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## **3.0 Phase II Evaluation Performance Measures and Overview**

## 3.0 Phase II Evaluation

# Performance Measures and Overview

The goals and objectives presented in the previous section provide the framework for the Phase II evaluation. This section presents the particular measures of effectiveness evaluated during the study. These evaluation measures build on the evaluation objectives and are designed to provide for a comprehensive analysis of the evaluation goals. This section also presents an overview of the methodologies employed to collect and analyze data for the study.

### ■ 3.1 Evaluation Measures

For each of the evaluation objectives identified in Section 2.0, one or more measures of effectiveness have been identified to provide an assessment of the objective. Where possible, these evaluation measures are expressed in quantitative terms; however, many of the measures are more appropriately expressed in qualitative terms. The evaluation measures selected for each evaluation objective are presented in Table 3.1.

The measures of effectiveness are not mutually exclusive and, in some cases, the same measure is used to test several objectives. The evaluation measures are also designed to be “neutral” and not pre-suppose any outcome of the ramp meter test. In all cases, the outcome of the particular measure may be either positive or negative, depending on the impacts observed during the two scenarios. Outcomes may also be *both* positive and negative in that results may vary geographically across the selected corridors, market segments, or timeframes.

Section 3.2 presents an overview of the methodology employed in evaluating these measures. The remaining sections of this document provide greater detail on the data collection and analysis methodologies.

**Table 3.1 Phase II Evaluation Measures**

Evaluation Objective	Measures of Effectiveness
1. Quantify ramp traffic flow impacts/benefits (positive and negative) of new metering strategy at selected corridors	<ul style="list-style-type: none"> <li>• Changes in traffic volume for on-ramps at selected corridors</li> <li>• Queue lengths at the ramps</li> <li>• Changes in customer attitudes/satisfaction levels toward the new metering strategy at selected corridors</li> <li>• Perceived ramp delay and ramp travel time reliability changes at selected corridors</li> </ul>
2. Quantify freeway mainline traffic flow impacts/benefits (positive and negative) of new metering strategy at selected corridors	<ul style="list-style-type: none"> <li>• Changes in traffic volume, travel time, travel speed, and travel time reliability for freeways at selected corridors</li> <li>• Changes in customer attitudes/satisfaction levels toward freeway operations at selected corridors</li> <li>• Perceived changes in travel time and travel time reliability at selected corridors</li> </ul>
3. Quantify safety impacts/benefits (positive and negative) of new metering strategy at selected corridors	<ul style="list-style-type: none"> <li>• Changes in the number and severity of crashes occurring at selected corridors</li> <li>• Perceived changes in safety of travel in selected corridors</li> </ul>
4. Quantify impacts/benefits (positive and negative) of freeway-to-freeway ramp metering at one location.	<ul style="list-style-type: none"> <li>• Changes in traffic volume, travel time, travel speed, and travel time reliability for the freeway</li> <li>• Changes in traffic volume, travel time, travel speed, and travel time reliability for the on-ramp</li> <li>• Changes in customer attitudes/satisfaction levels toward freeway-to-freeway metering</li> <li>• Perceived ramp delay and ramp travel time reliability changes at selected corridors</li> <li>• Perceived changes in safety of travel in selected corridors</li> </ul>
5. Identify impacts of ramp metering on local streets	<ul style="list-style-type: none"> <li>• Change in travel time for alternative travel route in a selected corridor</li> <li>• Change in travel speed for alternative travel route in a selected corridor</li> <li>• Change in traffic volume for alternative route in a selected corridor</li> </ul>
6. Document additional ramp metering benefits/impacts observed during the study	<ul style="list-style-type: none"> <li>• Documentation only</li> </ul>

## ■ 3.2 Overview of Evaluation Methodologies

Data related to the evaluation measures of effectiveness were collected in the Fall of 2001, between September 10 and September 28, 2001. In this scenario, the ramp meters were operating at a reduced metering capacity from the strategy evaluated in the fall of 2000. To identify impacts of ramp metering away from the affected ramps and freeway sections, an evaluation study was conducted on one selected parallel arterial. Also, to analyze the impacts of freeway-to-freeway metering, an evaluation study was conducted at one of the freeway-to-freeway ramps. Furthermore, traveler surveys were conducted to provide additional information to help in the identification and development of appropriate modifications to the metering strategy.

To support the evaluation, individual test plans were developed to guide the collection and analysis of different types of data. Each test plan provided detailed instructions for conducting a specific aspect of the study. Yet, all the individual test plans were carefully linked to provide coordination between the different analysis efforts. The individual test plans developed for this study include:

- **Field data collection plan for selected freeways and one alternative arterial** – The plan identifies selected corridors, and the field data collected and analyzed (Section 4.0); and
- **Market research test plan** – The plan defines the telephone survey data collection tasks performed and presents the methodology used (Section 5.0).

The following sections present the individual test plans that provide specifics on the conduct of the various evaluation tasks.