs for citywide transportation plans, such as the Bicycle Master Plan update, pedestrian master plan, and neighborhood area plans, where appropriate. MEIRs would identify categories of projects that should be exempt from further environmental review, or are eligible for streamlined review or pilot tests, and anticipate projects that may encounter difficulty in environmental review. The Authority Board should fund MEIRs and monitor the effectiveness of Master EIRs for improving the deliverability of trans-

portation plans. The LOS TWG could develop a "model" mitigated negative declaration to illustrate and clarify for project sponsors the conditions under which projects may be eligible for mitigated negative declarations, and the type of mitigations that may be relevant. For instance, the Guidelines for Environmental Review currently includes a list of typical transportation mitigations for the downtown area.

§ **SF Model Enhancements.** These revisions are consistent with other intermediate term strategies to make more consistent the City's process for considering transportation impacts, such as the use of the San Francisco Transportation Model to provide a consistent basis for estimating cumulative impacts. The model has also been set up as a tool to accomplish better project evaluation. Using data collected through pilot and corridor studies, the Authority should develop better capability to model demand for transit, bicycle and transit travel, including importance of and sensitivities to different LOS attributes.

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VI. AUTHORITY STAFF CREDITS

The Authority is indebted to the staff members for their contribution to making this SAR possible. The principal analyst who prepared the SAR was Rachel Hiatt, Planner. Tilly Chang, Manager of Planning, provided overall direction for the projrct and guidance in the preparation of the report. The report also benefitted from direction and review by Fred Ridel and Maria Lombardo, Deputy Director.

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Appendix A

Transportation Impact Screening Criteria (SF Planning Department)
Source: 2002 Guidelines

The Planning Department will make a determination whether a transportation study and report are necessary. In most cases, the department evaluates conditions in the PM peak hour of the PM peak period (4:00 to 6:00PM). This period was chosen because it is the time period when the maximum use of much the transportation system occurs. It is also the time when most of the transportation system capacity and service is at a maximum. Generally, a transportation report may be required for an environmental analysis if one or more of the following conditions apply. Not all conditions apply to all projects.

1) The project would potentially add at least 50 PM Peak Hour person trips;

2) The project would potentially increase existing traffic volumes on streets in its vicinity by at least 5 percent;

3) The project would potentially impact nearby intersections and/or arterials which are believed to presently operate at LOS "D" or worse;

4) The project would provide parking which would appear likely to be deficient relative to both the anticipated project demand and code requirements by at least 20 percent;

5) The project has elements which have potential to adversely impact transit operations or the carrying capacity of nearby transit services;

6) The project has elements which have potential to adversely affect pedestrian or bicycle safety or the adequacy of nearby pedestrian or bicycle facilities;

7) The project would not fully satisfy truck loading demand on-site, when the anticipated number of deliveries and service calls may exceed ten daily.

Transportation reports shall be prepared by qualified consultants, working at the direction of the Planning Department staff. The purpose of the transportation study is to provide the comprehensive information necessary to identify the transportation issues and impacts of a project (including those of importance and significance), and provide potential solutions or mitigations to problems and significant impacts in the context of the overall policies and objectives of the City.

Appendix B

Transportation Impact Significance Criteria (SF Planning Department)
Source: SF Planning Department

TRANSPORTATION IMPACT SIGNIFICANCE CRITERIA

The following are the significance criteria regarding transportation used by the Planning Department for the determination of impacts associated with a proposed project:

- The operational impact on signalized intersections is considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F. The project may result in significant adverse impacts at intersections that operate at LOS E or F under existing conditions depending upon the magnitude of the project's contribution to the worsening of the average delay per vehicle. In addition, the project would have a significant adverse impact if it would cause major traffic hazards or contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels.

- San Francisco does not consider parking supply as part of the permanent physical environment. Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

- Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact. (CEQA Guidelines § 15131(a).) The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's "Transit First" policy. The City's Transit First Policy, established in the City's Charter Section 16.102 provides that "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation." DISCUSS ANY AVAILABLE ALTERNATIVE TRANSPORTATION, PARKING FACILITIES, BIKE LANES, ETC HERE (can be a summary if discussed extensively elsewhere)]

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if convenient parking is unavailable. Moreover, the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts which may result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects.

- The project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result. With the MUNI and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the PM peak hour.

- The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

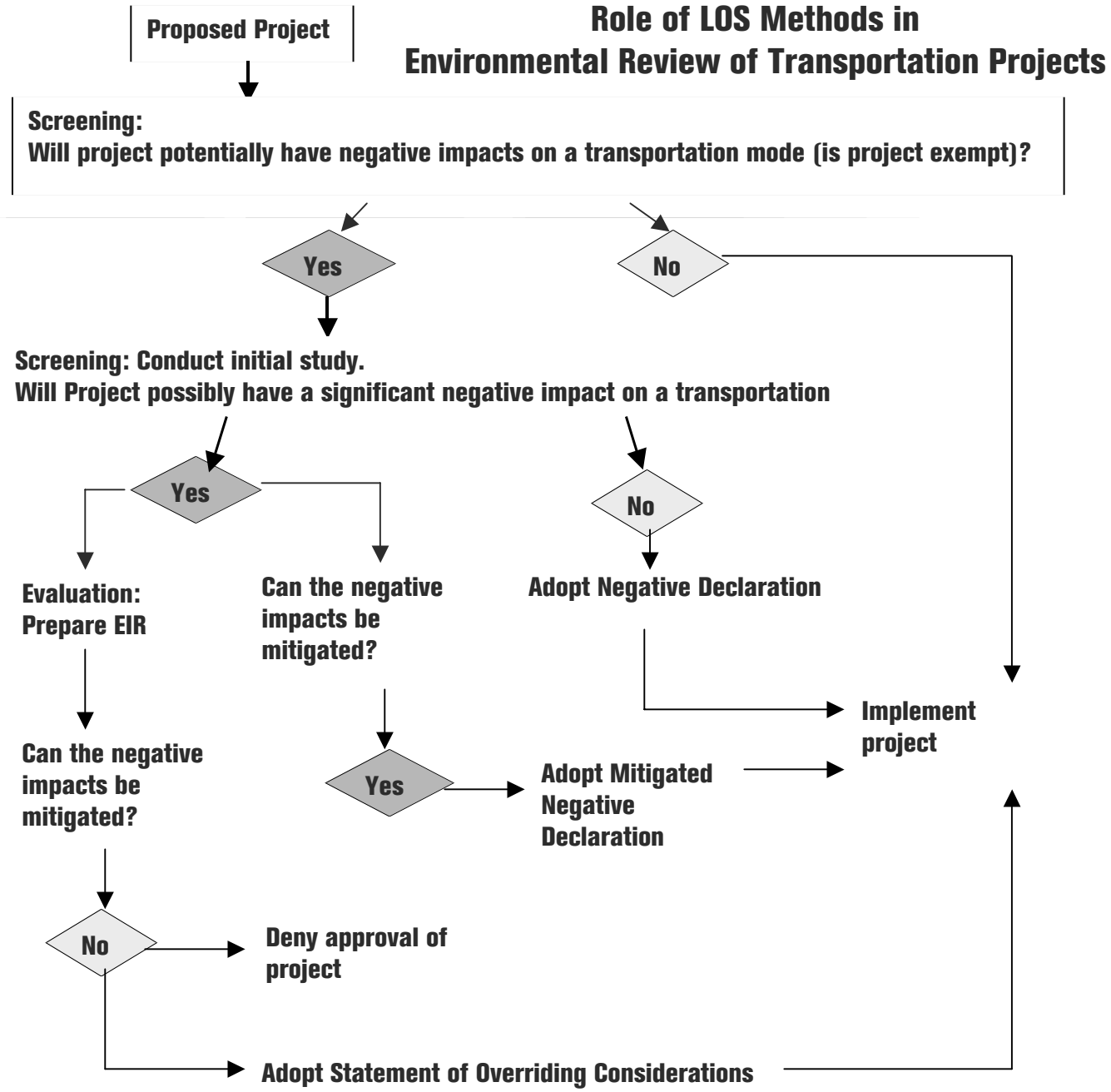
- The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

- Loading impacts were assessed by comparing the proposed loading space supply to the Planning Code requirements and the estimated loading demand during the peak hour of loading activities.

- Construction-related impacts generally would not be considered significant due to their temporary and limited duration.

Appendix C

Transportation Impact Analysis Process: the Role of LOS
Source: adapted from California Resources Agency



Appendix D

Multimodal Level of Service (LOS) Methodologies: Selected Alternate Methodologies
Sources: Transportation Research Board; Florida Department of Transportation; Federal Highway Administration

LOS Measure	Mode	LOS Definition	A "grade A" score means:
Highway Capacity Manual 2000	Transit	• Service Frequency • Service Span • Pedestrian, Bicycle, and ADA access to transit route • Passenger Load • Transit Stop amenities • Route segment reliability • Route segment travel speed	• Service frequency >6 vehicles/hour • Service span 18-24 hours/day • Easily accessible to pedestrians, bicyclists, and the disabled • No passenger need sit next to another • Shelter, seating, landing pad, information signs, and garbage receptacle provided • No more than 1 late bus per month • Parity with auto speeds
Bicycle Compatibility Index	Bicycles	• Presence and width of lane or shoulder • Curb lane width • Curb lane auto volume • Auto volume in other lanes • Speed of auto traffic • Presence and occupancy of curbside parking • Type of roadside development • Adjustments for truck volumes, parking turnover, right-turn volumes	• Lane or paved shoulder > .9 m • Depends on context • Low auto volumes • Low auto speeds • No curbside parking • Residential development • < 10 trucks/hour • > 480 minute parking time limit • hourly right turn volume < 270 vehicles
Florida Department of Transportation Quality / Level of Service Handbook	Transit	• Frequency • Span of Service • Pedestrian Access to Transit	• > 6 transit vehicles / hour • 19 – 24 hours of service/day • see Pedestrian LOS, below
	Bicycle	• Width of outside through lane • Auto volumes and speed • Truck volumes • Pavement condition	• 10 feet • Low auto volumes and speeds • Low truck volumes • Based on FHWA's rating system
	Pedestrian	• Existence of sidewalk • Lateral separation of peds from autos • Auto volumes and speeds • At intersections, number of lanes to cross • Presence of median	• Sidewalk present • Larger separation of peds from autos • Lower auto volumes and speeds • 2 lanes • where more lanes, a median