

# STATE OF MONTANA

## JOB DESCRIPTION

*Montana state government is an equal opportunity employer. The State shall, upon request, provide reasonable accommodations to otherwise qualified individuals with disabilities.*

**Job Title: Data Quality Specialist**

**Position Number: 80027**

**Location: HQ**

**Department: Transportation**

**Division and Bureau: Highways & Engineering/Materials Bureau**

**Section and Unit: Pavement Analysis/Pavement Management**

**Job Overview:** This position is a Data Quality Specialist in the Pavement Management Unit of the Montana Department of Transportation Materials Bureau. This position provides technical supervision and review of road condition and inventory data for use in the Pavement Management System (PvMS). This position performs advanced engineering/technical work in the collection, analysis, interpretation, and reporting of complex pavement data. Specifically, the Data Quality Specialist is responsible for developing, coordinating, producing and analyzing pavement data using specialized software and MDT bidding/construction information. This position provides technical assistance, training, and direction to Road Profile Analyst in accordance to AASHTO standards and MDT's Data Quality Management Plan. This position reports to the Pavement Management Engineer (position 40080) and does not supervise others.

### **Essential Functions (Major Duties or Responsibilities):**

#### **Materials Research and Analysis**

**- 55%**

- Oversees and ensures the accuracy, efficiency, and overall quality of data collection and project analysis. This includes assessing data collection procedures, equipment, and results; data management system capabilities and limitations; and materials standards. Controls quality assurance practices for Automated Collection Van operators in the unit's data collection processes. The position promotes consistency through coordination with the van operators ensuring both data collection crews use identical procedures, forms and documentation for calibrations, collection and reporting.
- Develops, tests, and establishes engineering standards and criteria, specific to MDT methods of data collection and analysis, for assessing the quality of pavement materials. This includes evaluation of engineering, mathematical, and scientific principles; specialized information systems technologies; and materials characteristics to develop various standards for data collection and analysis.
- Administers the automated data collection workstations. This involves managing the pavement condition and image data collected by the Automated Data Collection vans. Overseeing the automated analyses (rutting and cracking), ensuring data backup and transfer to ISD. Interacts with ISD regarding image viewer data files to ensure video

collected meets image viewer requirements. This includes coordination of route collection, schedule and video quality. Informing ISD when image data is available for upload to viewer application.

- Researches and evaluates construction costs to establish and maintain a database of current treatment costs. Performs cost modeling of various treatment types and makes recommendations for the use of pavement life cycles in performance modeling.
- Analyzes and evaluates pavement condition data to develop technically defensible results and conclusions related to performance of materials under varying influences (e.g., weather, topography, stresses, etc.). Researches, analyzes, and determines probable causes of and treatments for pavement deficiencies. The Data Quality Specialist analyzes the most complex projects within the Pavement Management System (PvMS) for construction, materials characteristics, data collection methods, or information system operations.
- Evaluates advanced software designs and modifications provided by vendor(s) to ensure that products conform with specifications, provide compatibility with existing MDT information systems, and provide efficiency and cost-effectiveness. Plans and develops new or modified system functions and operations; coordinates with vendor(s) throughout implementation; and identifies and explains technical problems to ensure effective system operations. This includes analyzing and explaining data relationships, locations, collection methods, relevance, and other statistical and mathematical considerations to ensure the system meets advanced data analysis needs.
- Oversees information systems development and administration related to data. Researches data for pavement performance models to forecast pavement conditions and determine optimum treatment methods that ensure safety while promoting efficient and cost-effective maintenance and repair. The Data Quality Specialist utilizes specialized computer applications, analytical results, and materials engineering theories and principles to provide technical assistance for developing performance models.

### **Technical Assistance, Training, and Reporting**

**- 30%**

Provide technical assistance, training, and direction to Road Profile Analysts, ISD and Engineering Design by providing direction, supplying information, and responding to inquiries to ensure compliance with requirements and efficiency; transition of data and acceptable use of data in preparation of design plans. This includes serving as a technical authority and resource on design data and software tools, ensuring the adequacy of documentation and compliance with requirements, and providing quality assurances pavement condition data. Provide training and technical assistance to MDT customers for pavement data supporting software/data use in design.

The Specialist develops reports tailored to specific audiences. Reports and presentations must be accurate, applicable, and presentable in a manner for easy assimilation by public officials, including Legislators, the Governor's staff, the Director's staff, MDT Administrators, Federal Highway Administration Officials and others. Due to the impact of the reports and presentations on taxpayers and/or the traveling public and on the Construction and Maintenance Improvement Programs, the reports and presentations will be subject to close scrutiny and controversy. Therefore, it is imperative that all reports and presentations are presented in a clear concise manner and are developed using statistically valid data, models, and techniques that can withstand critical review by department and non-departmental personal.

- Develop analytical reports or provide technical assistance on pavement conditions, influences, and treatments for Montana's 24,000 lane miles of roadway. Anticipates information and project needs of MDT staff and others to compile, analyze, and report on relevant issues. This includes cyclical and specialized reports intended to translate highly technical information to various audiences (e.g., engineers, planners, local officials, etc.) by incorporating computerized designs, presentation tools, and statistical representations.
- Provide guidance on current pavement condition and treatment recommendations to the Department via annual reporting mechanisms that include hard copy reporting, internal electronic forms and web reporting.
- Prepares specialized pavement research reports and analysis projects in response to specific requests. This includes forensic studies of failing pavements, PvMS data analyses, performance trends and characteristics, and a range of other interests. Develops original research and analysis methods, standards, tools, as necessary to fulfill specialized requests.

### **Pavement Research and Special Studies**

**- 10%**

- Uses data from the Pavement Management System and the skilled use of computers to perform research and analysis on pavements, as requested. This research includes performing pavement forensic studies on exceptionally well performing pavements and pavements that are prematurely failing. Conclusions and recommendations are generated using reports, graphs, spreadsheets, bar charts, pie charts and computer-generated slide presentations.
- Represents the Bureau on technical research committees, advisory panels, workgroups, and other meetings to provide specialized materials expertise, recommend solutions to engineering and data problems, develop standards and procedures, conduct collaborative research, and exchange information.

### **Other Duties - 5%**

Performs a variety of special studies, project management activities, and other duties as assigned by supervisors in support of the Department mission and Division objectives.

### **Supervision**

The number of employees supervised is: 0

### **Physical and Environmental Demands:**

- Light lifting and carrying (usually less than 10lbs.)
- Remaining seated for extended periods of time, with occasional walking; standing; bending
- Traveling within the state to project locations, and out of state travel by air to national conferences and meetings
- Operating a personal computer
- Communicating in writing, in person, and over the phone

### **Knowledge, Skills and Abilities (Behaviors):**

Concepts and theories of civil engineering, mathematics, statistics, and the physical sciences; computer technology; technical research and analysis methods and procedures; highway economic; Engineering Division objectives and Materials Bureau goals; State, federal, AASHTO, and FHWA

standards; project management and documentation; material specifications; advanced mathematics including algebra, geometry; construction processes, estimating; technical writing. Skill in analyzing and interpreting technical data; operating specialized information systems; project management; planning and organizing the work of others; motivating subordinates; drawing conclusions and making recommendations based upon technical analyses and professional judgments; and communicating complex technical information to varied audiences, spreadsheet, and word processing software (Excel, Word, etc.); communicating effectively both verbally and in writing.

**Minimum Qualifications (Education and Experience):**

The required knowledge and skills are typically acquired through a combination of education and experience equivalent to Bachelor’s Degree in Civil Engineering or related fields, other Engineering disciplines, Mathematics, Computer Science, or a related field.

This position requires a minimum of two (2) years of related work experience in the areas of pavement management; data collection, management, analysis, and research; or project management.

Certifications, licensure, or other credentials include: Fundamentals of Engineering (FE) is preferred.

Alternative qualifications include: A related Master’s degree may substitute for two (2) years of required work experience. Any combination of additional related work experience and education equivalent to the minimum qualifications.

**Special Requirements:**

*List any other special required information for this position*

- |  |  |
|--|--|
| <input type="checkbox"/> Fingerprint check | <input checked="" type="checkbox"/> Valid driver’s license |
| <input type="checkbox"/> Background check  | <input type="checkbox"/> Other; Describe                   |
| Union Code                                 | Safety Responsibilities                                    |

The specific statements shown in each section of this description are not intended to be all inclusive. They represent typical elements and criteria considered necessary to perform the job successfully.

**Signatures**

My signature below indicates the statements in the job description are accurate and complete.

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|                             |              |             |
|-----------------------------|--------------|-------------|
| <b>Immediate Supervisor</b> | <b>Title</b> | <b>Date</b> |
|-----------------------------|--------------|-------------|

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| <b>Administrative Review</b> | <b>Title</b> | <b>Date</b> |
|------------------------------|--------------|-------------|
|------------------------------|--------------|-------------|

My signature below indicates that I have read this job description.

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| <b>Employee</b> | <b>Title</b> | <b>Date</b> |
|-----------------|--------------|-------------|
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**Human Resources Review**

**Job Code Title: Engineering Analyst 1 Job Code Number: D25011**

My signature below indicates that Human Resources has reviewed this job description for completeness and has made the following determinations:

- |   |  |
|---|--|
| <input type="checkbox"/> FLSA Exempt                        | <input checked="" type="checkbox"/> FLSA Non-Exempt        |
| <input type="checkbox"/> Telework Available                 | <input checked="" type="checkbox"/> Telework Not Available |
| <input checked="" type="checkbox"/> Classification Complete | <input type="checkbox"/> Organizational Chart attached     |

**Human Resources:**

Tiffany Thornton HR Generalist

6/15/2022

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| <b>Signature</b> | <b>Title</b> | <b>Date</b> |
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