

# Memorandum

To: CHAIR AND COMMISSIONERS

CTC Meeting: August 17-18, 2005

Reference No.: 4.4  
Action Item

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Ref: **DRAFT AMENDMENT TO SYSTEM PERFORMANCE MEASURES**

## **RECOMMENDATION**

The Department of Transportation (Department) recommends the California Transportation Commission (Commission) adopt the attached amendments to Section 19 of the STIP Guidelines and the Specific Guidance for the 2006 State Transportation Improvement Program (STIP) Cycle (as it relates to Section 19).

## **BACKGROUND**

At the May 2005 Commission meeting, the Department presented to the Commission the system performance measures that were developed by a transportation stakeholders team and the state-of-the-system prototype report that was recently completed by the Department. At the conclusion of the presentation, the Commission directed staff to identify a set of system performance measures to be used in the 2006 STIP cycle.

Section 19 (Criteria for Measuring Performance and Cost-Effectiveness) of the STIP Guidelines has been amended to include the set of performance measures for use in evaluating the performance of submitted Regional Transportation Improvement Programs (RTIPs) and the Interregional Transportation Improvement Program (ITIP). These measures are included as Table A and provide a way to quantitatively evaluate the criteria already specified in Section 19.

Other changes to Section 19 include identifying the types of projects where a project level evaluation is preferable. Project level evaluations should be considered for project proposals that include the construction of a large new facility or a substantial expansion of an existing facility and where over 50% of a county's target for new programming, as identified in the fund estimate, is applied or is over \$50 million in total project costs.

A report format for the evaluations, as specified in Section 19, is included in the Specific Guidance for the 2006 STIP. It is recognized that the regions are at various stages of development and use of performance measures in their Regional Transportation Plan (RTP) process. With that in mind, the report format provides the flexibility to the regions to evaluate their RTIP submittals using the measures as identified in Table A in Section 19 of the guidelines or to use measures consistent with the goals and objectives identified in their respective RTPs.

The proposed amendments to Section 19 and the Specific Guidance for the 2006 STIP Cycle was presented to the Commission as an information item at its July 14, 2005 meeting. There were significant concerns raised by the regional and rural agencies. The Department has worked with these agencies and made revisions to address these concerns.

Attachments

**PROPOSED CHANGES TO SECTION 19 OF THE  
COMMISSION'S ADOPTED STIP GUIDELINES**

19. Criteria for Measuring Performance and Cost-Effectiveness. In order to maximize the state's investments in transportation infrastructure, it is the Commission's policy that each RTIP and the ITIP will be evaluated, as they are developed, for performance and cost-effectiveness at the system ~~or~~ and project level ~~as where~~ appropriate. For ~~large projects for which major investment studies are undertaken,~~ new projects **for which construction of a large new facility or a substantial expansion of an existing facility is proposed and over 50% of a county's target for new programming as identified in the fund estimate is applied or is over \$50 million in total project costs,** a project level evaluation is preferable. The evaluation should be ~~done~~ **conducted** by each region and by Caltrans before the RTIPs and the ITIP are submitted to the Commission for incorporation into the STIP. ~~Beginning with the 2002 STIP cycle,~~ Each RTIP and the ITIP submitted to the Commission will be accompanied by a report on its performance and cost-effectiveness. ~~Ideally, as performance measurement concepts and techniques mature,~~ Regional agencies and Caltrans will, as part of the transportation planning and programming process, monitor transportation systems and projects for performance and ~~refine~~ **provide** performance forecasts for use in evaluation of ~~future~~ RTIPs and ITIPs. ~~As performance measurement concepts and techniques continue to mature,~~ updated guidance may be **provided in future STIP guidelines.**

The Commission will consider the evaluations submitted by regions when making decisions on RTIPs as described in Section 60 of these guidelines. The Commission will consider evaluation submitted by Caltrans when making decisions on the ITIP as described in Section 62 of these guidelines.

The evaluation report should clearly demonstrate how effective the RTIP or the ITIP is in addressing or achieving the goals, objectives and standards which are established as part of the respective regional transportation plan (RTP) or Caltrans' Interregional Transportation Strategic Plan (ITSP). The purpose of the evaluation report is to assess the performance and cost effectiveness of each RTIP and the ITIP based on its own merits, not to attempt a comparative assessment between individual RTIPs or RTIPs and the ITIP. RTIP evaluations should also address how the RTIP relates to the ITSP at key points of interregional system connectivity. Caltrans' evaluation of the ITIP should address ITIP consistency with the RTPs. Each region is responsible for establishing ~~the~~ transportation goals, ~~and the objectives and standards to be used in its evaluation of RTIP performance.~~ **of its RTP that are reflected in its RTIP.** However, ~~the Commission urges~~ each region ~~should to~~ consider ~~including~~ improvements to mobility, accessibility, reliability, **safety, and productivity (throughput)** ~~and sustainability and safety~~ as part of the fundamental **performance** goals of ~~any~~ its long-range transportation plan **and its RTIP submittal.**

Regions and Caltrans are responsible for ~~determining the techniques and methodology to be used in evaluating the performance and cost-effectiveness of RTIPs and the ITIP~~ developing goals, objectives and priorities that include consideration of system performance. The Commission recognizes that many measures of performance and benefit are difficult to evaluate and may be more subjective rather than measurable in quantifiable units. In order to facilitate statewide consistency, regions and Caltrans, should also consider using (when appropriate) values of performance and benefits and evaluation methodologies which are commonly accepted and which represent accepted or standard practice. The Commission encourages regions to consider using (when appropriate) values of time, safety, vehicle operation costs and discount rates which are developed by Caltrans for benefit cost analysis of transportation projects.

The Commission does expect that evaluations of performance and cost-effectiveness will be for a 20-year period or on a life cycle basis. Reports to the Commission on evaluations of performance and cost effectiveness should be presented in a format which is disaggregated to the level of the benefits and measures used.

In establishing the following criteria the Commission recognizes that it ~~is may be~~ difficult to develop and utilize criteria that ~~is are~~ relevant in both urban and non-urban regions **or relevant at both a statewide and regional level**. Different criteria may apply depending on the complexity of a region ~~and its RTP/RTIP or the functionality of an interregional route~~. To this end, ~~the each~~ regions ~~should select and utilize criteria most applicable to its own jurisdiction~~ and Caltrans should use the criteria provided below, and are encouraged to highlight other criteria that are essential for the purposes of program development and project selection. Where applicable, the performance measures listed in Table A should be used to quantitatively evaluate the criteria below. Results of analysis will not only be used to forecast the impact on the transportation system of projects contained in the RTIPs and the ITIP, but also indicate current system performance, thereby establishing a baseline from which future performance trends may be observed.

Regions and Caltrans should ~~use consider~~ the following criteria for measuring the performance of RTIPs and the ITIP:

1. Change in vehicle occupant, freight and goods travel time or delay.
2. Change in accidents and fatalities.
3. Change in vehicle and system operating costs.
4. Change in access to jobs, markets and commerce.
5. Change in frequency and reliability of rail/transit service.
6. Change in air pollution emissions.
7. Change in passenger, freight and goods miles carried.

Regions and Caltrans should consider the following criteria for measuring cost-effectiveness of RTIPs and the ITIP:

1. Decrease in vehicle occupant travel, freight and goods time per thousand dollar invested.
2. Decrease in accidents and fatalities per thousand dollar invested.
3. Decrease in vehicle and system operating cost per thousand dollar invested.
4. Improved access to jobs, markets and commerce per thousand dollar invested.
5. Increased frequency reliability of rail/transit service per thousand dollar invested.
6. Decrease in air pollution emissions per thousand dollar invested.
7. Increase in annual passenger, freight and goods miles carried per thousand dollar invested.

**TABLE A: Performance Indicators, Measures and Definitions**

Indicator	Relation to Section 19 Performance Criteria	Performance Measures			Definition/Indication
		Mode	Level*	Measures	
<b>Safety</b>	2	Roadway	Region	Fatalities / Vehicle Miles Traveled (VMT)	Indicates the ratio of the number of fatalities to the number of vehicle miles traveled.
	2			Fatal Collisions / VMT	Indicates the ratio of the number of fatal collisions to the number of vehicle miles traveled.
	2			Injury Collisions / VMT	Indicates the ratio of the number of injury collisions to the number of vehicle miles traveled.
	2	Transit	Mode	Fatalities / Passenger Miles	Indicates the ratio of the number of fatalities to the number of passenger miles traveled.
<b>Mobility</b>	1	Roadway	Region	Passenger Hours of Delay / Year	Indicates the total amount of delay per traveler that exists on a designated area over a selected amount of time.
	1			Average Peak Period Travel Time	Indicates the average travel time for peak period trips taken on regionally significant corridors and between regionally significant origin and destination pairs.
	1			Average Non-Peak Period Travel Time	Indicates the average travel time for non-peak period trips taken on regionally significant corridors and between regionally significant origin and destination pairs.
<b>Accessibility</b>	4 (also 1,3,6,7)	Transit	Region	Percentage of population within 1/4 mile of a rail station or bus route.	Indicates the accessibility of transit service.
<b>Reliability</b>	1	Roadway	Corridor	Travel Time Variability	Indicates the difference between expected travel time and actual travel time.
	5	Transit	Mode	Percentage of vehicles that arrive at their scheduled destination no more than 5 minutes late.	These measures indicate the ability of transit service operators to meet customers' reliability expectations.

\*Level:

Corridor - Routes or route segments that are identified by regions and Caltrans as being significant to the transportation system.

Region - Region or county commission that is responsible for RTIP submittal.

Mode - One of the following transit types (light rail, heavy rail, commuter rail, trolley bus, and all forms of bus transit).

**TABLE A: Performance Indicators, Measures and Definitions**

Indicator	Relation to Section 19 Performance Criteria	Performance Measures			Definition/Indication
		Mode	Level*	Measures	
<b>Productivity (Throughput)</b>	7	Roadway - Vehicles	Corridor	Average Peak Period Vehicle Trips	Indicates the utilization of the transportation system by all vehicles.
	7			Average Daily Vehicle Trips	
	7	Roadway - People	Corridor	Average Peak Period Vehicle Trips Multiplied by the Occupancy Rate	Indicates the utilization of the transportation system by people.
	7			Average Daily Vehicle Trips Multiplied by the Occupancy Rate	
	7	Trucks	Corridor	Percentage of Average Daily Vehicle Trips that are (5+ axle) Trucks	Indicates the utilization of the transportation system by trucks.
	7			Average Daily Vehicle Trips that are (5+ axle) Trucks	
	7	Transit	Mode	Passengers per Vehicle Revenue Hour	Indicates the effectiveness of mass transportation system operations by measuring the number of passengers carried for every mile of revenue service provided.
	7			Passengers per Vehicle Revenue Mile	
	7			Passenger Mile per Train Mile (Intercity Rail)	
<b>System Preservation</b>	3	Roadway	Region	Total number of Distressed Lane Miles	Indicates the number of lane miles in poor structural condition or with bad ride (pavement condition).
				Percentage of Distressed Lane Miles	
				Percentage of Roadway at Given IRI Levels	Indicates roadway smoothness.
<b>Return on Investment/ Lifecycle Cost</b>	1-7				Return on Investment indicates the ratio of resources available to assets utilized. Lifecycle Cost Analysis is Benefit-Cost Analysis that incorporates the time value of money.

\*Level:

Corridor - Routes or route segments that are identified by regions and Caltrans as being significant to the transportation system.

Region - Region or county commission that is responsible for RTIP submittal.

Mode - One of the following transit types (light rail, heavy rail, commuter rail, trolley bus, and all forms of bus transit).

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## **Specific Guidance for the 2006 STIP Cycle**

The inclusion of specific performance measures in the 2006 STIP cycle is to provide regional agencies and Caltrans the opportunity to demonstrate how the goals and objectives contained in each Regional Transportation Plan (RTP) or the Interregional Transportation Strategic Plan (ITSP) are linked to the program of projects contained in each RTIP and the ITIP. With this in mind, each agency and Caltrans is being asked to provide a quantitative and/or qualitative evaluation of their respective Tier A RTIPs and the ITIP, commenting on each of the performance indicators and performance measures outlined in Table A. Attachment 1 has been developed to assist agencies with this task. Attachment 1 will be considered the evaluation for the 2006 STIP cycle and will fulfill the requirement outlined in Section 19 of the STIP Guidelines.

The overarching goal for using performance measures in the 2006 STIP cycle is to begin a systematic and reliable process that all agencies can use to guide transportation investment decisions and to demonstrate the benefits of proposed transportation system investments. The information gathered in this STIP cycle will not only provide information on how performance measures are currently applied and reported across the state, but will also provide insight into improving performance measures, data collection and performance reporting procedures and integrating the results to enhance decision making. The information collected in Attachment 1 may also guide future revisions to the STIP, Regional Transportation Plan (RTP) and Project Study Report (PSR) guidelines with the objective of strengthening the continuity and consistency from goal and objective setting to project selection and performance reporting.

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## Attachment 1

**Part A:**

Complete Part A.

Use the following to indicate quantitatively how your Regional Transportation Improvement Program (RTIP) or the Interregional Transportation Improvement Program (ITIP) is consistent with the goals established in your Regional Transportation Plan (RTP) or the Interregional Transportation Strategic Plan (ITSP). If any of the performance measures in Part A do not reflect the goals contained in an RTP/ITSP or if an RTIP/ITIP does not contain goals that are measurable by the performance measures contained within, simply state “not applicable (na)” for each indicator or each performance measure (where appropriate).

Performance Indicators and Measures						
Indicator	Relation to STIP Section 19 Performance Criteria	Performance Measures			Current System Performance (Baseline)	Projected Impact of Projects
		Mode	Level*	Measures		
Safety	2	Roadway	Region	Fatalities /Vehicle Miles Traveled (VMT)		
	2			Fatal Collisions / VMT		
	2			Injury Collisions / VMT		
	2	Transit	Mode	Fatalities / Passenger Miles		
Mobility	1	Roadway	Region	Passenger Hours of Delay / Year		
	1			Average Peak Period Travel Time		
	1			Average Non-Peak Period Travel Time		
Accessibility	4 (also 1,3,6,7)	Transit	Region	Percentage of population within 1/4 mile of a rail station or bus route.		
Reliability	1	Roadway	Corridor	Travel Time Variability		
	5	Transit	Mode	Percentage of vehicles that arrive at their scheduled destination no more than 5 minutes late.		
Productivity (Throughput)	7	Roadway - Vehicles	Corridor	Average Peak Period Vehicle Trips		
	7			Average Daily Vehicle Trips		
	7	Roadway - People	Corridor	Average Peak Period Vehicle Trips Multiplied by the Occupancy Rate		
	7			Average Daily Vehicle Trips Multiplied by the Occupancy Rate		
	7	Trucks	Corridor	Percentage of Average Daily Vehicle Trips that are (5+ axle) Trucks		
	7			Average Daily Vehicle Trips that are (5+ axle) Trucks		
	7	Transit	Mode	Passengers per Vehicle Revenue Hour		
	7			Passengers per Vehicle Revenue Mile		
	7			Passenger Mile per Train Mile (Intercity Rail)		
System Preservation	3	Roadway	Region	Total number of Distressed Lane Miles		
	3			Percentage of Distressed Lane Miles		
	3			Percentage of Roadway at Given IRI Levels		
Return on Investment/ Lifecycle Cost	1-7					

\*Level:

Corridor - Routes or route segments that are identified by regions and Caltrans as being significant to the transportation system.

Region - Region or county commission that is responsible for RTIP submittal.

Mode - One of the following transit types (light rail, heavy rail, commuter rail, trolley bus, and all forms of bus transit).

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## Part B:

If Part A alone is insufficient in indicating how progress towards attaining goals and objectives contained in each RTP and the ITSP is assessed and measured, complete Part B.

Include the following information:

- List your performance measures.
- Provide a quantitative and/or qualitative analysis (include baseline measurement and projected program or project impact).
- State the reason(s) why selected performance measure or measures are accurate and useful in measuring performance. Please be specific.
- Identify any and all deficiencies encountered in as much detail as possible.

Provide a quantitative evaluation and/or qualitative explanation of how the goals and objectives contained in the Regional Transportation Plan (RTP) or the Interregional Transportation Strategic Plan (ITSP) are linked to the program of projects contained in the RTIP and the ITIP.

For qualitative explanations, state how progress towards attaining goals and objectives contained in each RTP and the ITSP is assessed and measured. If performance indicators and/or performance measures used by an agency are different from those outlined in Table A of the Guidelines and as provided in Attachment 1, describe the method(s) used.

If the quality or quantity of data required to quantitatively demonstrate the linkage between an RTIP/ITIP and the associated RTP/ITSP is in question, describe the quality and quantity of data that is available, being sure to highlight those instances where data is not available. Where data is unavailable, please describe data deficiencies in as much detail as possible.

## Part C:

*For new projects for which construction of a large new facility or a substantial expansion of an existing facility is proposed and over 50% of a county's target for new programming as identified in the fund estimate is applied or is over \$50 million in total project costs, a project level evaluation is preferable.*

If a project-level evaluation is conducted, Table A should be used for reference.