


**TRAFFIC OPERATIONS POLICY DIRECTIVE**

R-001 (REV 8/2021)

<b>TRAFFIC OPERATIONS POLICY DIRECTIVE</b>	NUMBER: <b>22 - 01</b>	PAGE: 1 of 4
JASVINDERJIT S. BHULLAR, DIVISION CHIEF (Signature) 	DATE ISSUED: January 3, 2022	EFFECTIVE DATE: January 3, 2022
SUBJECT: <b>Adaptive Traffic Signal Control Technology (ATSC) at Signalized Intersections on the State Highway System (SHS)</b>	DISTRIBUTION <input checked="" type="checkbox"/> All District Directors <input checked="" type="checkbox"/> All Deputy District Directors - Traffic Operations <input type="checkbox"/> Chief Counsel, Legal Division Headquarters Division/Program Chiefs for: <input type="checkbox"/> Construction <input type="checkbox"/> Design <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Safety Programs <input type="checkbox"/> Transportation Planning <input type="checkbox"/> Additional:	
DOES THIS DIRECTIVE AFFECT OR SUPERSEDE ANOTHER DOCUMENT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, DESCRIBE	
WILL THIS DIRECTIVE BE INCORPORATED IN A DEPARTMENT MANUAL, GUIDELINE OR STANDARD PLAN? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	IF YES, DESCRIBE Traffic Signal Operations Manual	

**DIRECTIVE**

**Districts shall use adaptive traffic signal control methods in conjunction with the California Department of Transportation (Caltrans) approved central system management software to improve the performance and management of traffic signals.**

**TRAFFIC OPERATIONS POLICY DIRECTIVE****IMPLEMENTATION**

- **Caltrans central systems management software (e.g., Caltrans Advanced Transportation Management Software (CATMS), Traffic Signal Management and Surveillance System (TSMSS)) shall be configured with modules and interfaces to enable adaptive traffic signal control functions once adaptive traffic signal control methods and Caltrans-approved central system management software(s) are implemented statewide.**
- **Districts shall regularly evaluate the need for adaptive signal control at each state operated traffic signal not under control of adaptive signal control.**
- **Deployment of adaptive traffic signal control shall be continually monitored and not degrade State Highway System operational performance and safety for all roadway users.**
- Traffic signals under adaptive control may be configured to operate in non-adaptive mode when and where detection is insufficient, communication is not available, or emergency and incident management is required.
- **Adaptive traffic signal control software deployed at state operated traffic signals shall be licensed to Caltrans.**
- **Adaptive traffic signal methods for state operated traffic signals shall be compatible with the Caltrans Traffic Signal Control Program (CTSCP).**
- **State operated traffic signals shall use the Caltrans Traffic Signal Control Program (CTSCP) maintained by Caltrans Headquarters that runs on the Model 2070 controller platform.**
- Districts should partner with local agencies to delegate operations for traffic signal locations that are proposed to be under the control of a local agency adaptive traffic signal module.
- **Exceptions to usage of central systems management software and CTSCP at state-operated traffic signals shall be authorized by the Headquarters Division Chief of Traffic Operations, or designee, when districts are partnering with agencies to provide regionalized solutions.**

**DELEGATION**

No new delegations of authority are created under this policy.

**BACKGROUND**

Adaptive signal control is the process of continual optimization of traffic signal timings along a contiguous set of signalized intersections. The concept of adaptive traffic signal control is to continuously distribute green time equitably for all traffic movements by progressively moving vehicles through green lights to create smoother traffic flow through constant monitoring and updating. This optimization is usually performed through a software module or “plug-in” for a larger centralized arterial management system using one or more adaptive algorithms to calculate timing adjustments for participating intersections based on vehicle detection data. Participating intersections are controlled by standard cabinet-installed traffic controllers running embedded traffic control programs (e.g. CTSCP) that have been augmented to accept adaptive traffic control feedback. Adaptive traffic signal control has been available for over three decades.

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**TRAFFIC OPERATIONS POLICY DIRECTIVE****BACKGROUND (Cont'd)**

Sydney Coordinated Adaptive Traffic System (SCATS) and Split Cycle Offset Optimization Technique (SCOOT) were pioneers of adaptive traffic control systems. Since the inception of adaptive traffic control, academia and the transportation industry have developed numerous versions of adaptive traffic control strategies such as Utopia, RHODES, OPAC, TUC, LA ATCS, MOTION, Balance, InSync, Synchron Green, Kadence, ACDSS, and ACS-Lite.

Despite the long history and due to the complexities and costs outweighing the benefits, adaptive traffic signal control implementation has not been ubiquitous. Even with these systems, less than 1 percent of the 272,000 traffic signals in the United States are operating under adaptive control according to the Federal Highway Administration's Every Day Counts (EDC) adaptive control technology initiative. The application of any traffic control strategy, including the adaptive system, is very site-specific. It is important to understand that adaptive systems are not suitable for every signalized intersection.

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**TRAFFIC OPERATIONS POLICY DIRECTIVE****DEFINITIONS**

When used in this Traffic Operations Policy Directive, the text shall be defined as follows:

- 1) **Standard** – a statement of required, mandatory or specifically prohibited practice. All standards text appears in **bold** type. The verb **shall** is typically used. Standards are sometimes modified by Options.
  - 2) Guidance – a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements text appears in underline type. The verb should is typically used. Guidance statements are sometimes modified by Options.
  - 3) Option – a statement of practice that is a permissive condition and carries no requirement or recommendation. Options may contain allowable modifications to a Standard or Guidance. All Option statements text appears in normal type. The verb may is typically used.
  - 4) Support – an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements text appears in normal type. The verbs shall, should and may are not used in Support statements.
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