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that supplies analyses and summaries of data, uses mathematical models to make forecasts and recommendations, and provides the means by which alternative policies and programs may be efficiently considered. An effective BMS should include, as a minimum, formal procedures for:

- (a) Collecting, processing, and updating data;
- (b) Predicting deterioration;
- (c) Identifying alternative actions;
- (d) Predicting costs;
- (e) Determining optimal policies;
- (f) Performing short- and long-term budget forecasting; and
- (g) Recommending programs and schedules for implementation within policy and budget constraints.

§ 500.108 SMS.

An SMS is a systematic process with the goal of reducing the number and severity of traffic crashes by ensuring that all opportunities to improve highway safety are identified, considered, implemented as appropriate, and evaluated in all phases of highway planning, design, construction, maintenance, and operation and by providing information for selecting and implementing effective highway safety strategies and projects. The development of the SMS may be based on the guidance in "Safety Management Systems: Good Practices for Development and Implementation."³ An effective SMS should include, at a minimum:

- (a) Communication, coordination, and cooperation among the organizations responsible for the roadway, human, and vehicle safety elements;
- (b) A focal point for coordination of the development, establishment, and implementation of the SMS among the agencies responsible for these major safety elements;
- (c) Establishment of short- and long-term highway safety goals to address identified safety problems;
- (d) Collection, analysis, and linkage of highway safety data;

20001. Available for inspection as prescribed in 49 CFR part 7, appendix D.

³*Safety Management Systems: Good Practices for Development and Implementation*, FHWA and NHTSA, May 1996. Available for inspection and copying as prescribed in 49 CFR part 7, appendix D.

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(e) Identification of the safety responsibilities of units and positions;

(f) Public information and education activities; and

(g) Identification of skills, resources, and training needs to implement highway safety programs.

§ 500.109 CMS.

(a) For purposes of this regulation, congestion means the level at which transportation system performance is no longer acceptable due to traffic interference. The level of system performance deemed acceptable by State and local officials may vary by type of transportation facility, geographic location (metropolitan area or subarea, rural area), and/or time of day. An effective CMS is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs. The CMS results in serious consideration of implementation of strategies that provide the most efficient and effective use of existing and future transportation facilities. In both metropolitan and non-metropolitan areas, consideration needs to be given to strategies that reduce SOV travel and improve existing transportation system efficiency. Where the addition of general purpose lanes is determined to be an appropriate strategy, explicit consideration is to be given to the incorporation of appropriate features into the SOV project to facilitate future demand management and operational improvement strategies that will maintain the functional integrity of those lanes.

(b) In addition to the criteria in paragraph (a) of this section, in all TMAs, the CMS shall be developed, established and implemented as part of the metropolitan planning process in accordance with 23 CFR 450.320(c) and shall include:

- (1) Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of congestion, identify and evaluate alternative actions, provide

information supporting the implementation of actions, and evaluate the efficiency and effectiveness of implemented actions;

(2) Definition of parameters for measuring the extent of congestion and for supporting the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods. Since levels of acceptable system performance may vary among local communities, performance measures and service thresholds should be tailored to the specific needs of the area and established cooperatively by the State, affected MPO(s), and local officials in consultation with the operators of major modes of transportation in the coverage area;

(3) Establishment of a program for data collection and system performance monitoring to define the extent and duration of congestion, to help determine the causes of congestion, and to evaluate the efficiency and effectiveness of implemented actions. To the extent possible, existing data sources should be used, as well as appropriate application of the real-time system performance monitoring capabilities available through Intelligent Transportation Systems (ITS) technologies;

(4) Identification and evaluation of the anticipated performance and expected benefits of appropriate traditional and nontraditional congestion management strategies that will contribute to the more efficient use of existing and future transportation systems based on the established performance measures. The following categories of strategies, or combinations of strategies, should be appropriately considered for each area: Transportation demand management measures, including growth management and congestion pricing; traffic operational improvements; public transportation improvements; ITS technologies; and, where necessary, additional system capacity.

(5) Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation; and

(6) Implementation of a process for periodic assessment of the efficiency and effectiveness of implemented strategies, in terms of the area's established performance measures. The results of this evaluation shall be provided to decision makers to provide guidance on selection of effective strategies for future implementation.

(c) In a TMA designated as non-attainment for carbon monoxide and/or ozone, the CMS shall provide an appropriate analysis of all reasonable (including multimodal) travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOVs (adding general purpose lanes to an existing highway or constructing a new highway) is proposed. If the analysis demonstrates that travel demand reduction and operational management strategies cannot fully satisfy the need for additional capacity in the corridor and additional SOV capacity is warranted, then the CMS shall identify all reasonable strategies to manage the SOV facility effectively (or to facilitate its management in the future). Other travel demand reduction and operational management strategies appropriate for the corridor, but not appropriate for incorporation into the SOV facility itself shall also be identified through the CMS. All identified reasonable travel demand reduction and operational management strategies shall be incorporated into the SOV project or committed to by the State and MPO for implementation.

(d)(1) Compliance with the requirement that the planning process in all TMAs include a CMS will be addressed during metropolitan planning process certification reviews for all TMAs specified in 23 CFR 450.334. If the metropolitan planning process in a TMA does not include a CMS that meets the requirements of this section, deficiencies will be noted and corrections will need to be made in accordance with the schedule established in the certification review.

(2) Until October 1, 1997, the interim CMS procedures in 23 CFR 450.336(b) may be used to meet the requirement in 23 U.S.C. 134(1) that Federal funds may not be programmed in a carbon

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monoxide and/or ozone nonattainment TMA for any highway project that will result in a significant increase in single-occupant-vehicle capacity unless the project is based on an approved CMS. After September 30, 1997, such projects must be based on a CMS that meets the requirements of this part.

§ 500.110 PTMS.

An effective PTMS for public transportation facilities (e.g., maintenance facilities, stations, terminals, transit related structures), equipment, and rolling stock is a systematic process that collects and analyzes information on the condition and cost of transit assets on a continual basis, identifies needs, and enables decision makers to select cost-effective strategies for providing and maintaining transit assets in serviceable condition. The PTMS should cover public transportation systems operated by the State, local jurisdictions, public transportation agencies and authorities, and private (for profit and non-profit) transit operators receiving funds under the Federal Transit Act and include, at a minimum:

- (a) Development of transit asset condition measures and standards;
- (b) An inventory of the transit assets including age, condition, remaining useful life, and replacement cost; and
- (c) Identification, evaluation, and implementation of appropriate strategies and projects.

§ 500.111 IMS.

An effective IMS for intermodal facilities and systems provides efficient, safe, and convenient movement of people and goods through integration of transportation facilities and systems and improvement in the coordination in planning, and implementation of air, water, and the various land-based transportation facilities and systems. An IMS should include, at a minimum:

- (a) Establishment of performance measures;
- (b) Identification of key linkages between one or more modes of transportation, where the performance or use of one mode will affect another;
- (c) Definition of strategies for improving the effectiveness of these modal interactions; and

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(d) Evaluation and implementation of these strategies to enhance the overall performance of the transportation system.

Subpart B—Traffic Monitoring System

§ 500.201 Purpose.

The purpose of this subpart is to set forth requirements for development, establishment, implementation, and continued operation of a traffic monitoring system for highways and public transportation facilities and equipment (TMS) in each State in accordance with the provisions of 23 U.S.C. 303 and subpart A of this part.

§ 500.202 TMS definitions.

Unless otherwise specified in this part, the definitions in 23 U.S.C. 101(a) and § 500.103 are applicable to this subpart. As used in this part:

Highway traffic data means data used to develop estimates of the amount of person or vehicular travel, vehicle usage, or vehicle characteristics associated with a system of highways or with a particular location on a highway. These types of data support the estimation of the number of vehicles traversing a section of highway or system of highways during a prescribed time period (traffic volume), the portion of such vehicles that may be of a particular type (vehicle classification), the weights of such vehicles including the weight of each axle and associated distances between axles on a vehicle (vehicle weight), or the average number of persons being transported in a vehicle (vehicle occupancy).

Traffic monitoring system means a systematic process for the collection, analysis, summary, and retention of highway and transit related person and vehicular traffic data.

Transit traffic data means person and vehicular data for public transportation on public highways and streets and the number of vehicles and ridership for dedicated transit rights-of-way (e.g., rail and busways), at the maximum load points for the peak period in the peak direction and for the daily time period.