

POSITION DUTY STATEMENT

DOT PM-0924 (REV 08/2024)

CLASSIFICATION TITLE Senior Trans Electrical Engineer (Specialist)	OFFICE/BRANCH/SECTION Connected Ecosystem/Ecosystem Architecture	
WORKING TITLE Ecosystem Architect Engineer (Specialist)	POSITION NUMBER 913-350-3163-041	REVISION DATE 11/20/2024

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:

Under the general direction of the Office Chief of Connected Ecosystem, a Supervising Transportation Electrical Engineer (Supervisor), the incumbent, a Senior Transportation Electrical Engineer (Specialist) serves as the Ecosystem Architect Engineer Specialist.

The Ecosystem Architect Engineer develops standards and guidance to uniformly infuse Vehicle-to-Everything (V2X) technologies and Connected Automated Vehicle (CAV) deployment methodologies within the department's Transportation Management System (TMS) infrastructure. The incumbent develops statewide standard system architectures, topologies, and details for the design, deployment, and integration of a CAV infrastructure within the department's Operational Technology (OT) environment. The incumbent commissions statewide CAV system services and leads the acquisition of associated CAV technology components.

A valid certificate of registration as an electrical engineer issued by the California State Board of Registration for Professional Engineers is required.

CORE COMPETENCIES:

As a Senior Trans Electrical Engineer (Specialist), 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. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, 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. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Ethics and Integrity:** Demonstrated concern to be perceived as responsible, reliable, and trustworthy. Respects the confidentiality of information or concern shared by others. Honest and forthright. Conforms to accepted standards of conduct. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, 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. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, 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 First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, 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. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)

POSITION DUTY STATEMENT

DOT PM-0924 (REV 08/2024)

- **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. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Planning and Results Oriented:** Organizes and executes work to meet organizational goals and objectives while meeting quality standards, following organizational processes, and demonstrating continuous commitment. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)
- **Technical Expertise:** Depth of knowledge and skill in a technical area. (Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, Advance Equity and Livability in all Communities - Engagement, Equity, Innovation, Integrity, Pride)

TYPICAL DUTIES:

Percentage	Essential (E)/Marginal (M) ¹	Job Description
30%	E	Maintains a standard architecture with provisions for a seamless integration with Caltrans Operational Technology (OT) infrastructure including TMS field elements, Traffic Operations Systems Network (TOSNet) communications, and Traffic Management Center (TMC) central system platforms. Partner with TMC staff and Divisions of IT and Security to ensure planned IT and OT components are mainstreamed in a secure and high-performing heterogeneous environment that is fully supported. Develops system topologies and integration plans for CAV technologies to enable safety and mobility use cases for vulnerable roadway users, transit, freight, and work zones. Develops and maintains a statewide clearinghouse for proven CAV application software modules and supporting technologies to guide district deployment. Develops CAV technology software and equipment specifications. Leads and executes statewide acquisition of CAV software and hardware components in compliance with state procurement and acquisition regulations, in accordance with California Air Resource Board requirements, and aligned with the Division of Equipment's fleet equipment requirements.
25%	E	Develops enabling CAV statewide hosting services including Radio Technical Commission for Maritime (RTCM) services, Security Credential Management System (SCMS) services, GIS asset mapping services, and expand the palette of available traveler information feeds from Commercial Wholesale Web Portal 2 (CWWP2) to support the broadcast of Traveler Information Messages (TIMs) for end users of CAV applications. Coordinates with the Division of Maintenance Office of Radio Communications for the continued Federal Communications Commission (FCC) licensing of statewide CAV Road Side Units (RSUs). Performs asset management, GIS mapping, and statewide status reporting of planned and operational CAV RSU units. Develops technical training for CAV engineering practitioners to support the installation and continuous maintenance and operations of CAV technologies.
20%	E	Guides Connected and Automated Vehicle (CAV) technology development through collaborative industry outreach and active pilot projects at test beds and proving grounds. Provides technical direction in developing standards, guidance, and procedures in collaboration with district CAV practitioners. Ensure uniform standardization of CAV applications and technology with statewide committees, working groups, and other technology specialists. Reviews, coordinates, consults, and contributes to work performed by district engineers, consultants, academia, and Caltrans divisions including Division of Research, Innovation & System Information, Maintenance, Design, and others as required. Participate in national Intelligent Transportation System (ITS) standards-setting activities, American Association of State Highway and Transportation Officials (AASHTO) and Intelligent Transportation Society of America (ITSA) committees, and inter-agency working groups at the local, regional, and national levels.

POSITION DUTY STATEMENT

DOT PM-0924 (REV 08/2024)

20%	E	Develops the framework and technology adoption plans to infuse new technology to apply the Safe System Approach to traffic signals and other ITS elements. Develops strategic roadmaps to infuse connected and emerging smart technologies that improve safety on the State Highway System (SHS). Develop a TMS smart technology framework that aligns with the State Highway Safety Plan, Safety Programs Strategic Plan, and the Road Safety Action Plan to promote the safety of vulnerable roadway users and work zones focused on speed reduction, real-time hazard detection, speed data, and near-miss data. Partners with Safety Programs and the AV Industry to capture additional safety data regarding CAVs.
5%	M	Completes a variety of special projects and assignments as needed by the Division Chief, Deputy Division Chief, Division Chief, and Office Chief. Perform other work commensurate with the Senior Transportation Electrical Engineer (Specialist) classification.

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

The incumbent is expected to achieve results through others while working in a matrix organization using a multi-disciplined team. While the incumbent does not directly supervise a staff in the conventional definition, they contribute to a multi-disciplined team where various functional managers administratively supervise the individual team members. This position is a specialist and may serve as a subject matter expert on technical and functional matters.

KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

Possession of a valid certificate of registration as an electrical engineer issued by the California Board of Registration for Professional Engineers is required.

Must have knowledge of the design and preparation of plans, specifications, and estimates for highway lighting and electrical control systems; electrical and electronic theory as applied to highway lighting and electrical control systems; principles and practices of traffic engineering as they apply to highway lighting and traffic control; various codes and field practices governing the design and installation of highway lighting and traffic control equipment; basic occupational safety and health regulations contained in the Title 8 Industrial Relations, Electrical Safety Orders, safety and health policies and procedures as contained in the Department's Injury and Illness Prevention Program; materials and construction costs for highway lighting and traffic control systems; digital electronics, microprocessors, and development of strategies for traffic control; computer-based traffic management equipment; the principles of traffic engineering, traffic safety, and traffic management; highway design; traffic and construction policies, procedures, standards and other factors relating to transportation facilities; organizational and engineering functions (both within and outside of Caltrans) that pertain to design, operations, maintenance, and construction of all types of transportation facilities; factors which influence the impact of transportation facilities on the environment, the community and the economy.

Must have knowledge of transportation principles and methods and the ability to apply the national best practices at Caltrans to improve capabilities and success in meeting goals. Must have a thorough knowledge of Caltrans' organization and policies; strategic planning processes and techniques; performance measure development, implementation, and assessment; principles and practices of public administration, budgeting, personnel, planning, program management, and evaluation.

Requires the ability to collaborate with multi-disciplinary, technical staff; communicate effectively (both orally and in writing) with multiple audiences; establish and maintain cooperative relationships with individuals and organizations contacted in the course of work; participate in public contact and represent Caltrans; serve in a consulting capacity to other divisions and districts; and respond appropriately to difficult situations.

Must be able to apply sound judgment in problem solving; work productively in a busy and often changing environment; perform multiple tasks simultaneously; maintain a project schedule; accurately and timely follow-up on issues; and effectively interact with many levels of people in a cooperative manner. Must be decisive, take appropriate actions, and complete tasks or projects with a short notice. Requires proficiency with Microsoft (MS) Office programs (including MS Word, MS Excel, MS PowerPoint, MS Outlook, MS Teams), Adobe Acrobat, Cisco WebEx, and using the Internet.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

This position is responsible for making independent action and taking initiative to carry out assigned duties. The incumbent's decisions and actions have a direct impact on the Traffic Operations Program and the Department. Inability to carry out this position's responsibilities could result in: adversely affecting public safety and/or result in tort liability for Caltrans; increased

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POSITION DUTY STATEMENT

DOT PM-0924 (REV 08/2024)

expenses resulting from lost Transportation System productivity; litigation that could delay and/or add substantial cost to essential projects or activities; inability to quantify performance in meeting the Department's strategic goals and safety and mobility commitments; loss of credibility and public confidence in Caltrans as a responsible public agency.

PUBLIC AND INTERNAL CONTACTS

The incumbent must maintain the highest level of professionalism and integrity, exhibit tact and diplomacy, and effectively communicate with all internal/external contacts.

Internal contacts include various Caltrans districts and divisions (including Design, Construction, Maintenance, External Affairs, and Engineering Services). External contacts include the Legislature, Governor's Office, CHP, FHWA, construction industry representatives, local agencies, other states, national experts, academia, the private sector, and the general public.

The incumbent must communicate effectively orally and in writing, by telephone, via email, and by web conferencing. The incumbent is also required to facilitate, participate in, and host meetings.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

The incumbent must: quickly adapt behavior and work methods in response to new information/priorities and unexpected obstacles; multi-task; effectively interact with many levels of people in a cooperative manner; be decisive; take appropriate actions; and complete tasks or projects with a short notice. Must be able to maintain focus and intensity, yet remain optimistic and persistent, even under adversity. The incumbent shall act in a fair and ethical manner toward others; value cultural diversity and other individual differences in the workforce; and demonstrate a sense of responsibility and commitment to public services. The incumbent must be able to develop new insights into situations and apply innovative solutions to make organizational improvements; grasp the essence of new information and master new technical and business knowledge, particularly in the area of outreach; and facilitate and maintain a work environment that encourages creative thinking and innovation.

Must have the ability to work with a computer and have manual dexterity. Required to sit for long periods of time using a computer, monitors, phone, and other office equipment. The incumbent must be able to occasionally lift up to 25 pounds without assistance. Bending, stooping, and pulling may be required within the normal course of performing some of the responsibilities associated with this position. May be required to speak in front of large groups.

WORK ENVIRONMENT

This position's headquartered location is Sacramento, CA. While at the base of operation, the incumbent works in a climate-controlled office under natural and artificial lighting. Due to periodic issues with heating and air conditioning, building temperatures may fluctuate. Multi-floor buildings are equipped with elevators and stairs.

The incumbent may be required to travel periodically to other office buildings (federal and state offices, district offices, local agencies, etc.) and indoor/outdoor field locations. While at field locations, the incumbent may be exposed to uneven surfaces, noise, and varying climate conditions. The incumbent may be required to travel within the state and may be required to travel out-of-state for business operations. Possession of a valid driver's license is required to operate a State owned, leased, and/or personal vehicle. The environment is fast-paced, demanding, and busy; and requires considerable flexibility in managing time, priorities and assignments. Vacations may be restricted during peak times.

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.

POSITION DUTY STATEMENT

DOT PM-0924 (REV 08/2024)

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

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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