

# THE RIVERSIDE COUNTY CONGESTION MANAGEMENT PROGRAM: USING TECHNOLOGY TO EFFICIENTLY MONITOR TRAFFIC CONGESTION

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## ABSTRACT

Congestion management is an important aspect of a sustainable transportation future. Traffic congestion consumes excess fuel and produces excess vehicle emissions that are contrary to the goals of sustainability. In addition, the effective management of traffic congestion plays a key role in mode choice and financing for a balanced transportation system.

The Riverside County Congestion Management Program (CMP) requires transportation analysts to monitor a very large system of roadways every two years to provide an evaluation of traffic congestion. Riverside County, California is nearly 200 miles across, stretching from the Colorado River to within 14 miles of the Pacific Ocean, covering a total area of over 7,200 square miles.

The Riverside County Transportation Commission (RCTC) is responsible for preparation of the CMP. Since traffic data collection is expensive, RCTC has come up with innovative technologies and solutions to the problem of gathering data to monitor an extensive network of roadways that make up the CMP system. These solutions include:

- ◆ California Performance Measurement System (PeMS) Data
- ◆ Smart Call Boxes
- ◆ Floating Car Runs
- ◆ Traditional Traffic Count Data

This paper provides a description of these data collection technologies as well as the roadway capacity analysis techniques used to measure traffic congestion and the regulatory requirements for state and federal CMP compliance. Additional detail is provided in innovative areas such as the use of smart call boxes and the use of speed versus traffic counts to monitor the performance of freeways.

## INTRODUCTION

In the State of California, the Congestion Management Program (CMP) was first established in 1990 under Proposition 111. Proposition 111 established a process for each metropolitan county in California to designate a Congestion Management Agency (CMA) that would be responsible for development and implementation of the CMP within county boundaries. The Riverside County Transportation Commission (RCTC) was designated as the CMA for Riverside County in 1990, and therefore, prepares CMP updates in consultation with the Technical Advisory Committee (TAC), which consists of local agencies, the County of Riverside, transit agencies, and sub-regional agencies. The location and some of the major features of Riverside County are shown in Figures 1 and 2.

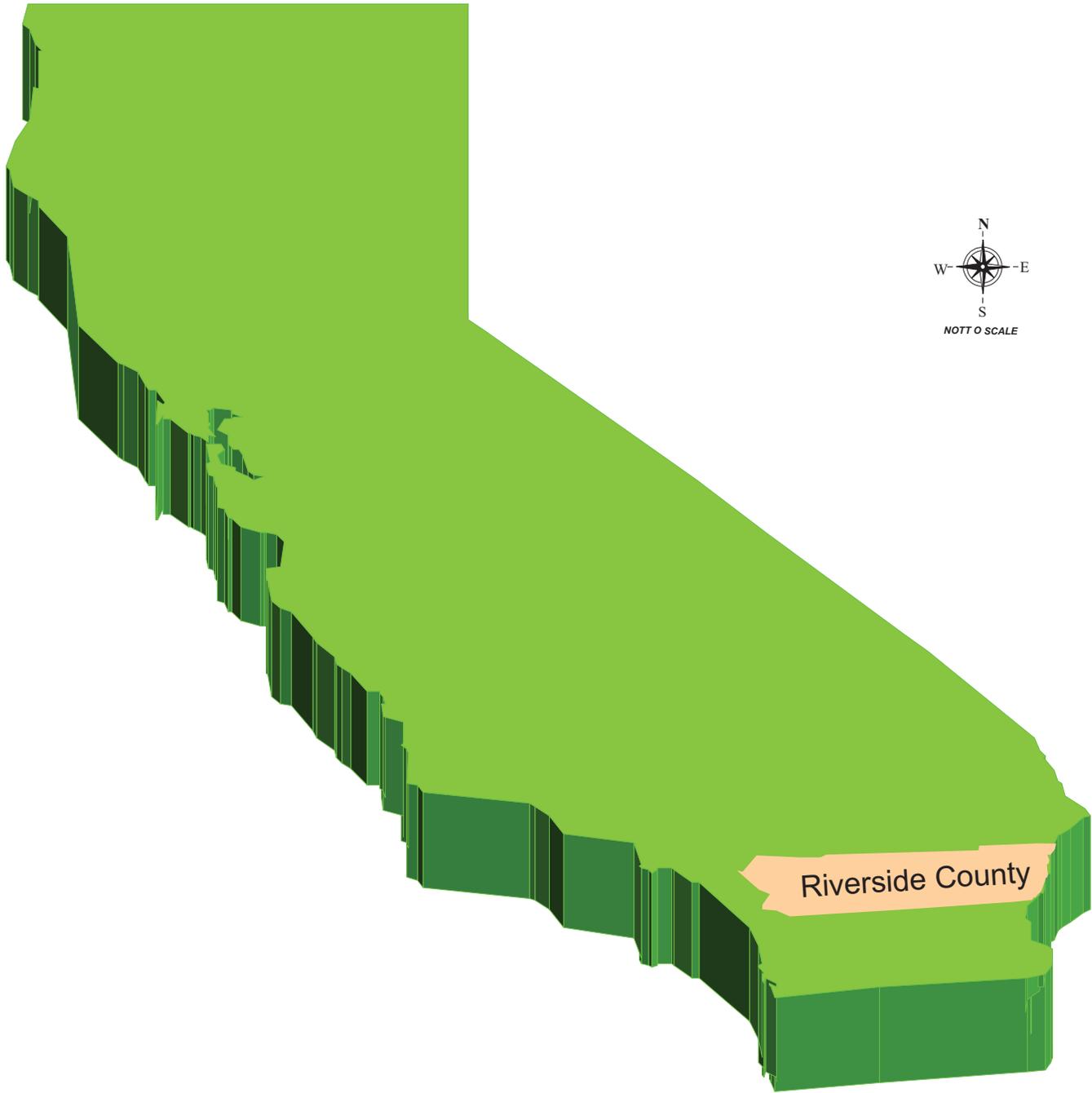
The intent of the CMP is to more directly link land use, transportation, and air quality, thereby promoting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Counties within California have developed CMP's with varying methods and strategies to meet the intent of the CMP legislation.

The Riverside County CMP was significantly modified in 1997 to focus on federal Congestion Management System (CMS) requirements as well as incorporate elements of the state CMP requirements. The 1997 CMP also focused on development of an Enhanced Traffic Monitoring System in which real-time traffic count data can be accessed by RCTC to evaluate the condition of the CMS, as well as meet other monitoring requirements at the state and federal levels. This monitoring effort was completed in 2004, which consisted of installing Smart Call Boxes (traffic counters in Call Box equipment) and traffic counters at Caltrans' Traffic Management Center (TMC) sites along the state highway system. Monitoring of the CMP system on local arterials will continue to occur through the Coachella Valley Association of Governments' (CVAG) monitoring program and through local agency monitoring efforts in Western Riverside County.

RCTC's adopted minimum Level of Service (LOS) threshold is LOS "E". Therefore, when a CMP street or highway segment falls to "F", a deficiency plan must be required. Preparation of a deficiency plan will be the responsibility of the local agency where the deficiency is located. Other agencies identified as contributors to the deficiency will also be required to coordinate with the development of the plan. The plan must contain mitigation measures, including consideration of Transportation Demand Management (TDM) strategies and transit alternatives, and a schedule for mitigating the deficiency.

To insure that the CMP is appropriately monitored to reduce the occurrence of LOS deficiencies, it is the responsibility of local agencies, when reviewing and approving development proposals, to consider the traffic impacts on the CMP System. When a deficiency is identified as part of the CMP Update LOS evaluation process, further detailed analysis of LOS must be conducted to determine whether an actual deficiency has occurred. The LOS analysis conducted as part of the CMP Update process is only considered to be a "screening" level analysis, therefore additional, more detailed assessment of a potential deficiency would be required before a deficiency is formally identified. Coordination with the affected local jurisdiction(s) is made to insure that appropriate data, geometrics, counts and other related information is applied to calculate LOS.

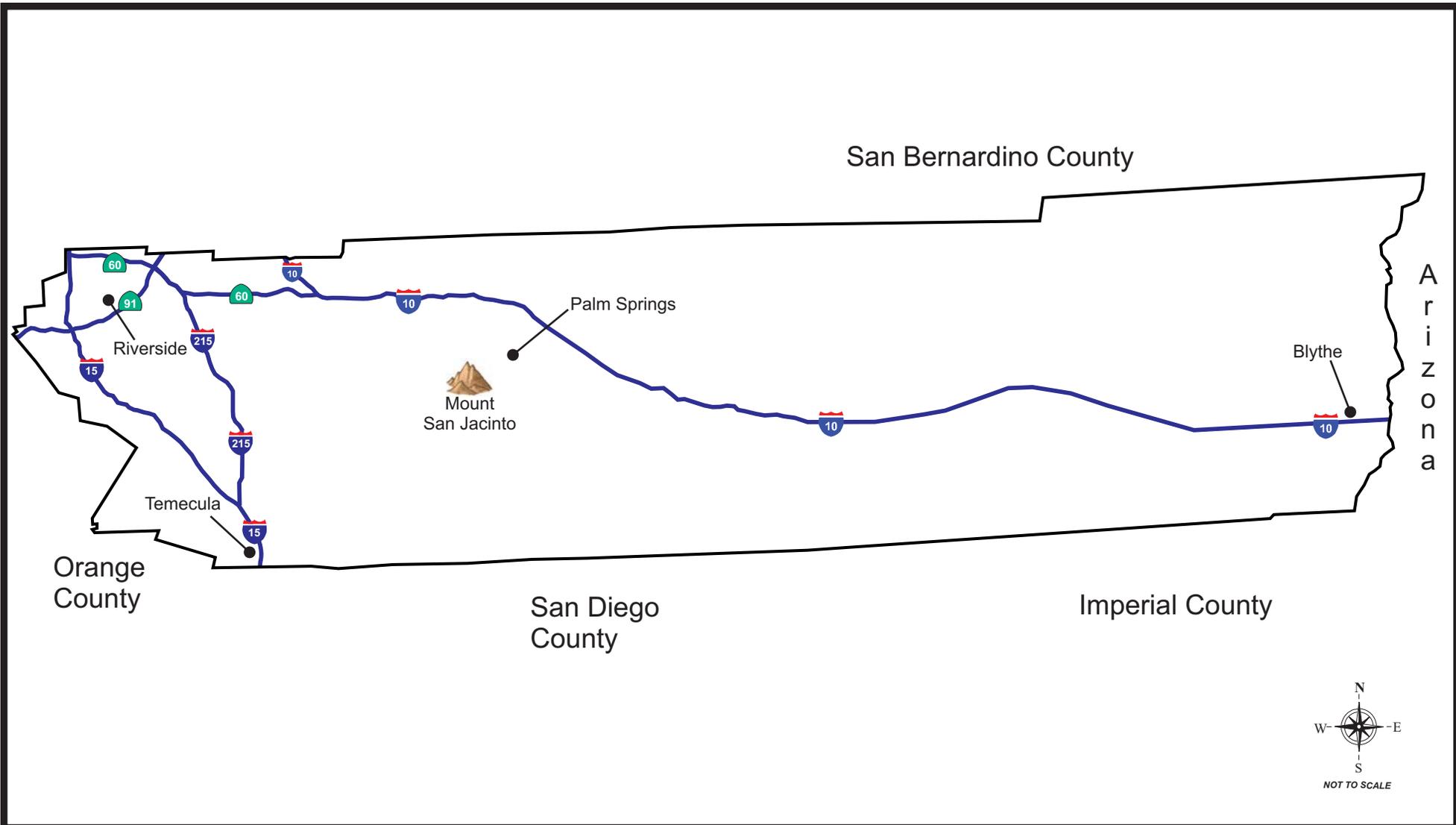
During preparation of the 2011 CMP, deficiencies were found on the CMP System based upon this year's monitoring effort. These segments will continue to be monitored to determine if the deficiencies reflect temporary or permanent conditions. If it is determined that the deficiencies are permanent and not related to construction or other activities along a segment or elsewhere, a deficiency plan will be required to address the deficiency.



Location of Riverside County

Figure 1





Major Features of Riverside County

Figure 2

**Legend**

-  Freeway
-  State Highway
-  Interstate Highway



This paper summarizes each element of the state CMP legislation and federal CMS requirements. Below is a summary of various topics highlighting the Riverside County CMP's approach in meeting the state CMP and federal CMS requirements.

## **DESIGNATION OF A SYSTEM OF ROADWAYS AND HIGHWAYS**

RCTC has designated a system of Highways and Principal Arterials to comprise the CMP system. All State highways within Riverside County have been included in accordance with CMP statutes, and a set of Principal Arterials has been identified.

## **SYSTEM PERFORMANCE STANDARDS**

For purposes of the CMP, LOS analysis for intersections and segments along the CMP System of Highways and Roadways, under current or existing conditions, is required to be developed using Highway Capacity Manual (HCM)-based methods.

Considering the transportation financing program in Riverside County established through Measure A (the local half-cent sales tax program for transportation), there are no advantages to set a higher minimum LOS standard than required by CMP legislation, LOS "E". As a result, the minimum LOS standard for intersections and segments along the CMP System of Highways and Roadways shall be "E" unless the intersection or segment had a lower LOS (LOS "F") in 1991. Such facilities are exempt from CMP deficiency plan requirements.

## **PUBLIC TRANSIT SYSTEM STANDARDS**

To meet the requirements of the Statutes, the performance measures outlined in the Short Range Transit Plans prepared by transit agencies in Riverside County are included in the CMP. In 2005, RCTC approved a Productivity Improvement Program (PIP) as part of a comprehensive effort to work with the county's eight public transit operators to provide better service and improve efficiency. The PIP identifies performance targets in which transit operators will strive to meet in developing its SRTP service and financial plan.

## **TRAFFIC DATA COLLECTION/ENHANCED TRANSPORTATION SYSTEM MANAGEMENT PROGRAM**

This element of the CMP describes the traffic data collection process to assess land use decision impacts on the Congestion Management System. Under the program, RCTC, CVAG and Caltrans are the agencies in Riverside County responsible for the traffic count data collection process. The count data can also be applied to comply with state and federal Congestion Management Plan/Congestion Management System/Transportation Management System (CMP/CMS/TMS) data collection requirements.

For the purposes of the CMP, traffic count data was collected from the following sources:

- ◆ Speed data collected from California Performance Measurement System (PeMS)
- ◆ Traffic count data from RCTC Smart Call Boxes
- ◆ Traffic count data from Caltrans
- ◆ Traffic count data provided by local agencies

For each roadway segment in the CMP, an effort was made to collect as much data as feasible in order to have a system of checks and balances to investigate and correct any errors or discrepancies in the data and results.

## ROADWAY CAPACITY ANALYSIS

Roadway capacity analysis was conducted as follows:

- ◆ For freeway locations where PeMS data was available, freeway speeds were considered to be the primary indicator of traffic congestion.
- ◆ For locations with Smart Call Boxes, the count data obtained from the Smart Call Boxes was considered to be the primary source of data. Roadway segment capacity analysis was conducted using Modified HCM LOS Tables (also known as Florida Tables).
- ◆ Caltrans or local traffic count data was considered to be the primary source of data where no PeMS data or Smart Call Box data was available and roadway segment capacity analysis was conducted using the Modified HCM LOS Tables.
- ◆ Floating car runs were conducted to validate the PeMS data and in locations where a second check of results was considered to be needed for any of the conditions described above.

Of the roadway segments analyzed as part of the CMP, seven were shown to have deficiencies based on level of service E threshold, as shown in Table 1. Of these locations, all had an upcoming improvement project, resulting in no need to prepare a deficiency plan for any roadway in the system for the 2011 CMP.

## LOS DEFICIENCY PLANS

Deficient segments or intersections are identified through the biennial traffic monitoring process. When a deficiency is identified as part of the CMP Update LOS evaluation process, further detailed analysis of LOS is conducted to determine whether an actual deficiency has occurred. The LOS analysis conducted as part of the CMP Update process is only considered to be a "screening" level analysis, therefore additional, more detailed assessment of a potential deficiency would be required before a deficiency is formally identified. Coordination with the affected local jurisdiction(s) is made to insure that appropriate data, geometrics, counts and other related information is applied to calculate LOS.

The local agency where the deficiency is located is responsible for the preparation of the deficiency plan. RCTC will prepare deficiency plans on the State Highway System when deficiencies are identified and will coordinate the development of the deficiency plan with affected local jurisdictions.

## TRANSPORTATION DEMAND MANAGEMENT (TDM)/AIR QUALITY

In 1991, all local agencies adopted TDM ordinances. In 1996, the State changed the CMP from a mandatory program to a voluntary program; therefore, RCTC has not required agencies to update their respective TDM ordinances. There are effective ways of achieving trip reduction in Riverside County other than through the adoption of local agency Transportation Demand Management (TDM) Ordinances, which was the focus of TDM efforts in the past. RCTC believes that there are other approaches that can be more effective and has facilitated the implementation of TDM projects through the Measure "A" Commuter Assistance Programs, and the implementation of a number of TDM projects (in cooperation with Caltrans and local agencies in Riverside County and in adjoining counties) to achieve TDM objectives. Such TDM

**Table 1**  
**RCTC CMP**  
**Roadway Deficiency Analysis**  
**Selected Segments of I-15/I-215/SR 79/Alessandro**

Roadway	Segment	Deficient Per Floating Car Runs (Y/N)	Deficient Per Traffic Volumes (Y/N)	Overriding Considerations (Y/N)	Reason for Overriding Considerations	Multi-Modal Aspect
I-15	SR-60 to Limonite Ave	Y	N/A	Y	I-15 Corridor Improvement Project, SR-91 Corridor Improvement Project	Tolled Express Lanes/HOV Lanes
	2nd St to SR-91	Y	N/A	Y	I-15 Corridor Improvement Project, SR-91 Corridor Improvement Project	Tolled Express Lanes/HOV Lanes
	Magnolia Ave to Weirick Rd	Y	N/A	Y	I-15 Corridor Improvement Project, SR-91 Corridor Improvement Project	Tolled Express Lanes/HOV Lanes
I-215	Nuevo Rd to SR-74 (4th St)	N/A	Y	Y	I-215 Widening Project, I-215/SR-74 Interchange Reconstruction Project	Perris Valley Line
Van Buren Blvd	Washington St to Wood Rd	N/A	Y	Y	TUMF Regional Arterial Project	Existing RTA transit service
	Orange Terrace to I-215	N/A	Y	Y	I-215 Interchange Project	Existing RTA transit service, Perris Valley Line
Ramon Rd	I-10 to Bob Hope Dr	N/A	Y	Y	I-10 Interchange Project	Existing SunLine Transit Agency service

strategies include the development of Park-N-Ride lots, commuter rail stations, and public transit feeder services.

In addition to TDM, Transportation Systems Management (TSM) strategies also provide for smoother traffic flow, especially along congested streets and highways in the County. Types of TSM strategies already implemented in Riverside County include bus bays, signal coordination systems, signal preemption for transit vehicles, improved signal timing projects, ramp metering, and focused intersection improvements.

Taken together, the individual programs, projects, and TDM ordinances that continue to be implemented by local agencies constitute a broad base effort to reduce reliance on the single occupant vehicle and address CMP objectives.

### **CAPITAL IMPROVEMENT PROGRAM (CIP):**

To comply with the statutes, the 2011 CIP incorporates all CMP System projects listed in the most recent TIP including STIP, Measure "A", Transportation Uniform Mitigation Fee (TUMF), and other federally funded projects. If a CMP facility is identified as being deficient, but has an improvement project already identified, there is no need to prepare a deficiency plan.

### **CMP DEVELOPMENT AND IMPLEMENTATION PROCESS**

The CMP includes a process that addresses each of the activities identified above including CMP development, adoption, and update.

It should be noted the California Environmental Quality Act (CEQA) identifies the CMP as an exempt project. As a result, compliance with CEQA requirements (i.e. an environmental analysis) is not required.

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