

# 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: Communications Technologist**

**Position Numbers: 44001, 44005, 44006, 44010, 44012, 44014, 41028, 41036, 89048**

**Location: Various Locations      Department: Montana Department of Transportation**

**Division and Bureau: Maintenance, Communications Bureau      Section and Unit: n/a**

### **Job Overview:**

The Communications Technologist is responsible for managing the operation, maintenance, and engineering of the land mobile radio communication systems, the Road Weather Information System (RWIS), Information Technology (IT) computer network/telecommunications systems, and variable message signs (VMS). This involves troubleshooting a wide variety of diverse, complex equipment and interconnected systems using methodical analysis and specialized diagnostic equipment to independently identify and resolve problems/issues within an assigned area of the state. The work is typically completed under indirect supervision and includes direct oversight of district personnel and contractors for the completion of projects in a safe and efficient manner. This position is expected to prioritize work based on the hierarchy of need for the Department as set by the Communications Bureau. This position does not directly supervise other staff and reports to the Communications System Engineer.

The position is part of a career ladder.

- **Level 1** work includes a general understanding and knowledge of land mobile radio and telecommunications, with limited authority and more direct supervision.

It is expected employees will move up the career ladder to the Level 2.1 position. The maximum amount of time an employee can be in the Level 1 position is 2 years, not including time spent in a training assignment. If these requirements are not met, it may result in disciplinary action up to and including termination.

- **Level 2.1** work requires the incumbent to be proficient, fully functional and demonstrate the ability to perform, operate, maintain, and repair land mobile radio communication systems; perform routine maintenance on the RWIS; install, repair and troubleshoot

computer/network/telecommunications systems; repair and troubleshoot variable message signs (VMS). Assumes responsibility and is given the authority to complete higher-level activities with general supervision.

- **Level 2.2** work requires an advanced understanding of traffic signal operation, traffic signal cabinets, traffic signal systems, traffic signal timing, traffic signal controller and peripheral equipment (conflict monitor/MMU, vehicle detection, emergency vehicle preemption, railroad preemption). Assumes responsibility and is given authority to complete activities with direct and indirect supervision.
- **Level 3.3** work requires the incumbent to have a thorough knowledge and understanding of traffic signal timing, traffic signal controller and peripheral equipment operation, traffic signal cabinet operation and the Manual on Uniform Traffic Control Devices (MUTCD). Assumes responsibility and is given the authority to complete higher-level activities with general supervision.

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

#### **Systems Management, Maintenance & Repair**

**65%**

#### **Communications Technologist Level 1**

Manage installation, maintenance and repair of land mobile radio communication systems. Basic maintenance and repair of RWIS, IT computer network/telecommunications systems, and VMS. Act as liaison and main point of contact between the Communications Bureau Chief and the Communications Systems Engineer to all other interested parties. Assist the Traffic Signal Technicians with monitoring and maintaining, signalized intersections, and luminaires to ensure the safety of the public and MDT staff.

#### **Land Mobile Radio Communication**

- Diagnose, repair, reconstruct and perform adjustments to land mobile/portable communications equipment using technological analysis, specialized diagnostic equipment and principles of troubleshooting in order to isolate and resolve obstacles/issues which can hinder reliable land mobile communications (both mobile and stationary) in locations that may be remote and difficult to access especially in inclement weather. Check frequencies, identify interference problems and make necessary adjustments to comply with state and federal regulations.
- Utilize specialized computer software to program, interconnect, align, and diagnose microprocessor-based equipment used in land mobile communications equipment.
- Install, maintain, and perform operational analysis on the emergency lighting, land mobile radio, and video recording systems for Motor Carrier Services (MCS) vehicles and within the MCS scale facilities. Ensure all equipment is installed in accordance with manufacturer's specifications and recommendations.

## RWIS

- Operate and maintain the RWIS to ensure current road and weather conditions recorded at strategic locations are available to MDT personnel and the traveling public. Monitor and repair data collection equipment on site and remotely to ensure information is transmitted via standard communication protocols.

## IT computer network/telecommunications systems

- Operate and maintain information technology including computer network and system implementations by analyzing, troubleshooting and resolving problems to ensure compatibility with agency wide systems and requirements to support essential data transfers regarding highway construction and maintenance activities to and from all area offices across the state.
- Utilize sophisticated network tools and test equipment to test network performance and ensure data transmission throughout the entire network.

## VMS

- Install, maintain, troubleshoot and repair permanent and portable VMS equipment to ensure the travelling public is informed in a timely manner of road conditions, emergencies, detours, etc.

## **Communications Technologist Level 2.1**

Manage installation, engineering, maintenance and repair of land mobile radio communication systems, the RWIS, IT computer network/telecommunications systems, VMS, and other technical electronic communication, monitoring and accessory equipment to ensure optimum performance/functionality, longevity and public safety. Complex problem solving using engineering information. Coordinate and collaborate as appropriate on any issues related to communications in assigned area. Provide technical expertise in the consideration of equipment needs and concerns and provide assistance as needed.

## Land Mobile Radio Communication

- Research, evaluate and implement new technologies and modify existing equipment to meet emerging needs. Plan, design, and execute or oversee on-site construction.
- Evaluate problems using engineering schematics, electronic theory, and radio communication principles as the first line expert technician to maintain vital communication links in assigned area. Devise work-arounds, new methods and techniques to resolve problems.
- Perform continuous evaluations to improve the land mobile communication systems and assist with design and strategic placement of antennas, base stations, relays, transceivers and other equipment based on careful analysis of factors influencing effective radio reception/transmission.

## RWIS

- Install and assist in the design phase of the RWIS.

## IT computer network/telecommunications systems

- Manage the performance and placement of departmental computer local area networks (LAN) and the wide area networks (WAN); and develop network plans, designs, and computer network wiring using functional analysis of the proposed network plans and understanding of the network capabilities.
- Oversee and coordinate the installation and design of IT infrastructure installed within MDT facilities.
- Develop integration strategies between current and future systems; serve as liaison with department staff and external personnel (e.g. contractors, vendors); provide direction and information to department staff; coordinate service, equipment procurement and implementation.
- Remain current on emerging technologies and the potential effectiveness of these advancements in their current system.
- Manage divisional telecommunication systems, develop divisional telecommunication network plans and make recommendations concerning the most appropriate implementation strategies to ensure effective inter and intra telecommunications and to meet clientele obligations. Maintain or restore performance of telecommunications systems including but not limited to; PBX telephone systems and solid state voice messaging systems for road and construction reports.

## VMS

- Be the technical expert on the VMS operation and maintenance of the sign. Evaluate and provide recommendations for future development as new technology is available.

### **Communications Technologist Level 2.2**

Advanced understanding of traffic signal operation, traffic signal cabinets, traffic signal systems, traffic signal timing, traffic signal controller and peripheral equipment (conflict monitor/MMU, vehicle detection, emergency vehicle preemption, railroad preemption). Assumes responsibility and is given authority to complete activities with direct and indirect supervision.

### **Communications Technologist Level 2.3**

Thorough knowledge and understanding of traffic signal timing, traffic signal controller and peripheral equipment operation, traffic signal cabinet operation and the Manual on Uniform Traffic Control Devices (MUTCD). Able to fully perform job duties of a Traffic Signal Technician. Assumes responsibility and is given the authority to complete higher-level activities with general supervision.

## **System Design and Construction Oversight**

**25%**

### **Communications Technologist Level 1**

Plan, organize, and install various MDT communication, warning, and monitoring systems, and related equipment. Work with District personnel, contractors and effected parties to ensure decisions align with the Bureau's missions and objectives. Under direct and indirect supervision.

- Install video surveillance systems within MDT facilities to enhance safety and monitor for vandalism/theft.

- Manage and oversee the communications shop containing a large inventory of components, tools and equipment used to maintain, diagnose and repair complex integrated communications systems.
- Track and/or procure necessary tools, electronic components, software, and other items needed to keep all communications systems operating at optimum capacity.

### **Communications Technologist Level 2.1**

Plan, organize, coordinate, and direct the design, installation, expansion, and operation of various MDT communication, warning, and monitoring systems, and related equipment. This includes coordinating and directing projects, district personnel, contractors, and communication between all parties to ensure smooth and efficient system operations that meet the communication needs of the MDT. Making decisions that align with the Bureau's mission and objective. Under indirect and remote supervision.

- Establish and monitor project time lines and priorities.
- Design, develop and present concepts and system layouts to the Communications Bureau Chief or the Communications Systems Engineer. Provide expertise, fundamental data and resources to management relating to substantiating the advantages and disadvantages of large-scale departmental projects.
- Monitor projects by directing contract employees and departmental employees on accomplishing large technical projects within established time parameters.
- Research new replacement materials estimating monetary benefits and dependability and ensure appropriate procedures specified by the FCC rules and regulations and departmental policies have been followed so that agencies serviced are not in violation.
- Oversee the preparation and distribution of data, schematics, correspondence and information materials related to the public safety radio communication system; develop network documentation and schematic diagrams for future reference and ensure proper maintenance of required FCC licenses.
- Design, modify and install video surveillance systems. Remain current on new and emerging technologies.

### **Communications Technologist Level 2.2**

Advanced understanding of traffic signal design, operation, and maintenance. Ability to implement and oversee construction and maintenance activities of traffic signal repair and installation. Oversight of MDT personnel, as well as, contractual agreements for maintenance and construction activities at signalized intersections. Assumes responsibility and is given authority to complete activities with direct and indirect supervision.

### **Communications Technologist Level 2.3**

Thorough knowledge of traffic signal design, operation and maintenance. Ability to assess malfunctions or damage caused by external factors to create innovative and unique solutions to correct traffic signal/traffic signal system problems. Implement system repairs required for normal traffic signal operation to resume. Assumes responsibility and is given the authority to complete higher-level activities with general supervision.

**Other Duties as Assigned****10%**

This position performs a variety of other duties as assigned by the Communications Bureau Chief or the Communications Systems Engineer in support of the department mission and bureau objectives including but not limited to providing training to personnel; travelling in and out of state to project locations, conferences, and meetings; repair and maintenance of MDT's private fueling sites; support MDT's Traveler Information Systems (TIS) through hardware/software upgrades and implementation; and related duties as assigned.

**Supervision**

The number of employees supervised is: 0

The position number for each supervised employee is: n/a

**Physical and Environmental Demands:**

- Requires the ability perform work activities under periodic stressful situations; be away from home for consecutive weeks at a time; and travel alone in excess of 25,000 (twenty five thousand) miles annually.
- Requires the ability to use various modes of transportation including (but not limited to) snow shoes, snowmobiles, ATVs, four wheel drive pickups, horseback, and helicopter under normal to extremely adverse weather conditions in order to access critical sites located in populated or remote mountain top locations.
- Requires the ability to lift or move heavy objects (120 pounds).
- Requires the ability to place radios and other electronic devices in vehicles and equipment which requires all types of lifting and maneuvering in cumbersome positions and restrictive spaces such as under dashes and in trunks.
- Requires the ability to safely climb towers and utility poles and work at heights in excess of 300 (three hundred) feet for long periods of time in all types of weather conditions.

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

- Requires knowledge in land mobile radio communication and telecommunication methodologies, principles and practices including analyzing problems and providing solutions in compliance with the Federal Communications Commission (FCC) rules and regulations; local, state and federal policies; and specifications and guidelines as they apply to the needs of the agencies serviced.
- Requires knowledge of the principles of electrical/electronics engineering.
- Installation, maintenance and repair of specialized digital and analog electronic equipment used within the industry.
- Principles and practices associated with local and wide area computer networks.

- Working knowledge of the Manual of Uniform Traffic Control Devices (MUTCD), the National Electrical Code, and standards from the National Electrical Manufacturers Association.

Skills:

- Requires skills in the use of complex electronic equipment including system analyzers, spectrum analyzers, miniature electronics soldering/desoldering equipment, local area network analyzers, computers and associated software packages used in the design, programming, diagnostics and maintenance of complex electronic and communications systems.

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

**Level 1:**

The required knowledge and skills are typically acquired through a combination of education and experience equivalent to Associates Degree in electronics, telecommunications, construction technology, or related field, or a related field.

Experience: 1 year of experience in land mobile radio communication or a related field.

Alternative combinations of related education and experience may be considered.

**Level 2.1:**

The required knowledge and skills are typically acquired through a combination of an Associate's Degree in electronics, telecommunications, construction technology or related field.

Experience: 3 years of technical experience specific to land mobile radio communication including project development, system installation and working familiarity with various systems and network designs.

Alternative combinations of related education and experience may be considered.

Certifications, licensure, or other credentials include: Have and retain licensure as a FCC General Radio Telephone Operator. Licensure must be received within 6 months of hire.

**Level 2.2**

Take and pass in-house practical test.

Certifications, licensure, or other credentials include: IMSA Level I Traffic Signal Technician Certification

**Level 2.3**

Take and pass in-house practical test.





**Human Resources Review**

**Job Code Title: Communications Technologist 1    Job Code Number: T22011    Pay Band:**

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:**

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