State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

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Subject: **REPORT ON CORRIDOR SYSTEM MANAGEMENT PLANS**

SUMMARY:

The attached report on Corridor System Management Plans (CSMPs) was prepared by the California Department of Transportation (Department) in order to brief the California Transportation Commission (Commission) on the importance of CSMPs in restoring mobility to California and sustaining mobility gains. The Department will make a brief presentation at the February 19, 2009 Commission meeting.

BACKGROUND:

The Commission required CSMPs for corridors in which Corridor Mobility Improvement Account and State Route 99 bond funded projects are programmed. The purpose of the plans is to preserve mobility gains from the investments by managing the corridor for highest sustained productivity. The plans identify a corridor management strategy that all jurisdictions, regional agencies, and modal operators along the corridor agree to and that will guide corridor development, operation, and investments from all sources. The plans are based on diagnostics of the causes of congestion and micro-simulation of all strategies, actions, and projects that determine the most effective mix to restore and preserve corridor productivity. The plans also complement and support activities in the Regional Blueprints efforts, compliance with Assembly Bill 32 and Senate Bill 375, and the implementation of the Smart Mobility Framework.

Attachment

Corridor System Management Plans

1. Overview and Definition

Corridor System Management Plans (CSMPs) are plans to comprehensively manage and operate urban transportation corridors across jurisdictions and modes. The plans include all major transportation elements in the corridor, such as freeways, major parallel local arterials, and transit and rail. The goal is to maximize total corridor productivity and performance by providing the highest sustained throughput of people and freight, while considering all corridor elements. Each corridor is unique due to differing transportation element attributes in each corridor. As an example, the corridor serving travel from Sacramento to El Dorado County would typically include the primary transportation elements of United States Route 50, the major parallel arterial of White Rock Road, and Sacramento Regional Transit District light rail line and commuter/express bus.

The plans are based upon accurate analytics and diagnostics to identify causes of congestion primarily on the freeways and across all elements. System management strategies are then fine-tuned to restore and preserve comprehensive corridor performance across all elements. Once the analysis is complete, a micro-simulation model is developed to test multiple improvement scenarios in order to determine the most effective mix of projects, strategies, and actions that will restore mobility and preserve mobility gains in the corridor. Once identified, these improvements, across all elements, become a plan of action for prioritizing funding from multiple sources (federal, State, local, and measures) among all partners for investment in coordinated and comprehensive improved corridor performance.

The plans are required by the California Transportation Commission (Commission) for all corridors receiving Corridor Mobility Improvement Account (CMIA) and State Route 99 Bond funds from Proposition 1B. Forty-three plans are required. Of the 43 plans, 24 plans are on highly congested urban corridors and 19 are on smaller urban and rural routes. The intent is to preserve mobility gains from these bond project investments, and also maximize and sustain the broader and longer corridor throughput based on continued coordinated and integrated improvements on the freeway, major parallel arterials, rail, and transit. Development of the plans involves extensive collaboration and coordination with regional transportation partners, cities, counties, and modal operators.

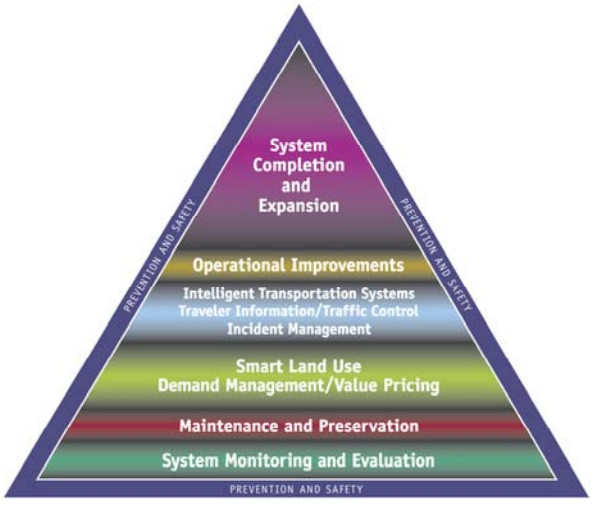
The plans are supportive and complementary to meeting the goals and objectives of the California Regional Blueprint efforts, compliance with Assembly Bill (AB) 32 and Senate Bill (SB) 375 to reduce greenhouse gas emissions, and of the Smart Mobility Framework. The plans will restore and sustain mobility while improving the environment by encouraging smart land use development, compact housing, and increased modal trips.

2. Importance of CSMPs for California's Mobility

The importance of CSMPs to improve and sustain California's mobility can not be overstated. The plans are the way the California Department of Transportation (Department), with regional and local partners, must plan for corridor system management and operations now and in the future. The plans are based upon the concepts presented in the Department's Transportation Management System (TMS) Master Plan that was required by the California State Legislature in 2004. These concepts and this approach are the foundation of the transportation component of the Governor's Strategic Growth Plan (SGP). This approach will restore productivity to the State's transportation system, improve corridor throughput, improve travel time reliability across all corridor elements and ensure economic growth. The SGP is performance-based and outcome-driven. It targets a significant decrease in traffic congestion below today's levels. This will occur even while accommodating growth in population and the economy over the decade with comprehensive system management.

The Department and its regional and local partners recognize that addressing congestion requires a multi-pronged approach, referred to as system management. The approach includes: adding new capacity, maintaining its infrastructure, investing in and encouraging the use of alternative modes (such as transit and rail), encouraging smart land use, transportation management systems, incident management, and other strategies.

The graphic below was modified from the original TMS Master Plan and used throughout the original *GoCalifornia* and later SGP effort. The graphic is referred to as the "mobility pyramid." It identifies the core elements needed for improved and sustained mobility. The base of the pyramid is critical (System Monitoring and Evaluation), as are all of the elements. A strong foundation of system monitoring, evaluation, and performance measurement is a prerequisite for system management across all corridor elements. If one does not know how the system is performing, the system cannot be managed for the highest mobility outcomes.



While we have been deploying high occupancy vehicle (HOV) lanes and ramp metering for some time, we have barely begun to apply comprehensive system management based on performance measurement across all jurisdictions and modes. System management can significantly improve productivity of all elements of the transportation corridor, improving travel times and reliability for all travelers. The TMS Master Plan identifies three principal elements for a managed system that will restore capacity. These are: traffic control (such as ramp meters and improved signal timing with junctions on local arterials), incident management, and traveler information. These elements must be built on a strong foundation of detection in order to measure freeway performance as stated above. Aggressive deployment of these TMS elements could, on the freeway system alone, increase productivity by 20 percent, reduce projected congestion by 20 percent, and improve travel time reliability by 10 percent.

3. Steps for Developing a CSMP

Developing a CSMP is comprised of seven essential steps or milestones. The steps are briefly described below.

Step one – define the corridor limits and major elements. The limits of the corridor, both breadth and length, are determined through a collaborative process of all cities, counties, regional and modal partners and the Department. Each corridor and corridor element is unique. In some corridors there are extensive major local parallel arterials, and in some few to none; the same is true for intercity rail, commuter rail systems, and express bus. The complexity of the corridor is a primary factor in meeting milestone dates and adopting and implementing the CSMP.

Step two – assemble the corridor team. At a minimum, all cities, counties, regional partners and modal agencies should be assembled. The corridor team will guide development of the CSMP. Development of a charter to conduct its development is strongly encouraged. Cities and counties typically appoint staff to the team from their traffic operations and system management functions. Regional agency representation is from both planning and operations considering the organization of each agency. For example, the Metropolitan Transportation Commission and San Diego Association of Governments have distinct traffic operations and system management units as do other large transportation agencies. Representation from modal agencies is typically from the short and long-range planning functions. The Department is typically represented by traffic operations, planning, and travel forecasting and analysis.

Step three – conduct preliminary performance assessment. This step identifies how the corridor is performing now across all elements. As the freeway element is typically the most highly congested and responsible for the highest amount of delay, the initial assessment focuses on this element. This includes identifying the numbers, locations and types of accidents (referred to as incidents), amount and location of daily vehicle hours of delay, duration, and direction of delay. The basic assessment of other elements is also

performed in this step, such as identifying the numbers of passengers on rail systems, headways, and any major delays.

Step four – ensure that freeway detection is in place and working or is planned and funded. Detection provides real-time information on freeway performance through the Performance Measure System (PeMS). Where detection is not in place or cannot be rapidly planned and funded, there are other methods, although not ideal, to collect the data. Embedded detection provides a much higher diagnostic tool through PeMS to evaluate freeway system performance. Currently, the Department is funding a prototype demonstration in San Diego to test using PeMS to measure major local arterial performance and to link to modal operations for real-time traveler information.

Step five – conduct comprehensive performance assessment. This is the detailed, depth analysis and diagnosis of the causes of congestion in the corridor. It is digging deeper into every component that may be causing system under-productivity and identifying how the components, taken as a whole, are reducing corridor throughput. It may include, for example, examining current ramp metering algorithms, signal timing schemes on major local arterials, and at ramp termini intersecting with a local street.

Step six – identify causality. This step is the definitive step to confirm the exact causes of the congestion. All corridors will have either different causes for congestion or differ in the magnitude of congestion caused by each factor. Each corridor is highly unique.

Step seven – develop micro-simulation model and test improvement scenarios. This step models multiple scenarios to improve and sustain corridor performance to identify the most effective mix of projects. Scenarios may include, for example, a mix of infrastructure improvements such as adding general purpose lanes or HOV lanes, constructing State route to State route direct connectors, or lower cost and highly effective transportation system management strategies such as traffic control through more aggressive ramp metering, synchronized signal timing on major local arterials, and expanded rail or transit. The mix of improvements modeled is unique to each corridor and input from the guiding team.

CSMP Adoption and Implementation – On completion of the CSMP, the plan should be adopted or approved by the entities of the corridor team as a mutual plan to improve, manage, and operate the corridor. This includes funding and scheduling of improvements based upon the most effective staging. For example, installation of transportation system management components may provide more near-term congestion relief while planning for and funding higher cost infrastructure or system expansion improvements will provide longer-term relief.

4. Major Opportunities for Connecting Plans, Programs and Actions

CSMPs are the new way of doing corridor and system management planning in California. The plans are required as part of the Regional Transportation Plan guidelines

adopted by the Commission. The plans can satisfy the federal requirements for Metropolitan Planning Organizations (MPOs) to have a performance measurement system, congestion management system, and operations strategy in place. The Commission could utilize the action plan produced for plan implementation as a "check-list" of how Regional Improvement Program funds are being directed towards the most effective projects or management strategies in a corridor including local arterials and rail/transit.

This is the first generation of CSMPs and much is being learned during their development. This is true both for understanding the complexity of factors involved in corridor performance across all elements as well as the most effective mix of projects, strategies, and actions to improve and sustain performance. As transportation technologies evolve and integrated corridor management techniques are rooted into corridor operations, the following generations of plans will evolve to be more robust. The team concept of all partners at the table to prepare a comprehensive corridor management plan, fund and carry out the plan in a coordinated manner, and measure and evaluate system performance across and among all elements is critical to restoring mobility to California.

5. Importance of CSMPs for Sustaining the Environment

CSMPs will complement an effective response to implementation of AB 32, SB 375, Regional Blueprints, and the Smart Mobility Framework. Summarized below are major areas where they will add value.

AB 32 – California Global Warming Solutions Act of 2006. AB 32 requires the State Air Resources Board (ARB) to adopt a statewide greenhouse gas emission limit equivalent to the statewide greenhouse gas emission levels in 1990 to be achieved by 2020. Effective system management will smooth speeds to reduce or ultimately eliminate the "stop/start" and slowing conditions experienced by motorists on the freeway. This will reduce emission rates of pollutants caused by congestion.

SB 375 – This new law supports compliance with AB 32. The law is complex and places responsibilities primarily on the MPOs. The law requires the MPOs to prepare a sustainable communities strategy (SCS) that among multiple other considerations set forth a forecasted development pattern for the region, which when integrated with the transportation network, and other transportation measures and policies, will reduce greenhouse gas emissions. CSMPs will contribute to the development of the SCS and as applicable the alternative planning strategy by providing information on the most effective projects, strategies, and actions to restore throughput thus reducing emissions.

California Regional Blueprint Planning Program – Regional blueprint planning is a critical tool for implementing the Governor's Strategic Growth Plan to build the infrastructure needed to accommodate California's future growth, reduce congestion and support economic vitality. It can lead to more transportation and housing choices so that

Californians have options to walk, bicycle, or take transit to reduce green house gases while sustaining air quality, equitable transportation and housing choices, vibrant communities, and the environment.

Smart Mobility Framework – This project is an innovative effort to develop a measurement framework based on best practices across California and the nation. It will create an evaluation framework to assess how well plans, proposals, or projects meet principles of Smart Mobility. The projects, strategies, and actions in the CSMPs will be reviewed for effectiveness based on these principles.