

**POSITION DUTY STATEMENT**

PM-0924 (REV 9/2013)

CLASSIFICATION TITLE Transportation Engineer, Electrical	OFFICE/BRANCH/SECTION HQ/DRISI/Traffic Operations Research	
WORKING TITLE Transit Safety and Operations Engineer	POSITION NUMBER 913-191-3609-913	EFFECTIVE DATE May 1, 2014

As a valued member of the Caltrans team, you make it possible for the Department to improve the mobility across California by being innovative and flexible; reporting to work as scheduled; working cooperatively with team members and others; and treating others fairly, honestly and with respect. Your efforts are important to each member of the team as well as those we serve.

**GENERAL STATEMENT:**

Under the direction of the Chief, Public Transportation & Modal Research, a Senior Transportation Engineer, the incumbent is responsible for providing technical assistance to internal and external customers who manage and operate modal systems. Examples of modals systems range from transit bus or bus rapid transit (BRT) systems, rail, and airport ground access to pedestrians and bikeways. The emphasis of the technical assistance shall be in the areas of electrical and electronic systems, communications and control systems, and computer technology. As a project manager, ensures that assigned projects are completed within scope, cost, schedule, budgeted resources and departmental standards and practices. In addition, the incumbent is responsible for developing request for proposals, monitoring research contracts, providing technical assistance, and ensuring timely identification and assessment of innovative research results, technology, and other related research products. These technologies and products are developed, implemented, and promoted in partnership with other state and federal agencies, regional and local government, private industry, universities, and others in the national and international intelligent transportation systems (ITS) and general transportation research community. Incumbent will participate in field operation tests (FOTs) where necessary. Incumbent shall possess skills in ITS, electrical and electronic systems, communications and control systems, traffic engineering, benefit-cost analysis, evaluation methodology, and oral presentations. The incumbent will have significant contact with public agencies and private organizations through presentations and group meetings.

**TYPICAL DUTIES:**

Percentage		Job Description
30%	E	Develop, scope, and coordinate technical engineering research and demonstration projects involving Caltrans modal Divisions, modal systems operators, metropolitan planning organizations, university researchers, private sector businesses, and others. Tasks include preparing research proposals, monitoring research projects, investigating applications of new technologies, and performing statistical analyses of research data. Provide technical engineering assistance in the planning, design, implementation, testing, and demonstration of various ITS systems, sensor and actuator systems, hardware and software applications, and other related technologies for modal systems. Identify, develop, and evaluate new concepts to provide innovative solutions to the challenges of California's transportation system.
30%	E	Develop technical research and demonstration projects that involve a variety of electrical, electronic, and computer-based technologies and innovative solutions, such as adaptive signal systems, integrated modal communications systems, and cooperative vehicle-highway automation systems. Conduct engineering studies of electrical systems, evaluate test data, and provide technical input regarding various hardware and software designs that are commonly used to incorporate sensors and actuators in vehicle computer systems, and to integrate vehicle-to-roadside hardware and software interfaces in wayside computer systems and communications networks of modal systems. Analyze engineering test results and describe policy implications of research and deployment projects to the Division, Department, customers, and others. Specific analyses can occur in the areas of research methodology, plans, projects, schedules, and processes. Research data may apply to the evaluation, development, testing, demonstration and deployment of emerging technologies and products.
20%	E	Identify research and development trends and recommend policies to facilitate future research and development effort, including both short and long-term research strategies and the appropriate deployment planning activities. Perform feasibility evaluations by applying new technology and

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		products towards specific areas of interest within Caltrans (i.e. electronic toll paying, transit smart card use). Stay abreast of the latest advances in technology (national and international) and determine the means for evaluation for those developments with the highest potential for success. Solicit comments and suggestions from the end-user as to the validity of the new technology. Work with project managers, Office Chiefs, Division Chiefs, and other managers throughout Caltrans to ensure support for research. Contact and coordinate with university researchers (particularly at University Transportation Centers), private industry managers, and CEOs to develop long-term research roadmaps and deployment plans.
10%	E	Manage Caltrans research contracts, task orders, and in-house projects and report on the progress of research in a monthly report to the Branch Chief. Develop presentations on research progress and prepare technical briefs and reports. Provide technical and logistical staff support to the Department's Technical Advisory Panels (TAPs), the Research and Deployment Advisory Committee (RDAC), and other technical committees and panels as needed. May participate at a national level on workshops and panels for the Federal Transit Administration, the Transit Cooperative Research Program or committees of the Transportation Research Board (TRB).
5%	M	Review materials from other offices, regulations, and legislation related to new technologies and products for modal system operation and maintenance, communications systems, ITS and related areas. Develop recommendations for Department action, review and determine the impact of state and federal policies and legislation related to research deployment strategies, and formulate and present recommendations for action. Participate in the development of proposed legislation for issues related to research and its potential benefits to the transportation system.
5%	E	Prepare reports, issue papers, memos, emails and other types of technical correspondence as requested by management; and develop/deliver presentations to management. The incumbent attends management meetings during Branch Chief's absence, and performs special assignments as directed by the Office Chief or Division Chief.

<sup>1</sup>ESSENTIAL 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.

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### SUPERVISION OR GUIDANCE EXERCISED OVER OTHERS

Does not supervise others. In a lead capacity, incumbent may assign work and/or organize and evaluate the work of peers and oversee the activities of other staff.

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### KNOWLEDGE, ABILITIES AND ANALYTICAL REQUIREMENTS

The incumbent must have completed academic course work at the university level in Electrical Engineering, Mathematics, and Computer Science resulting in a B.S. Degree in Electrical, Electronics or Computer Engineering or the equivalent. The incumbent is able to perceive trends, needs and problems; integrate new discoveries into the Department's practices; and establish research directions that lead to successful solutions for the Department's problems. The incumbent has knowledge of computer theory and operation and is familiar with personal computers and their use in research. The incumbent understands plans, drawings, diagrams and specifications and field data related to electrical installations associated with transportation engineering systems and equipment. The incumbent has knowledge or experience in conducting, administering and managing research. The incumbent is knowledgeable in developing and administering projects and contracts and is familiar with the Department's purpose, mission, vision and goals.

The incumbent must possess a thorough knowledge of methods, materials and equipment used in designing, constructing, maintaining and operating transportation facilities, and should have a solid understanding of intelligent transportation systems (ITS), electronic sensors, actuators, computer hardware & software, communications systems, control systems, and current trends in computer and electronics technology. Some knowledge of transit agency operations or other related operations is desirable to facilitate effective implementations. The incumbent is able to analyze operations and suggest alternative courses of action utilizing current technology. The incumbent is familiar with the Department's various programs and policies, and possesses strong interpersonal skills to be able to communicate effectively work cooperatively with internal and external customers. The incumbent has the ability to gather, compile, analyze, and interpret technical data and communications protocols and articulate that material to a general, non-technical audience and is able to work effectively with others in the general transportation research community. The incumbent can research, analyze and make recommendations on research programs related to the engineering aspects of modal systems or on any program assignment related to ITS and Advanced Transportation Systems (ATS).

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The incumbent is able to identify, research and analyze transportation problems that can be mitigated or eliminated through the application of electronic, electrical or vehicle control technological innovations for modal systems. The course of current and future research will be, in part, shaped by the analysis and recommendations made by the incumbent.

The incumbent has the ability to think strategically, identify important variables, take effective action, reason clearly; generate and evaluate alternatives; and be able to present ideas and information effectively both verbally and in writing. Able to work independently, the incumbent exercises initiative and using good judgment in planning and organizing a complex process. The incumbent can also work effectively as a member of a team and work effectively with a wide variety of partners, including governmental agencies, the private sector, the academic community, other institutions or the general public.

In addition to technical skills, the incumbent possesses the ability to develop innovative communication techniques to present research methodologies and results effectively both orally and in writing. Also, the incumbent has the ability to gather, compile, analyze, and interpret technical data and articulate it to a general, non-technical audience. The incumbent can communicate effectively with other agencies, governments, private industry, universities, and the general transportation research community.

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### RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

The incumbent is responsible for a variety of complex research and demonstration projects, which focus on the use or proposed use of intelligent transportation systems (ITS) technologies. These projects usually involve investigation into areas where precedents are lacking or where only a sparse body of knowledge or experience exists. These projects also have large budgets and must be planned and managed properly to ensure that their products are developed and delivered in a cost-effective and timely manner. Errors and/or inappropriate actions could result in missed opportunities to improve the transportation system within California and adversely affect Caltrans ability to achieve its mission, vision and goals. Consequences could include reduced internal and external support for mobility research activities and reduced federal and State funding and local and private sector cost sharing.

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### PUBLIC AND INTERNAL CONTACTS

The incumbent has frequent contact with a large number of Division and Department managers, staff, academic personnel, consultants, other public (Federal government and other states) employees, and industry representatives. Direct contact with ITS America, Transportation Research Board, American Association of State Highway and Transportation Officials, and other state and national transportation research officials must be conducted with full regard to the direction and needs of the Department. The incumbent also meets with staff of transportation service providers, users of the transportation system, and other transportation interest groups. The incumbent provides comment and may provide testimony at public meetings and institutional forums. The incumbent may serve as the technical and analytical expert for transportation research conducted by the Division.

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### PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

While at the base of operation, the incumbent will work in a climate-controlled high-rise office building under artificial light. Working hours will be set sometime between 6:00 a.m. and 6:00 p.m.. The incumbent may be required to sit for long periods of time using a keyboard and video display terminal. Some travel may be required in conjunction with duties. 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, yet remain optimistic and persistent even under adversity; open to change and new information; adapt behavior and work methods in response to new information, changing conditions, or unexpected obstacles; complete tasks/projects within a short time frame; behave in a fair and ethical manner toward others; and demonstrate a sense of responsibility and commitment to public service. The incumbent must value cultural diversity and other individual differences in the workforce.

Incumbent must have the ability to multi-task, adapt to changes in priorities, and complete tasks or projects with short notice. Incumbent must be able to concentrate in order to review and create documents and meet strict deadlines at times. Incumbent must grasp the essence of new information and master new technical and business knowledge, particularly in the area of mobility research and related areas. Incumbent must understand new and long-range plans and be able to determine how best to position the Division to achieve a competitive advantage in transportation research.

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### WORK ENVIRONMENT

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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.)

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EMPLOYEE (Print)

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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.

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SUPERVISOR (Print)

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SUPERVISOR (Signature)

DATE

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