

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. TDOT Aeronautics is located near the John C. Tune Airport in Nashville, TN.



Hydraulics Transportation Engineering Specialist 3 & 4

Region Preconstruction – Roadway Design

\$80,784 - \$88,860 annually

Job Overview

The Hydraulics Transportation Engineering Specialist 3 & 4 supports Project Teams, technical Divisions, and Region Operations by applying Department specifications, policies, technical guidance, and procedures to the assessment and design of hydraulic systems, drainage infrastructure, stormwater management and flood risk mitigation for TDOT's transportation infrastructure. This position collaborates with technical disciplines and Project Teams to prioritize safety and the effective management of hydraulic design elements in support of TDOT's project delivery process and Region Operations.

The Hydraulics Transportation Engineering Specialist 3 & 4 continuously evaluates performance indicators to implement acquired knowledge into the design of hydraulic elements, mitigating the Department's risk and increasing performance as part of fulfilling TDOT's strategic vision.

The Hydraulics Transportation Engineering Specialist 3 & 4 collaborates with internal stakeholders, including Project Teams, TDOT Divisions, and Regions, to facilitate the transformation of critical hydraulic elements into a design solution that aligns with the goals of the Asset Management Division. This position must effectively articulate hydraulics concepts through training, mentoring, collaborating, and on-site meetings with property owners.

Essential Job Responsibilities of the Transportation Engineering Specialist 3 and 4 include:

Strengthen Region Operations by assisting with permit reviews to control the transfer of stormwater into the Department's right of way (ROW) and to prevent any unreasonable burden on adjacent and downstream properties resulting from the development and/or redevelopment of additional transportation infrastructure within the Department's ROW and/or properties abutting the Department's ROW, including existing drainage infrastructure reviews, pre/post development calculations, and connections to closed and/or open TDOT drainage conveyance systems.

Serve on Project Teams by applying the Project Delivery Network (PDN) to define the scope of work related to hydraulic design elements; complete hydraulic analyses, drainage design, and all hydraulic-related deliverables for flows less than 500 cfs through all Stages of the PDN process and in alignment with the project's scope, schedule, and budget; and ensure all pay items and associated costs for hydraulic infrastructure are accurately accounted for in the project estimate.

Integrate Quality Management into all deliverables for the purpose of proactively addressing plan errors and minimizing contractor claims. Address and resolve all comments obtained from Quality Control reviews.

Compile and organize hydraulic design documents, which may include drainage reports, hydraulic modeling outputs, plans, and cost estimates, for all quality reviews. Ensure that all required hydraulics-related deliverables align with project requirements and the PS&E checklist. Verify accuracy and completeness of documentation, incorporate necessary revisions, and coordinate any cost estimate adjustments with the Project Manager if needed.

Provide designs for hydraulic elements having flows less than 500 cfs using engineering software, including open channel flow analysis for various discharge conditions, closed stormwater drainage systems, culvert and bridge hydraulic analysis, erosion protection and sediment control measures; assess floodplain impacts and ensure proper conveyance of design flows; and coordinate with the TDOT Environment Division and Right-of-Way Division to determine project footprints and mitigate potential hydrologic and hydraulic impacts.

Assist in ensuring design decisions prioritize safety and risk mitigation by presenting context-sensitive hydraulic design concepts, implementing acquired knowledge, and incorporating innovative strategies that improve drainage performance, reduce flood risks, and enhance stormwater management. Collaborate with Project Teams to address drainage concerns, mitigate work zone impacts, and support the integration of effective hydraulic solutions into project designs.

Provide exceptional customer service to project stakeholders by facilitating the sharing of acquired knowledge with Project Teams, providing prompt assistance for hydraulics-related concerns, exercising effective listening skills, and communicating effectively. Assist Region Operations with addressing drainage concerns from property owners by implementing innovative and sustainable solutions that align with the goals of the Asset Management Division.

Remain current and engaged on hydraulic design-related elements, changes to specifications, and innovative construction practices. Research national best practices to optimize designs, methodologies, and safety considerations.

Coordinate and mitigate potential hydraulic risks with Headquarters (HQ) and Region Project Teams throughout the project delivery process. Identify potential design and construction constraints concerning the provisions listed within applicable right of way and environmental documents, when applicable. Identify potential utility conflicts with hydraulic infrastructure based on best available information. Monitor the effectiveness of implemented risk mitigation strategies and provide additional recommendations, as needed.

Additional Job Responsibilities for the Transportation Engineering Specialist 4 include:

Work with HQ Hydraulics to provide designs for hydraulic elements for bridges and structures having flows greater than 500 cfs, utilizing hydraulic modeling software such as HEC-RAS. Calculate scour using hydraulic models and calculation tools such as the FHWA Hydraulic Toolbox.

Coordinate with the TDOT Technical Training Director and assist in the development and presentation of training that addresses hydraulic design elements, including acquired knowledge, risk management, TDOT performance metrics, governing rules and processes, reporting procedures, and emerging technologies related to hydraulic design for the purpose of improving team performance, creating a stronger understanding of hydraulic systems, inspiring new ideas, and developing skills.

Assist Project Teams by evaluating complex hydraulic designs to determine potential incompatibilities with other technical discipline requirements. Break down complex issues, including the identification of causes and their cause-and-effect relationships.

Perform quality control reviews of hydraulic-related elements, focusing on proactively addressing plan errors and mitigating constructability issues. Provide recommendations, when applicable, in response to identified risks related to the proposed design. Verify the proposed design complies with the goals of Asset Management, HQ Hydraulics, the Scope of Work, applicable TDOT standards, federal and state policies and guidelines, and all other project-specific requirements.

Qualifications

The Transportation Engineering Specialist 1 and 2 are part of the Graduate Transportation Engineer (GTE) Program.

Transportation Engineering Specialist 3:

- Bachelor's Degree in Civil or Environmental Engineering
- 2 Years of demonstrated competency in hydraulic analysis and/or design for transportation-related projects

OR

- Master's Degree in Civil or Environmental Engineering
- 1 year of demonstrated competency in hydraulic analysis and/or design for transportation-related projects

Transportation Engineering Specialist 4:

- Bachelor's Degree in Civil or Environmental Engineering
- 3 years of demonstrated competency in hydraulic analysis and/or design for transportation-related projects

OR

- Master's Degree in Civil or Environmental Engineering
- 2 years of demonstrated competency in hydraulic analysis and/or design for transportation-related projects

Ideal Candidate

The Hydraulics Engineering Specialist 3 & 4 is part of a highly skilled group of engineers who play a critical role in shaping the safety, sustainability, and resilience of infrastructure. They possess a deep understanding of stormwater management, drainage systems, and flood risk mitigation, ensuring that hydraulic solutions not only meet technical and regulatory standards but also protect public health, property, and the environment. These professionals thrive in complex, interdisciplinary settings—collaborating with many teams to develop innovative and responsible water management strategies. Adaptable and analytical, they excel at solving water-related challenges that impact communities, leveraging their expertise to enhance infrastructure performance and longevity. Their ability to balance engineering precision with broader environmental and regulatory considerations makes them an invaluable asset to TDOT's mission.