Appendix O: SANDAG Federal Congestion Management Process

Contents

Table of Figures

SANDAG Federal Congestion Management Process

Introduction

The Federal Highway Administration (FHWA) 23 CFR §450.322 requires that each transportation management area (TMA) address congestion management through a process involving an analysis of multimodal, metropolitan-wide strategies. These are to be developed cooperatively to foster safety and integrated management of new and existing transportation facilities that are eligible for federal funding. The requirements specifically state that "in TMAs designated as nonattainment for ozone or carbon monoxide, the congestion management process shall provide an appropriate analysis of 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 single-occupancy vehicles (SOVs) is proposed to be advanced with federal funds." Additionally, the guidelines state that "federal funds may not be programmed for any project that will result in a significant increase in the carrying capacity for SOVs (i.e., a new general-purpose highway in a new location or adding general-purpose lanes, with the exception of safety improvements or the elimination of bottlenecks), unless the project is addressed through a congestion management process meeting the requirements of this section."

SANDAG is the designated TMA for the San Diego region. The Regional Plan serves as the region's Regional Transportation Plan (RTP) and meets the requirements of 23 CFR §450.322. The functional elements of the federal congestion management process include: (1) performance monitoring and measurement of the regional transportation system; (2) multimodal alternatives and non-SOV analysis; (3) the provision of congestion management tools; and (4) integration with the Regional Transportation Improvement Program (RTIP) process. An additional component of the federal congestion management process is periodic review of the process. The SANDAG Federal Congestion Management Process was last reviewed in 2023, no significant updates were identified.

Background

California Proposition 111, passed by voters in 1990, established a requirement that urbanized areas must prepare and regularly update a Congestion Management Program. The requirements within the state Congestion Management Program were developed to monitor the performance of the transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. SANDAG provided regular updates for the state's Congestion Management Program from 1991 through 2008. In October 2009, the San Diego region elected to be exempt from the state's Congestion Management Program. SANDAG continues to follow federal Congestion Management Process regulations, which consist of a performance monitoring process and required analysis for projects that increase the carrying capacity of SOVs.

Congestion Management Process Elements

The Congestion Management Process (CMP) is cyclical; successive elements inform subsequent elements in an iterative process. The CMP is reviewed with each update of the Regional Plan for improvements in efficiency, data sources, and strategies. The following elements are a part of the CMP[1]: regional objectives, multimodal transportation network, performance measures, data collection, analysis of congestion, strategy identification, strategy implementation, and evaluation. Figure O.1 illustrates these elements paired with corresponding SANDAG processes. The following section describes each SANDAG process within the context of the CMP.

Figure O.1: Congestion Management Process Elements – Federal Guidance/ SANDAG Process

Notes: PeMS – Performance Measurement System; MTS – Metropolitan Transit System; NCTD – North County Transit District; ITS – Intelligent Transportation System; TDM - Transportation Demand Management; TSM – Transportation System Management; AT – Active Transportation; ICMS – Integrated Corridor Management Study.

[1] Based upon the FHWA Congestion Management Process Guidebook (2011).

Develop Regional Goals

SANDAG updates the Regional Plan every four years, the Board of Directors discusses the Regional Plan's goals, and strategies (introduced in **Chapter 1: Overview**).

Given the challenges, anticipated growth, and opportunities that technology can provide to transform our region, the Regional Plan is guided by four primary goals:

Goals:

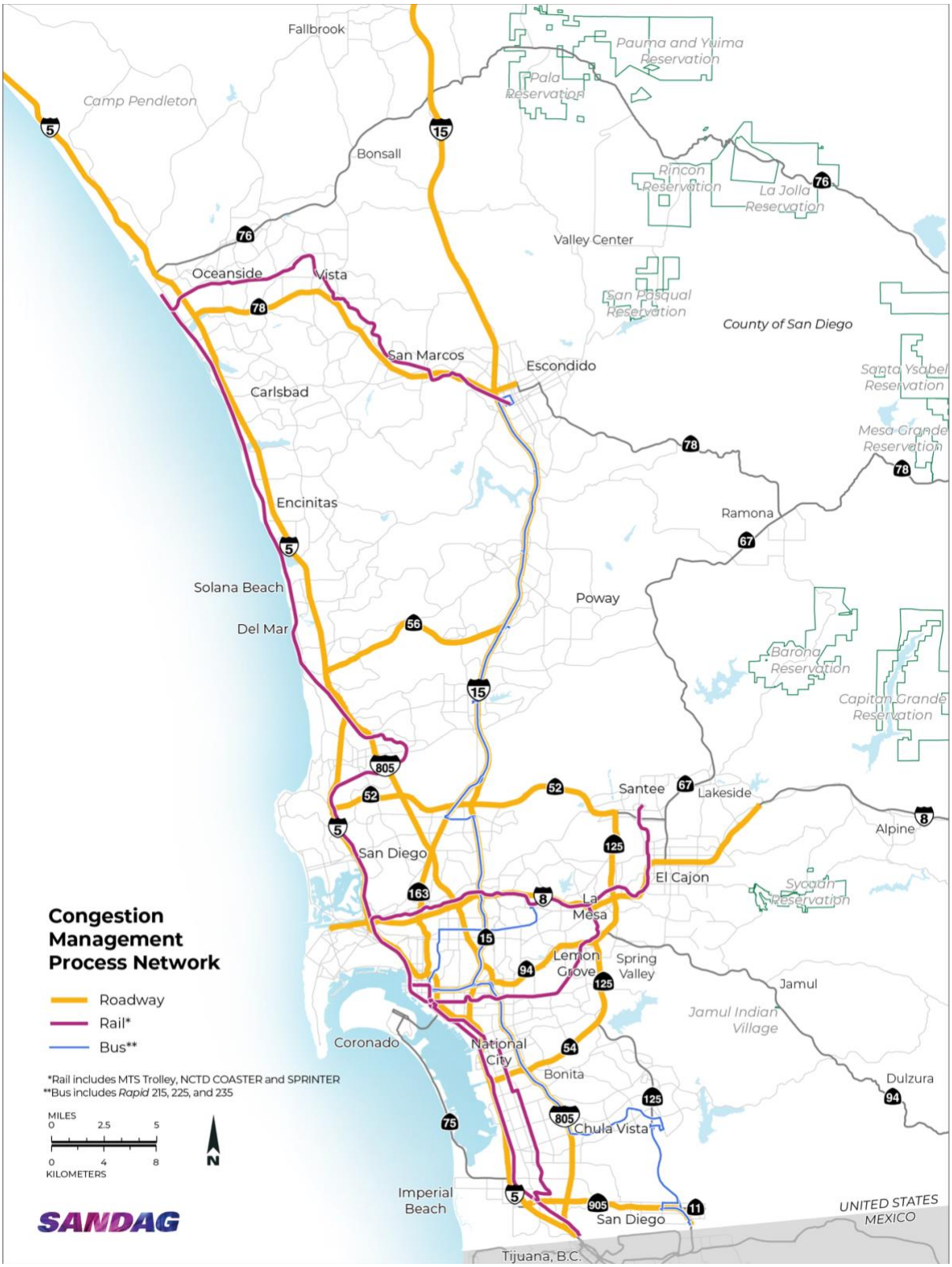
- **Convenient** and reliable movement of people and goods
- **Equitable** access to essential needs and opportunities
- **Healthy** communities and environment for everyone
- **Safe** transportation network for all users

Define the Congestion Management Process Network

The CMP requires a multimodal transportation network that is developed regionally to monitor and analyze performance. The CMP multimodal network of access-controlled freeways, highways, railways, and select bus routes, illustrated in Figure O.2, was updated with the 2019 Federal RTP, reviewed for updates in 2023, and continues in this form for the 2025 Regional Plan. This network was developed with input from Caltrans, the County of San Diego, and the 18 cities in the SANDAG planning area.

The freeway and highway corridors are instrumented with equipment that monitors system performance. Caltrans operates this equipment within its PeMS. This system enables SANDAG to monitor and analyze observed data. More than half of the region's vehicle miles traveled are carried by this network of freeways and highway corridors. All railways and select bus routes that are on or closely parallel to highway corridors are also included. Bus routes include Rapids 215, 225, and 235.

Figure O.2: Congestion Management Process Network



Source: SANDAG

Develop Multimodal Performance Measures

The CMP network matches the SANDAG State of the Commute (SOC) network, a reporting program that monitors the performance of the transportation network and provides information on freeway, transit, and local roadway use and performance data collected annually. The SOC includes multimodal performance measures that use observed data to monitor the system's performance over time. These measures were developed with input from Caltrans, local jurisdictions, and transit operators. As new data become available, they are evaluated for new performance measures across this network. Current performance measures that are being monitored include:

- Average travel time
- Screenline average annual daily traffic
- Average weekday transit ridership (screenline, select routes)
- Transit passengers per revenue mile (select routes)
- Active transportation counts

Collect Data/Monitor System Performance

Data collected to support the SANDAG CMP include: PeMS, transit operations, count programs, and travel time data. Routine review of performance measures on the CMP network allows SANDAG to determine if there has been a reduction of service. The SOC reporting program compiles these datasets and organizes them for comparison over time. This enables high-level system monitoring.

Analyze Congestion

SOC reporting presents an in-depth analysis of congestion for the CMP network in addition to larger trends that impact travel demand. The SOC includes economic and demographic data, and it provides context for changes to the San Diego region relative to peer cities across the nation. Detailed reports are generated annually. These reports help inform the region's planning and programming processes.

The SOC analysis includes the CMP multimodal performance measures. Each major roadway corridor is evaluated by morning and afternoon peak-period delay, as well as travel time reliability over successive years. Transit is analyzed by load factor and passengers per revenue mile, among other metrics. The regional analysis includes a summary of significant changes in performance, operations, and investments.

The **2023 SOC Report** reviews ten years of data to establish regionwide trends in freeway travel, delay, and transit ridership on multiple modes. These and other transportation performance metrics are presented in the context of population, employment, and economic activity growth values. Past SOC reports are available on the **SANDAG SOC webpage**.

Identify and Assess Strategies

Facilities within the CMP network are guided by comprehensive multimodal corridor plans. These plans help identify strategies appropriate for the corridor. This process begins with understanding the characteristics and performance of the corridor and surrounding network. Land use and future growth are also considered when identifying appropriate strategies. SANDAG has developed a suite of strategies for consideration in each corridor plan.

Strategies for addressing congestion can focus on transportation system development, TSM, or TDM strategies. Improvements that focus on transportation system development are those that focus on improving access, providing priority treatments, or providing dedicated lanes that support and increase the use of multimodal travel options. TSM improvements aim to use the existing or future transportation system more efficiently. TDM reduces congestion by decreasing SOV trips and shifting trips to other modes or off-peak travel periods.

SANDAG has identified several proposed strategies that address congestion that include transportation system development, TSM, and TDM. These strategies focus on leveraging existing and emerging technologies to optimize system management and operations for the multimodal transportation system while also considering advancements in transportation services to improve TDM services. Historically, the implementation of these strategies was carried out independently and only addressed project-specific needs; rarely were these systems or services designed and operated to meet the needs of multimodal networks and travelers, and seldomly were they integrated to make the entire transportation system work optimally.

The Regional Plan's undertaking of Complete Corridors, transit, Flexible Fleets, and transportation system management, along with consideration of areas with a high concentration of transportation options, density, and where people travel often, directly addresses the implementation of these strategies. An integrated and multimodal transportation system offers improved access to transportation alternatives for meeting the need for all transportation users to help address congestion, improve system performance, and increase safety. Together, these proposed strategies will result in a transportation system that is greater than the sum of its parts. Each strategy will tackle an aspect of the total system, but the success of each will rely on the success of the others.

At the heart of the proposed congestion management strategies is the implementation of transportation system management which will knit together the region's numerous transportation management systems and will enable Complete Corridors, transit, and Flexible Fleets to work seamlessly and optimize the transportation system for all users. Transportation system management will be the digital network that analyzes data in real time from the region's physical networks, making them all work better—more integrated, more efficient, and most of all, more responsive to help address congestion.

A menu of proposed strategies that will be considered are detailed below. This list is not meant to be exhaustive. These strategies are regularly reviewed for updates and improvements.

Transportation System Management (TSM) Strategies

- Traveler information programs aim to increase awareness and the information available on travel choice and impact so that travelers can actively participate in reducing both network demand and personal trip impact. The program includes education outreach campaigns to raise awareness of the direct relationship that route choice, personal driving habits, and trip timing have on fuel consumption, vehicle operating expenses, and vehicle emissions, and encourage carpooling, transit, bike or walk.

- Smart arterial management focuses on managing arterial roadways (major streets) to reduce delays, resulting in quicker trips and lower vehicle emissions. Improvements to arterial detection and signalswill provide the ability to create a traffic signal system that is dynamic and coordinated throughout the region. Improving the flow of traffic on arterial roadways is among the most cost-effective TSM strategies for reducing stop-and-go traffic, cutting overall travel times, and lowering fuel consumption and pollution.
- Freeway management is responsible for deploying systems that improve the operational efficiency of freeway control infrastructure; enabling freeway managers to have greater control over vehicle operating speeds; and facilitating the freeway managers' ability to communicate the impact of events, incidents, and congestion to the traveling public. It also provides freeway managers with greater operational visibility of conditions on and off network. Some of the systems included in this program include traffic detection technologies, closed-circuit television cameras, ramp meters, electronic message signs, and the Advanced Transportation Management System, which provides central monitoring and sign control for managing incidents.
- Transportation technology builds on Integrated Corridor Management to dynamically monitor, control, and influence travel demand, traffic demand, and traffic flow of key corridors. Transportation technology facilitates the use of transportation alternatives through various approaches, including dynamic ridesharing, dynamic speed limits, dynamically priced parking, and predictive traveler information to improve overall highway efficiency.
- The Regional Border Management System serves as the transportation management tool that will manage cross-border traffic and will include border-specific congestion management strategies, including congestion pricing, an approach to lane management, and traveler information strategies.
- Transit management refers to active management of the bus and light rail system in the region. It includes a regional scheduling system, a regional transit management system, positive train control, and centralized train control.

Transportation Demand Management Strategies

- Sustainable Transportation Services is the regional TDM program that coordinates services aimed at increasing the number of commuters who carpool, vanpool, take transit, bike, walk, and telework. This includes the SANDAG Vanpool Program, employer outreach program, support for teleworking, bike encouragement and education programs, and regional campaigns like Clean Air Day and Bike Month.
- Planning for communities with a high concentration of people, destinations, and travel choices are a key TDM strategy. They offer on-demand travel options and supporting infrastructure to enhance connections to high-quality transit services while helping people make short trips around the community on Flexible Fleets. These communities can span one, two, or a few miles based on community characteristics and are uniquely designed to fulfill a variety of travel needs while strengthening a sense of place.
- Flexible Fleets are shared, on-demand transportation services that provide convenient and personalized travel options. While they build on the popularity of services such as rideshare, bikeshare, and scootershare, fleets can also include neighborhood shuttles and delivery services. These fleets provide services for all types of trips, which can reduce the need to own a car.

SANDAG supports these strategies with planning resources for local agencies, developers, and mobility operators. The 2022 Regional Parking Inventory and Behavioral Survey Study and Regional Parking Management Toolbox are two planning products supporting these strategies. The Regional Parking Inventory and Behavioral Survey Study presents parking inventory and parking choice data that provides the basis for the updated activity-based model parking models that more accurately represent parking choices now and, in the future, and can be used to measure the impact of pricing and parking demand management policies. The **Regional Parking Management Toolbox** aims to help local governments manage parking effectively to support smart growth and reduce traffic. SANDAG plays a role in providing a Flexible Fleet cooperative agreement for jurisdictions to use and provides opportunities to apply for Flexible Fleet pilot funding.

Program and Implementation Strategies

Corridor managers and planning and programming staff review traffic performance data to identify corridors with reduced performance. Strategies to improve the condition must be context sensitive and fit the corridor's needs. The menu of CMP strategies offers a variety of approaches, and additional strategies are reviewed as requested. Once a strategy is selected, it is programmed through the RTIP. The RTIP is a multi-billion-dollar, five-year program of major highway, transit, arterial, and nonmotorized projects funded by federal and state taxes, TransNet local sales tax, and other local and private funding.

The RTIP serves as a prioritized program designed to implement the region's overall strategy for providing mobility and for improving the efficiency and safety of the transportation system while reducing transportation-related air pollution. This supports efforts to attain federal and state air quality standards for the region. SANDAG supports implementation strategies through a variety of programs and tools. These same programs and tools can be used to help select strategies. A list of implementation strategies is included in Chapter 3 Implementation Actions.

Evaluate Strategy Effectiveness

Evaluation of strategy effectiveness relies on locally observed data as well as larger professional studies. Where possible, SANDAG reviews observed data prior to and after the implementation of congestion reduction strategies. The transition to the instrumented PeMS highway network—and continued collaboration with transit operators—will greatly improve this evaluation process. Professional studies are used to evaluate strategies that are more difficult to isolate. This is often the case with small-scale projects and highly complex projects.

Multimodal Alternatives and Non-Single-Occupancy Vehicle Analysis

In addition to the CMP elements, TMAs that include a nonattainment or maintenance area for air quality are required to conduct additional analysis for projects that add SOV capacity. The SOV Capacity Analysis is limited to projects that add general-purpose lanes on the CMP network that are not addressing an identified safety or bottleneck concern. Projects subject to this analysis are required to demonstrate that appropriate, non-capacity-increasing strategies were evaluated. If this evaluation finds that the strategies do not meet the needs for additional capacity in the corridor, then the project can proceed with adding SOV capacity. This analysis is a requirement to program a capital phase of the project.

SANDAG has implemented CMP checks in its programming process. Project sponsors enter data in an online data portal, **ProjectTrak**, to request inclusion in the RTIP. Projects that use federal funds and are capacity increasing are flagged for further review. Figure O.3 shows the process for identifying projects that require SOV analysis.

Corridor plans, following the Caltrans Corridor Planning Process Guide and environmental review documentation, have been identified as appropriate SOV Capacity Analysis for the proposed CMP. These documents are uploaded to ProjectTrak for SANDAG review and archival. Projects that advance through this process are to incorporate, per federal regulation, all reasonable TDM and operational strategies into the project.

Figure O.3: Single-Occupancy Vehicle Analysis Process