

POSITION DUTY STATEMENT

DOT PM-0924 (REV 01/2025)

CLASSIFICATION TITLE Transportation Engineer (Elect)	OFFICE/BRANCH/SECTION District 11/Traffic Safety & Ops-Transportation Mgmt Center	
WORKING TITLE Transportation Maintenance Engineer	POSITION NUMBER 911-350-3609-918	REVISION DATE 10/07/2025

As a valued member of the Caltrans team, you make it possible to improve lives and communities through transportation.

GENERAL STATEMENT:

Under the direction of the Senior Transportation Electrical Engineer, Caltrans (Branch Chief of the Traffic Maintenance Engineering (TME) & Intelligence Transportation Systems (ITS) Maintenance Support), the Transportation Engineer, Electrical (Transportation Maintenance Engineer) performs a wide variety of professional electrical and electronic engineering work to support the Traffic Safety & Operations Division-Transportation Management Center. The incumbent develops and reviews Plans, Specifications, and Estimates (PS&E), provides construction and contract support, troubleshoots system issues, maintains Electrical Systems (ES), Intelligent Transportation Systems (ITS), Transportation Management Systems (TMS), and other emerging technologies, and do other related work.

As the incumbent progresses in experience, assignments are more complex and may function as a lead person over the activities of various electrical and electronic engineering and technical personnel.

Appointment to Range D requires possession of a valid certificate of registration as an electrical engineer issued by the California State Board of Registration for Professional Engineers and Land Surveyors.

Appointment to this position requires passing the Department of Justice (DOJ) background check.

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.

- **Creativity and Innovation:** Thinks beyond the confines of traditional models to recognize opportunities, seek creative solutions and take intelligent risks. (Safety - Collaboration, Innovation)
- **Dealing with Ambiguity (Risk):** Can comfortably handle risk and uncertainty, as well as make decisions to act without having the total picture. (Employee Excellence - Innovation, Stewardship)
- **Initiative:** Ability to identify what needs to be done and doing it before being asked or required by the situation. Seeks out others involved in a situation to learn their perspectives. (Equity - Collaboration, Innovation, 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. (Safety - Collaboration, Innovation, Pride)
- **Teamwork and Collaboration:** Sets team structure. Organizes, leads, and facilitates team activities. Promotes team cooperation and encourages participation. Capable of cross functionality and working well with others on a team to achieve personal goals, team goals, and organizational goals. Takes responsibility for individual actions in order to achieve consistent results. (Safety - Collaboration, Integrity)
- **Customer Focus:** Considers, prioritizes, and takes action on the needs of both internal and external customers. (Equity, Prosperity - Collaboration, Equity, People First)
- **Interpersonal Effectiveness :** Effectively and appropriately interacts and communicates with others to build positive, constructive, professional relationships. Tailors communication style based on the audience. Provides and is receptive to feedback. (Safety, Employee Excellence - Collaboration, People First, Pride)
- **Forward Thinking:** Anticipates the implications and consequences of situations and takes appropriate actions to be prepared for possible contingencies. Anticipates and prepares for future developments. (Safety, Climate Action - Innovation, People First, Stewardship)
- **Diagnostic Information Gathering:** Identify information needed to clarify a situation, seeking that information from appropriate sources. (Safety, Equity - Collaboration, Innovation, People First, Stewardship)

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TYPICAL DUTIES:

Percentage Essential (E)/Marginal (M) ¹	Job Description
35% E	<p>PROJECT DEVELOPMENT</p> <p>Prepares electrical and electronic PS&E for ES, TMS, ITS, and other related projects using Computer-Aided Design and Drafting (CADD) software and applicable engineering standards to ensure accurate, timely, and compliant project delivery. Prepares specification for electrical systems and materials in accordance with Caltrans and industry standards to ensure consistency and quality of projects. Analyzes engineering data, circuit diagrams, drawings, and specifications to solve design, construction, and operational problems. Anticipates and analyzes potential issues in design and takes preventive action to minimize risk. Performs cost estimating and calculates Highway Maintenance-4 (HM-4) project funding requirements for both construction capital and project support phases to ensure adequate budgeting and resource allocation. Writes technical reports, correspondence, meeting minutes, white papers, and project proposals to document design decisions, communicate with stakeholders, and support project delivery. Conducts site visits and thorough field reviews to verify existing conditions, gather data, and confirm project requirements to ensure design accuracy and implementation. Monitors changes in industry codes, standards, and regulations to ensure compliance in all engineering deliverables. Stays current with developments in electrical and electronic engineering, particularly related to transportation and traffic management technologies by attending training, workshops, and professional development activities to enhance technical expertise.</p>
30% E	<p>HM-4 TMS and ITS PROJECTS</p> <p>Acts as the subject matter expert for assigned HM-4 TMS and ITS projects and pilot projects by providing technical guidance, reviewing designs, and ensuring compliance with standards and best practices. Prepares construction contract documents, reviews consultant deliverables, and monitors contract performance to ensure adherence to project specifications. Inspects and coordinates electrical construction work to verify compliance with approved plans, specifications, and applicable codes. Collaborates with academic partners, external stakeholders, and other agencies. Monitors and collects data for pilot projects and writes conclusive reports at the end of a study. Attends training, meetings, value analysis studies, project development team meetings, and workshops. Monitors electrical asset as assigned in Electrical Asset Management program.</p>
20% E	<p>CONSTRUCTION</p> <p>Provides construction support to contractors, electrical material inspectors, and to other electrical construction inspectors by offering technical guidance, clarifying specifications, and resolving issues in the field. Develops and processes change order designs and cost estimates when modifications are required during construction to maintain project schedules and compliance. Reviews and evaluates electrical materials and equipment to ensure conformity with project specifications and quality standards. Conducts quality control inspections of newly constructed or modified electrical systems to verify compliance with specifications, codes, and operational standards. Updates and maintains various electrical asset management databases to track inventory and monitor system condition. Conducts quality assurance inspections of electrical construction activities to verify conformance with approved plans and specifications.</p>
10% E	<p>TROUBLESHOOTING</p> <p>Troubleshoots and analyzes failures in electrical and electronic systems by conducting field inspections, diagnostic testing, and root cause analysis to restore system functionality. Responds to inquiries, complaints, maintenance concerns, claims resolution and pending litigation by analyzing issues and providing technical solutions to resolve problems effectively.</p>
5% M	<p>OTHER RELATED RESPONSIBILITIES</p> <p>Provides backup support to other team members during absences to maintain continuity of operations. Performs other related duties as assigned to support the TMC.</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
This position does not supervise other staff. However, the incumbent may act as a lead person over the activities of various electrical engineers and electrical technician personnel.

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KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

KNOWLEDGE REQUIREMENTS:

- Electrical and electronic engineering principles, theory, techniques, methods, and standard practices related to the design, construction, operation, and maintenance of transportation-related electrical systems.
- Modern electrical equipment, materials, tools, and methods used in transportation electrical facilities.
- Computer theory and operation, including state-of-the-art technology (e.g., CADD, software applications, database systems, stand-alone interactive systems, project management tools).
- Electrical and electronic diagnostic and testing procedures used to identify, analyze, and resolve failures or malfunctions in traffic management systems.
- Construction methods, inspection procedures, and quality control standards applicable to electrical projects.
- Asset management principles and databases to track, monitor, and manage electrical projects.
- Mathematics and physics related to electrical engineering calculations, circuit analysis, and cost estimating.
- Occupational safety and health regulations governing the design and installation of electrical and electronic equipment, including the National Electric Code and Title 8 Industrial Relations, Electrical Safety Orders of the Division of Occupational Safety and Health, and other applicable state, federal, and industry standards codes, standards, and specifications.

ABILITY REQUIREMENTS:

- Perform electrical and electronic design work using CADD and other state-of-the-art technology.
- Make neat, accurate, and complete engineering drawings and perform calculations.
- Inspect electrical installations and construction work for conformance with approved plans, codes, specifications, and standards.
- Read, understand, and apply drawings, electrical diagrams, highway plans, and technical specifications related to transportation and traffic management-related electrical and electronic systems and installations.
- Prepare clear and concise effective reports, correspondence, documentation, and presentations.
- Establish and maintain cooperative and professional working relationships with Caltrans staff, contractors, consultants, local agencies, the public, and other stakeholders.
- Prioritize multiple assignments and meet project schedules and deadlines.
- Adapt to changes in technology, procedures, and codes.
- Communicate effectively, both verbally and in writing, with team, staff, contractors, consultants, local agencies, and the public.

ANALYTICAL REQUIREMENTS:

- Evaluate engineering solutions accurately and apply logical problem, solving techniques to recommend effective solutions.
 - Interpret and apply laws, regulations, codes, policies, and standards to ensure compliance in all engineering and construction.
 - Balance multiple, competing priorities.
 - Analyze situations accurately and take effective action.
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RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

The incumbent is responsible for making accurate design, electrical and engineering calculations, and contract documents, ensuring compliance with standards and taking effective action to resolve issues effectively. Omissions in plans and reports could lead to unnecessary change orders, claims, and project delays. Errors in judgment could result in a design of lesser quality, which could increase project construction costs or expose the Department's exposure to tort liability.

PUBLIC AND INTERNAL CONTACTS

The incumbent must maintain cooperative and professional working relationships with Caltrans staff, contractors, consultants, developers, utility companies, local agencies and officials, regulatory agencies, and the public to exchange information, resolve issues, and ensure successful project delivery.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

The incumbent uses a keyboard, mouse, and video display monitor, stays stationary for prolonged periods, and may be required to move large or cumbersome reports from one location to another, including equipment and materials that can weigh up to 50 pounds. While working in a field environment, the incumbent may be required to drive long distances and move on uneven terrain.

Mental requirements include, but are not limited to, simultaneously working on several assignments and deadlines, working within a noisy and occasionally distracting work environment, and evaluating and understanding critical calculations, data, and other material that may require long periods of mental concentration.

Emotional requirements include, but are not limited to, effective personal interaction skills and the ability to effectively deal with others in various situations, deal with situations calmly and respectfully, and maintain composure in the face of confrontation and highly charged emotional situations. The incumbent must have the emotional ability to maintain a positive, customer service-oriented attitude, resolve emotionally charged issues reasonably and diplomatically, develop and maintain cooperative working relationships with all contacts, and be receptive to change and new information.

ADA Notice

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WORK ENVIRONMENT

Work environment is both indoors and in the field. While working indoors in an office setting, the incumbent works in a climate-controlled environment with artificial lighting. Multi-floored buildings are equipped with elevators and stairs. For outdoor field work activities, the incumbent may be exposed to variable traffic conditions, dirt, dust, chemicals, loud noise, uneven surfaces, and severe weather conditions. The incumbent must be aware and comply with field safety procedures when working in the field. Travel throughout the District is required, which includes San Diego and Imperial Counties. Possession of a valid driver's license is required to operate a State-owned or leased vehicle. Working at night and overtime may be required.

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.)

I agree that by providing my electronic signature for this form, I agree to conduct business transactions by electronic means and that my electronic signature is the legal binding equivalent to my handwritten signature. I hereby agree that my electronic signature represents my execution or authentication of this form, and my intent to be bound by it.

EMPLOYEE (Print)

EMPLOYEE (Signature)	DATE
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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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