

## Who we are:

Transportation is so basic that many of us overlook its overwhelming importance in our daily lives. Practically everything used in our homes, offices, or schools across Tennessee – from furniture to food items to clothing – requires a large and complex transportation network. The Tennessee Department of Transportation provides citizens of Tennessee and travelers with one of the best transportation systems in the country. TDOT is a multimodal agency with responsibilities in building and maintaining roads, aviation, public transit, waterways, railroads, cycling and walking. Our involvement ranges from airport improvements to funding transit buses to planning for river ports. The Department of Transportation has approximately 3,500 employees with four statewide region facilities in Knoxville, Chattanooga, Nashville, and Jackson.



### **ITS Laboratory Products Transportation Engineer**

Traffic Operations Division – TSMO Section

Nashville, TN

\$99,348 annually

#### **Job Overview**

The Intelligent Transportation Systems (ITS) Laboratory Products Transportation Engineer will work in a team setting that provides engineering support and expertise to the Transportation Systems Management and Operations (TSMO) Section. This position collaborates with Project Teams by identifying potential ITS materials, equipment, and product challenges and implementing statewide acquired knowledge to ensure quality deliverables, minimize inconsistency, and increase the safety and performance of Tennessee's transportation system. This position will also assist with planning and implementing the TSMO Section's performance metrics and plans, schedules and budgets, development of various technical reports, and assurance of continuity and consistency statewide.

The ITS Lab Products Transportation Engineer ensures Department policies, technical guidance, and procedures are incorporated into ITS Lab deliverables. This position will be involved in overseeing Quality Assurance and Quality Control of the ITS Lab programs and the implementation of best practices at HQ and in the Regions. This position will assist the ITS Deployment Team Lead and the TSMO Manager with implementing statewide work plans, meeting the Section's strategic vision, and ensuring compliance with Federal and State laws and requirements pertaining to ITS materials, equipment, and products. The ITS Lab Transportation Engineer will research national best practices to drive innovation and efficiency within each team setting as part of the TSMO Section. This position must effectively articulate technical engineering concepts through training, mentoring, and collaborating as part of a matrix organization.

#### **Essential Job Responsibilities**

Maintain awareness and foundational knowledge of traffic engineering studies and analyses, safety studies, incident crash reports, traffic data, congestion mitigation studies, and other technical engineering reports. Provide data-driven decisions that improve safety and resiliency of ITS assets statewide. Strengthen the TSMO teams by providing technical engineering expertise and support in matters related to complex and/or unique ITS materials, equipment, and product-related challenges to allow the TSMO Section and Regional staff to perform their roles effectively and efficiently, optimizing the Team's ability to address unanticipated challenges successfully. Assist in the development and maintenance of corridor performance metrics that identify real-time congestion locations and the cause of recurring congestion, bottlenecks, incidents, work zones, weather events, and other operational deficiencies.

Assist in the development of Consultant Acquisition Plans (CAP) for ITS Lab services and assist in the oversight of external partners by serving on technical review committees, including assisting with Request For Proposal (RFP) development, attending project-specific marketing meetings, assisting with determining scoring criteria, assisting with project information sessions when applicable, serving as a scorer as part of the consultant acquisition process, and attending de-briefs for consultants where usable feedback must be provided. Review consultant projects having a high degree of risk to the Department for compliance with TDOT's policies and procedures for ITS Lab.

Ensure compliance with the Quality Management policy related to ITS Lab elements to minimize plan errors, rework, permit and right-of-way delays, construction delays, and contractor claims. Support the Quality Teams by conducting reviews according to the Project Development Network (PDN) and TDOT's Quality Assurance Program, identifying potential operational and constructability concerns in proposed designs, and collaborating with other technical disciplines to recommend proactive solutions that meet project needs.

Assist Project Teams within a matrix organization by providing ITS Lab expertise; define expectations for how Project Teams manage risk; assist in the development of the project vision in alignment with Asset Management; support the definition of critical goals and intended outcomes for scope, schedule, and quality in coordination with the Project Manager for ITS Lab elements; and participate in Risk Management Assessments. Assist Project Management staff with ITS Lab Scope of Work in collaboration with TDOT Environment, Permits and Right-of-Way, Roadway, Maintenance, and Construction teams. Assist with applying multi-modal, context-sensitive freeway modeling and methodologies. Coordinate effectively with other technical disciplines within TDOT to address potential ITS Lab elements as part of the Functional Design Plan development according to the PDN. When applicable, support approvals related to ITS design materials, equipment, products, and deliverables. Additionally, assist with proactively assessing risk factors related to ITS Lab elements, including legal aspects, public relations, and safety considerations.

Provide exceptional customer service to both internal and external customers, including mentoring and providing technical guidance related to ITS materials, equipment, and products; coordinating with other disciplines as part of a matrix organization, exercising effective listening skills, providing prompt responses, maintaining complete and accurate documentation, and communicating effectively. Provide input to the Asset Management Division Data Systems Manager regarding ITS Lab performance measures and accomplishments.

Work with emerging technology engineers in other work groups such as Traffic Design Division in a matrix organization to research emerging ITS technologies for potential integration into the TDOT ITS network. Develop and bench-test prototypes of new ITS materials, equipment, products, and software in a controlled environment before field deployment. Work with region and Information Technology (IT) stakeholders to conduct rigorous testing on devices like traffic sensors, signal controllers, connected vehicle hardware, communication equipment, etc. to ensure functionality, reliability, and compliance with standards. Create and execute test plans—including hardware-in-the-loop and software-in-the-loop testing—to simulate real-world conditions and recommend improvements for deployment readiness. Provide data-driven insights to guide ITS investments, collaborate with industry and academia on the latest advancements, and confirm interoperability and compliance with standards such as NTCIP (National Transportation Communications for ITS Protocol), Institute of Electrical and Electronic Engineers (IEEE), and Society of Automotive Engineers (SAE).

Oversee the setup, maintenance, and calibration of laboratory equipment and ITS test platforms. Manage the inventory of laboratory resources, including hardware, software, and tools necessary for testing and simulation. Establish and enforce safety protocols and best practices for laboratory operations. Develop detailed technical documentation, including testing procedures and reports, system specifications, and validation protocols, for ITS systems evaluated. Integrate approved ITS materials and products in the TDOT Qualified Products List (QPL). Work with HQ Construction and IT to investigate the transition for QPL to an Approved Product List (APL). Maintain a database of test results, findings, and historical performance data to support ongoing research and system

improvements. Propose and implement certification methods and testing procedure improvements to maintain the laboratory as a cutting-edge facility for TDOT's ITS evaluation and innovation.

Work with a variety of stakeholders including region staff and IT, ensure seamless interoperability across ITS technologies, platforms, and software and develop integration strategies with local, regional, and federal partners and assist with communications infrastructure like fiber optics and wireless networks for real-time operations. Collaborate with IT specialists to establish reliable data transmission between field devices and Transportation Management Centers (TMCs), troubleshooting to maintain consistent, secure, and accurate data flow. Collaborate with IT specialist to ensure cybersecurity and compatibility with legacy systems while minimizing disruptions. Participate in contractor ITS site systems burn-in testing as needed to confirm new systems function within the ITS architecture and continuously monitor performance, coordinating maintenance, inspections, and updates as needed.

Collaborate with the TDOT Technical Training Director and assist in the development of training that addresses acquired knowledge, including technical elements and emerging technologies related to ITS Lab testing for the purpose of improving team performance, creating a stronger understanding of ITS Lab elements as they relate to the transportation industry, inspiring new ideas, and developing skills.

Assist in ensuring ITS Lab deliverables are consistent, predictable, and repeatable to maintain consistently high levels of achievement, mitigate risk, and establish a history of success by implementing statewide policy, data collection, processing standards, specifications, and direction. Utilize best practices and TDOT policy for the incorporation of ITS Lab elements, including access to acquired knowledge across the Regions.

### **Qualifications**

- Bachelor's Degree in Engineering
- Licensed Professional Engineer (PE)
- 4 years of demonstrated competency in developing and/or constructing traffic operations transportation projects

### **Ideal Candidate**

The ITS Lab Transportation Engineer is an expert in all aspects of ITS Lab testing and approvals. They possess strong attention to detail and are committed to improving safety and performance of ITS Assets. With a wealth of technical expertise, they offer unique solutions to ITS Lab challenges. The ITS Lab Transportation Engineer's analytical skills allow them to predict and prevent issues before they become problematic, ensuring ITS materials, equipment, and product sustainability and performance that improves safety and travel reliability. They possess excellent communication and collaboration skills, which enable them to effectively communicate complex technical information with stakeholders at all levels.