

POSITION DUTY STATEMENT

PM-0924 (REV 01/2022)

CLASSIFICATION TITLE Transportation Engineer (Elect)	OFFICE/BRANCH/SECTION District 7/Traffic Operations/TMS	
WORKING TITLE Traffic Signal Engineer	POSITION NUMBER 907-351-3609-600	REVISION DATE 11/15/2023

As a valued member of the Caltrans leadership team, you make it possible for the Department to provide a safe and reliable transportation network that serves all people and respects the environment.

GENERAL STATEMENT:

The Division of Traffic Operations manages the flow of people, goods, and information through a variety of system management strategies that utilize Transportation Management Systems (TMS) assets positioned across the California State Highway System (SHS). Under the general supervision of a Senior Transportation Electrical Engineer (Supervisor), the Transportation Engineer (Electrical) takes proactive steps and ownership to implement technology-based, traffic electrical solutions that fulfill the Department's mission and Division's objectives in improving the connectivity across SHS while achieving a more safe, reliable, equitable, complete, sustainable and efficient transportation network for all. The incumbent performs field and office work focused on traffic signals and ramp meter signals as needed; reviews District's signalized intersections and prepare monthly Leading Pedestrian Interval (LPI) implementation reports.

Appointment to Range D requires a valid Professional Engineering License (Electrical) issued by the California Board of Registration for Professional Engineers.

CORE COMPETENCIES:

As a Transportation Engineer (Elect), the incumbent is expected to become proficient in the following competencies as described below in order to successfully perform the essential functions of the job, while adhering to and promoting the Department's Mission, Vision, Values, Strategic Imperatives and Goals. Effective development of the identified Core Competencies fosters the advancement of the following Leadership Competencies: Change Commitment, Risk Appetite, Self-Development/Growth, Conflict Management, Relationship Building, Organizational Awareness, Communication, Strategic Perspective, and Results Driven.

- **Managing Change:** Demonstrating support for organizational changes needed to improve the department's effectiveness; supporting, initiating, sponsoring and implementing change. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Decision Making:** Makes critical and timely decisions. Takes charge. Supports appropriate risk. Makes challenging and appropriate decisions. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Continuous Professional Development:** Seeks to obtain knowledge and improve performance while supporting others in doing the same. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Problem-solving and Decision-making :** Identifies problems and uses logical analysis to find information, understand causes, and evaluate and select or recommend best possible courses of action. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Teamwork/Partnership:** Develops, maintains, and strengthens partnerships with others inside or outside of the organization through effective communication and collaboration. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Organizational Awareness:** Contributes to the organization by understanding and aligning actions with the organization's strategic plan, including the mission, vision, goals, core functions, and values. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Communication:** Expresses oneself clearly in all forms of communication. Gives feedback and is receptive to feedback received. Knows that listening is essential. Keeps others in the Division and other functional units informed as appropriate. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Analytical Skills:** Approaches problems using a logical, systematic, and sequential approach. Weighs priorities and recognizes underlying issues. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Commitment/Results Oriented:** Dedicated to public service and strives for excellence and customer satisfaction. Ensures results in their organization. (Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)

TYPICAL DUTIES:

Percentage	Job Description
Essential (E)/Marginal (M) ¹	

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35%	E	<p>SIGNAL OPERATIONS: Implement field configuration of traffic signal controllers. Review traffic signal intersection layout and configuration. Review operation of signalized intersections for efficiency, capacity and safety including integration with ramp/meter signals when applicable. Upgrade timing as necessary as traffic patterns change at each intersection. Take traffic counts, conduct intersection signal Level of Service (LOS) and delay studies and make recommendations for improvements as necessary. Review District's signalized intersections and prepare monthly Leading Pedestrian Interval (LPI) implementation reports. Maintain documentation of signal configuration sheet at both the intersections and in the office. Maintain and update the District's and Headquarters' traffic signal database. Provide engineering support for Traffic Signal deployment, guidance, management, tracking to District Signal Operations. Report performance metrics to District management and Headquarters.</p> <p>Conducts surveillance, analyzes data, makes real time adjustments; coordinates signal asset management, performs and documents asset operational and technical modifications; coordinates the development, design and operations of traffic signals and control devices; delivers engineering support in various phases of project development and encroachment permit processes. reviews plans, specifications and estimates, shop drawings, signal timing diagrams and Synchro files and reports.</p>
20%	E	<p>SIGNAL COORDINATION: Conduct traffic counts, develop coordination plans and time-space diagrams for new and existing coordinated systems. Implement, adjust and document coordination timing. Review traffic signal intersection layout and configurations to improve the effects on traffic signal coordination. As needed, assist with the operations of traffic signals, ramp meter/signals and other traffic control devices ensuring proper timing and configuration for efficiency and safely.</p>
15%	E	<p>LIAISON: Maintain contact and collaborates with counterparts in Maintenance, Design, local agencies, Public Affairs and the general public on signal-related issues. Attend various project meetings, coordinate with district engineers and local agencies on Delegation Agreements involving LPI implementation. Coordinate with cities, local and regional agencies in the development of master plans, policies, TMS performance management systems, life cycle analysis, automated and connected vehicles. Collaborate with headquarters, cities, local, regional and state agencies in the development of master plans, policies, TMS performance management systems, life cycle analysis, automated and connected vehicles.</p>
10%	E	<p>NEW SIGNALS: Provide engineering support to other Caltrans Divisions and Functional Units such as Construction, Design, Maintenance and Program Project Management. Represent traffic signal unit in Project Development Team (PDT) meetings. Prepare, test, install new signal timing, and turn-on new signals. Setup the Conflict Monitor's diode board and other parameters for correct operation. Perform functional test of all traffic signal systems before turn-on and initiate turn-on of the traffic signal if all systems are found satisfactory. Responsible to see that all signing and striping is in place before signal turn-on is accomplished. Employee works with Construction and Maintenance counterparts along with vendors and contractors to set up detours during construction.</p>
10%	E	<p>DATA INTEGRITY: Manage TMS Inventory Database requirements including tracking/reporting LPI implementation. Provide monthly LPI district progress reports. Coordinate with district engineers to validate database metrics.</p>
10%	M	<p>Provide remote support and travel as needed, related to above responsibilities, participate in field reviews, investigations, monitor traffic problems, and provide training. Keeps abreast of local, statewide and national progress, trends, practices in the fields of traffic signal. Undertakes special tasks and studies related to these disciplines.</p>

¹ESSENTIAL FUNCTIONS are the core duties of the position that cannot be reassigned.

MARGINAL FUNCTIONS are the minor tasks of the position that can be assigned to others.

SUPERVISION OR GUIDANCE EXERCISED OVER OTHERS

None. The incumbent does not supervise but may function as lead to provide technical direction for technicians, electrical engineers and student assistants as the need arises. May act as the Branch Chief in a non-personnel capacity when required.

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KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

The incumbent adds value to the team with knowledge of:

- Regulations and codes, plans, specifications, standards, and field practices governing the requirements for installation of ITS components, traffic signal control equipment, and construction for field elements.
- Department's policies for purchasing equipment.
- The State and Federal standards and regulations as they apply to Traffic Control Equipment including the CAMUTCD.
- California rules and regulations regarding contract management.
- Technical skills in computer engineering, software engineering, software development, software design, data analytics, and artificial intelligence.
- Traffic engineering principles and practices related to LPI, and must have ability to assist in the preparation and review of reports, plans and specifications. Incumbent must have knowledge of computer operations and electrical and electronics theory and principles, material and components of a traffic signal system, construction methods for the installation of a complete traffic signal system, and lighting and communication circuits.
- Experience in the Model 2070 traffic signal controller and various traffic signal optimization and coordination computer software.
- Review complex traffic signal plans to ensure they are correct and complete, conduct traffic counts, analyze data and make recommendations for improvements. Incumbent must have ability to observe traffic signal and ramp metering operation, recognize traffic patterns and act on observations to enhance the operation and/or safety of the intersection, observe the operation of a traffic signal and make adjustments when necessary.
- Operational/safety review of a traffic signal or ramp metering system and recommend a course of action to improve the operation or safety of the intersection, troubleshoot a signal malfunction and repair as necessary. Incumbent must be able to carry out verbal and written instructions, give verbal directions and work with others. Incumbent must be familiar with state and local road system in the District.
- Respond and resolve public inquiries in a timely manner.

The incumbent must have the ability to:

- Work effectively either independently, or with others as an interdisciplinary team member both in person and in virtual setting
- Use Microsoft Word, Excel, Access, Project and Visio software applications.
- Communicate effectively both orally and in writing with industry representatives or management personnel, participate in public presentations, and solicit outside expertise when required.
- Exhibit a high degree of technical expertise in order to gain the support and confidence of both management and industry professionals.
- Produce quality documentation and flow diagrams.
- Apply logic, education and job experience to develop proposals, research and obtain solutions, recognize erroneous data, and review and comment on the work of other technical professionals.
- Provides technical and software support for the Traffic Signal Control Program (TSCP) and Traffic Responsive Field Master (TRFM) for the Model 2070 Controllers.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

The incumbent is responsible for the reliability and accuracy of all actions, decisions, and recommendations in his/her capacity. Effective communication, proper use of equipment, correct methods analysis, and timely meeting of all deadlines are the responsibility of the incumbent. Errors may lead to the delay in schedules which may adversely affect the outcome of project delivery and increase in cost of solutions to critical problems as well as adversely affect the payback for expended efforts of team members and the loss of opportunities to make California roadways safe and efficient. Lack of sensible decisions could lead to use of defective equipment, contract completion delays, lawsuits for damages, late or unauthorized payments, costly complaints, and failure to secure funding for purchased products.

PUBLIC AND INTERNAL CONTACTS

Incumbent will assist or represent the supervisor and/or the lead person at meetings within Caltrans and/or with other agencies. As a highly visible member of Caltrans, incumbent will have frequent contacts, in both verbal and written forms, with other Caltrans personnel, cities, counties, and other public agencies, and the general public. Incumbent also provides information on traffic signals and traffic signal and ramp metering timing to and when requested by Legal Office.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

The incumbent must be able to interact cooperatively with many people, deal effectively with pressure; multi-task; adapt to changing priorities; maintain focus and intensity; remain optimistic and persistent even under adversity. Must be receptive to change and new information; adapt behavior and work methods in response to new information; changing conditions or

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unexpected obstacles; adjust rapidly to new situations warranting attention and resolution. Must be prepared to meet deadlines and complete assignments on time and occasionally under pressure. Must be available for occasional travel to various locations throughout California and perform fieldwork, observations, measurements, and studies.

The incumbent must be able to maintain a professional work ethic while communicating and coordinating with others under all conditions. Must behave in a fair and ethical manner toward others, demonstrate a sense of responsibility and commitment to public service, and value cultural diversity and individual differences in the workforce.

The incumbent needs to be comfortable fielding large numbers of inquiries for information and to respond immediately with assistance in solving problems. The employee needs to be able to work with others on projects and deliver results by deadlines. The incumbent needs to work effectively under pressure of imminent due dates and persistent tasks.

WORK ENVIRONMENT

Incumbent will be generally required to travel and conduct field reviews outdoors and may be exposed to dirt, noise, uneven surfaces and extreme heat or cold. The incumbent may perform assignments in a climate-controlled office under artificial lighting.

This position may be eligible for telework. The amount of telework is at the discretion of the Department and based on Caltrans's evolving telework policy. Caltrans supports telework, recognizing that in-person attendance may be required based on operational needs. Employees are expected to be able to report to their worksites with minimum notification if an urgent need arises. The selected candidate will be required to commute to the headquartered location as needed to meet operational needs. Business travel may be required, and reimbursement considers an employee's designated headquartered location, primary residence, and may be subject to CalHR regulations or applicable bargaining unit contract provisions. All commute expenses to the headquartered location will be the responsibility of the selected candidate.

I have read, understand and can perform the duties listed above. (If you believe you may require reasonable accommodation, please discuss this with your hiring supervisor. If you are unsure whether you require reasonable accommodation, inform the hiring supervisor who will discuss your concerns with the Reasonable Accommodation Coordinator.)

 EMPLOYEE (Print)

 EMPLOYEE (Signature)

 DATE

I have discussed the duties with, and provided a copy of this duty statement to the employee named above.

 SUPERVISOR (Print)

 SUPERVISOR (Signature)

 DATE
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