



Using the framework described earlier, we begin to construct the Transportation Competency model tier by tier.

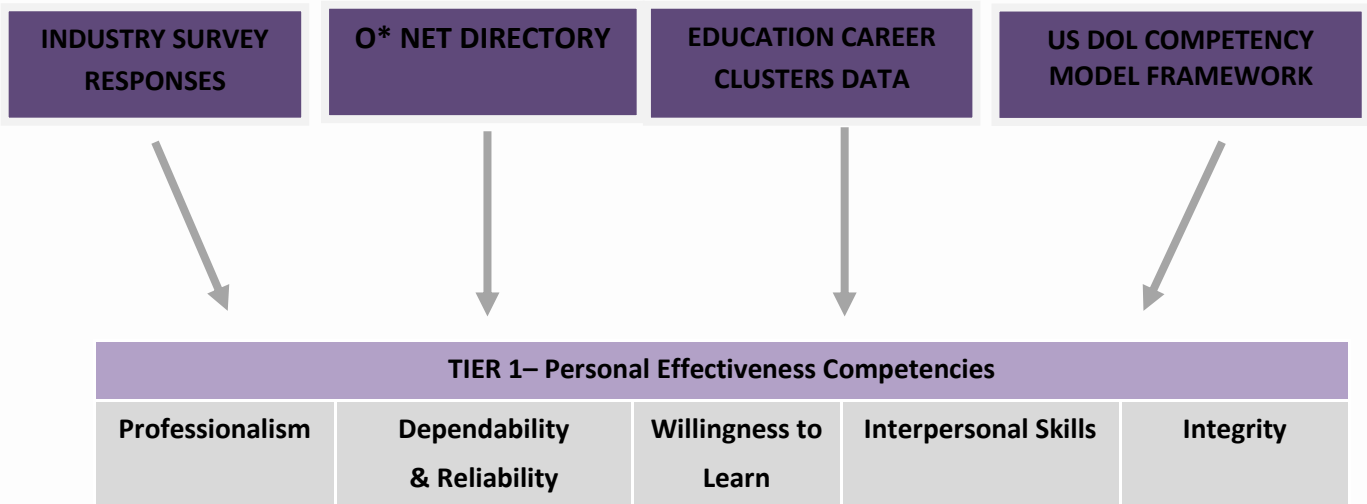


Foundational Competencies

The **Foundational Competencies** block includes Tiers 1 through 3 and the essentials for early success in school and work life are identified. These competencies are integral for all workers to be successful in any organization and across all occupations in all industries. An industry survey with a specific set of questions was designed and administered to Transportation industry professionals in the region to identify the competencies in this tier. Often business leaders elaborated on certain competencies outside the survey questions, which was also incorporated into the tiers.

**Tier 1: Personal Effectiveness Competencies**

Starting at the bottom of the pyramid this tier is comprised of competencies that are often referred to as “soft skills” and essential in all life roles. Using the US DOL competency model as a framework, the survey results were mapped against O\*Net<sup>14</sup> (a system that serves as the nation's primary source of occupational information, providing comprehensive information on key attributes and characteristics of workers and occupations) and Education Clusters data to develop this tier.





Each competency is then described in terms of behavioral attributes.

### Professionalism

Attributes
Demonstrates self discipline, self-worth and positive attitude in a work situation
Is free from substance abuse
Maintains a professional appearance
Complies with organizational policies and procedures
Takes responsibility for one's own work assignment

### Dependability & Reliability

Attributes
Follows policies and procedures, thus exhibiting commitment to the organization
Diligently follows through on commitments and consistently meets deadlines
Demonstrates regular and punctual attendance

### Willingness to Learn

Attributes
Is flexible and willing to learn new knowledge and skills
Develops a personal career plan to meet career goals and objectives
Takes charge of personal career development by identifying occupations interests, strengths, options and opportunities

### Interpersonal Skills

Attributes
Maintains open communication with others, recognizes and accurately interprets the verbal and non verbal behavior of others.
Demonstrates culture and diversity awareness
Displays adequate concern for others by being sensitive to their needs and feelings

### Integrity

Attributes
Abides by a strict code of ethics and behavior
Treats others with honesty, fairness and respect
Takes responsibility for one's actions and for those of one's group, team or department

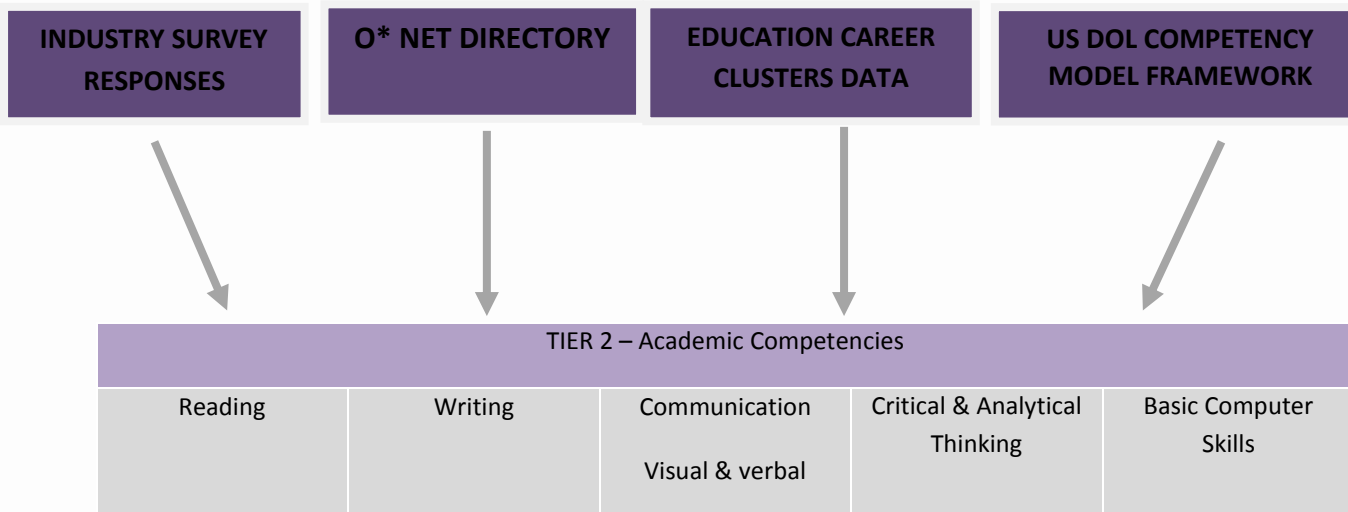
Foundational Competencies





## Tier 2—Academic Competencies

The second tier in the Foundation competencies block covers basic educational competencies that are learned in an educational setting along with cognitive functions and thinking styles. Typically these competencies form the foundation for the Occupation and Industry specific Competencies. This tier was also developed by mapping the survey results against O\*Net and Education Clusters data.



Each competency is then described in terms of behavioral attributes.

### Reading

Attributes
Comprehends and evaluates oral and written information in documents such as maps; navigation charts, switching orders, train orders, or arrival and departure schedules, technical drawings, work orders, instructions, formulas or processing charts, technical operating, service or repair manuals
Locates written information from various sources to communicate with co-workers and clients or participants
Critically evaluates and analyzes information in written materials
Applies what is learned from written material to follow instructions and complete specific tasks

### Writing

Attributes
Demonstrates ability to organize/collect, evaluate and present written information in the form of reports, graphs, flow charts, directions and manuals
Communicates thoughts, ideas, information, messages and other written information in a logical and coherent manner
Adapts language for audience, purpose, situation

### Communication

Attributes
Interprets verbal and non verbal behaviors to enhance communication with co-workers and clients / participants





- Applies active listening skills to obtain and clarify information
- Speaks clearly and confidently in a logical manner
- Receives, attends to, interprets, understands and responds to verbal messages
- Understands and acts upon instruction to complete assignments
- Signals and observes directions or warnings to and from coworkers
- Recognizes universal signs and symbols such as colors, flags, stakes to function safely in the workplace

### Critical and Analytical Thinking

- Attributes
  - Demonstrates sufficient inductive and deductive reasoning ability to perform job
  - Identifies connections between issues, quickly understands, orients and changes direction as and when necessary
  - Simple solutions to problems, common sense

### Basic Computer Skills

- Attributes
  - Understands and efficiently uses basic computer hardware and software to perform tasks and is familiar with fundamental capabilities of computers
  - Enters data into computer with acceptable degree of accuracy
  - Uses word processing programs to create, edit and retrieve files
  - Uses spreadsheet software to enter, manipulate, edit and format text and numerical data
  - Uses electronic mail applications
  - Uses the internet and web based tools to manage basic workplace tasks

### Tier 3 —Workplace Competencies

The competencies in this tier include those skills and abilities that permit an individual to conduct his/her work related activities in an effective and efficient manner. These competencies were derived from the Education Career Cluster Data and the US DOL Competency Model Framework.





**EDUCATION CAREER  
CLUSTERS DATA**

**US DOL COMPETENCY  
MODEL FRAMEWORK**

TIER 3 – Workplace Competencies				
Teamwork	Customer Focus	Planning & Organizing	Problem Solving & Decision Making	Working with Tools & Technology

Each competency is then described in terms of behavioral attributes.

**Foundational Competencies**

**Teamwork**

Attributes
Builds interpersonal skills with individuals and other team members
Recognizes the importance of teamwork and its impact on business
Gives and receives feedback constructively
Leverages the strengths of others to accomplish a common goal

**Customer Focus**

Attributes
Provides prompt, efficient and personalized assistance to meet the requirements, requests, and concerns of customers
Demonstrates ability to assist customers in a professional manner
Provides thorough, accurate information to answer customers’ questions and informs them of commitment times or performance guarantees

**Planning & Organizing**

Attributes
Plans and prioritizes work to manage time effectively and accomplish the assigned tasks
Develops plan, timeline, list of resources required, goals for projects and adheres to them
Finds ways to organize work to accomplish tasks more efficiently
Anticipates obstacles to project completion and develops contingency plans to address them

**Problem Solving and Decision Making**

Attributes
Identifies or recognizes the existence of a problem and analyzes the components of it





Generates a variety of solutions to the problem

Effectively uses both internal and external resources to locate and gather information relevant to the problem

### Working with Tools and Technology

#### Attributes

Identifies, selects, and applies appropriate tools or technological solutions to frequently encountered problems

Demonstrates appropriate use of basic tools to complete work functions

Operates tools and technology including( cleaning equipment; emergency fire or rescue equipment; hoist, winch or hydraulic boom; navigation technology or equipment; packaging or banding machine or equipment; track switches; global positioning systems (GPS) technology; hand or power tools; two way radio or mobile phone; vehicle repair tools or safety equipment; weighing or measuring devices in transportation

Uses appropriate personal protective equipment

Uses tools, equipment, and machinery safely and appropriately



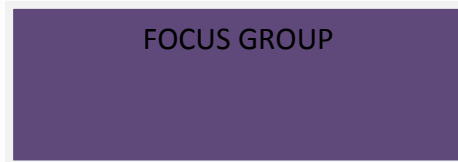


The second block of the pyramid are **Industry Related Competencies** that are common to all jobs within a particular industry i.e. Transportation in this case. Tiers 4 & 5 reflected the consensus of industry professionals collected from these experts in a tightly-focused work session. The panel consisted of business leaders, managers, and education and training providers.

Industry Related Competencies

#### Tier 4 — Industry-Wide Technical Competencies

The first tier in Industry related competencies represents the knowledge, skills and abilities required by all occupations within a specific industry. Each industry has a unique set of technical competencies that have been defined by the respective subject matter experts (SME's). To derive these competencies, representatives from Missouri's Transportation industry met and brainstormed in a focus group setting.



Logistics, Planning & Management	Transportation Operations & Maintenance	Regulations & Quality Assurance	Health, Safety & Environment
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#### Logistics Planning and Management

##### Planning

Plans, organizes and executes logistics support activities such as maintenance planning, repair analysis and test equipment recommendations

Develops plans including routes and schedules for transporting people and goods

Determines locations of facilities and services within logistics networks





Determines transfer points for cargo

Develops documentation and information flow requirement and solutions

Determines documentation and other requirements

Plans and implement security measures to minimize loss and to create trust

**Scheduling**

Develops transportation routes and schedules

Schedules people, transportation equipment, and related resources

Adjusts planned routes and schedules in response to changing conditions and customer requirements

**Monitoring**

Maintains information on the movement of people/goods according to planned routes and schedules

Monitors the performance of transportation operations in meeting planned schedules and deliveries

Monitors and adjust transportation plans

Ensure that cargo arrives at the right location, on time and in the safest, most economical manner

**Transportation Operations & Maintenance**

**Transportation Operations**

Demonstrates understanding of activities related to dispatching, routing, and tracking transportation vehicles

Reviews route date prior to leaving for destination, schedules to obtain cargo loading information and traffic routing or control plans and schedules

**Modes of Transportation**

Rail – provides rail transportation of cargo using railroad rolling stock

Water – provides water transportation of cargo using watercraft such as ships, barges and boats

Truck – provides over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers

Intermodal – provides transportation of freight using multiple modes of transportation, commonly taking place at a terminal specifically designed for such a purpose

**Maintenance**

Maintains the mobile equipment and monitors to maintain reliability and performance

Diagnoses reliability performance problems of equipment, subsystems, and/or components including electrical/electronic, fluid power, and mechanical systems and computer control systems

Prepares and maintains maintenance records and logs according to company policies and procedures and government regulations

Develops preventative maintenance plans and systems

Cleans equipment or machinery

Examines vehicles to detect malfunctions, damage or maintenance needed

Services vehicles with water, fuel or oil

**Regulations & Quality Assurance**

**Compliance with Regulations and Standards**

Complies with local, state and federal and international laws

Identifies and adheres to tariff and trade restrictions, transportation laws, labeling regulations, trade regulations, environmental regulations, OSHA regulations, requirements for global hazardous material packing; domestic and international regulations

Maintains transportation logs and other documents and records required by organizational policies and government laws and regulations





Maintains compliance with security and loss prevention systems

Maintains compliance with health, safety and environmental management requirements

Ensures compliance with organizational policies, contractors and service providers and government laws and regulations

#### **Quality Assurance Continuous Improvement**

Demonstrates knowledge of quality management systems and tools such as TM, Enterprise Lean and Six Sigma methodology and follows necessary procedures in work functions

Records, tracks and reports quality issues

#### **Maintain and Inspecting**

Ensures equipment is operating to prescribed standards

Inspects vehicle and equipment to determine repair or replacement needs

Inspects incoming/outgoing freight for tampering

Oversees work progress to verify safety or conformance standards

Monitors operations to ensure that staff members comply with administrative policies and procedures, safety rules, union contracts, and government regulations

### **Health, Safety, and Environment**

#### **Health and Safety Procedures**

Prepares for health, safety, environmental emergencies

Follows organizational policies and procedures to maintain a safe work area

Wears personal protective equipment (PPE) as appropriate

Knows how to alert authorities in emergency situations

Follows traffic laws

Adheres to health and safety practices related to storing, cleaning, and maintaining tools, equipment and supplies

Completes safety training on pertinent equipment and applies safe operating procedures

#### **Hazardous Materials(HAZMAT)**

Participates in HAZMAT training as required or appropriate

Explains and correctly identifies hazardous materials, hazardous substances, and marine pollutants

Handles hazardous materials in accordance with governmental regulations and health standards

Knows where to find and how to use emergency response information

Understands the OSHA Hazard Communication Standard

#### **Identifying Hazards and Maintaining Compliance**

Identifies and describes workplace hazards

Demonstrates understanding of major health, safety, and environmental risks

Reports health, safety and environmental problems

Conducts and/or participates in health, safety and environmental incident and hazard investigations and recommend corrective action

Maintains general safety in accordance with governmental regulations, health standards, company policy, procedure and practices

Performs regular audits and inspections to maintain health, safety and environmental compliance

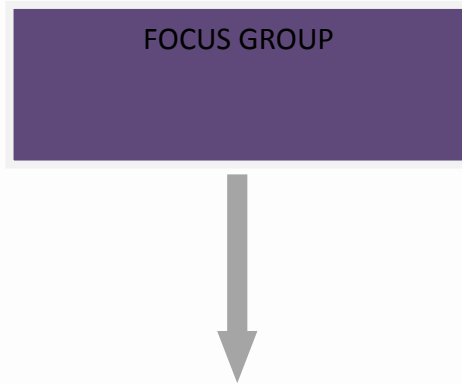
Maintains documentation of compliance with health, safety and environmental management systems





### Tier 5 —Industry-Specific Technical Competencies

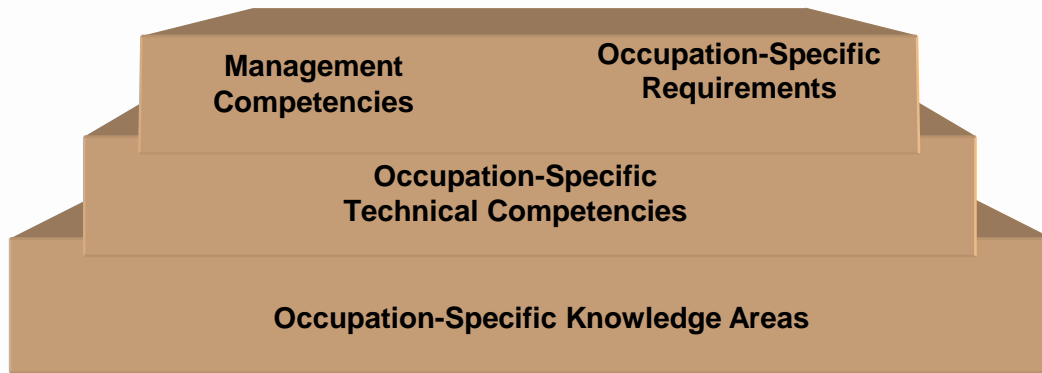
This tier includes competencies that represent knowledge, skills and abilities required for all occupations within a specific industry sector. Missouri staffing patterns reflected high Transportation employment in specific sectors such as **Trucking, Railroad** and **Barge lines**. During the focus group sessions, industry representatives also vetted these as the three major sectors using Transportation in Missouri. Within each of these sectors, Knowledge Areas (KAs) were identified. These KA's provide a list of competencies that all workers in the specific industry must have to be effective in their occupations.



Industry Related Competencies

TIER 5 – Industry-Specific Technical Competencies		
Trucking	Railroad	Barge Lines
Safety Management Spatial Acuity Breakdown Procedures Bridge low-weight Distribution Communication Technology Auxiliary Power Units Hours of Service Rules Trailer Tracking US Department of Transportation, Federal Motor Carrier Safety Regulations and MoDoT Regulations EPA Idling Laws	Safety Rules Operating Rules Signal Aspects and Indications Air Brake and Train Handling Rules Train make-up Hazardous material Handling Federal Railroad Administration laws EPA laws	Safety Rules Fundamental principles of water hydrology, towboat, river flows, currents, eddies, forces and boyes Waterway Operations, traffic and navigation Design / Balance Load Licensing US Coast Guard and Army Corps of Engineers Rules on Barge Operation EPA laws





Occupation Related Competencies

The last group consists of **Occupation related competencies** and is defined in terms of occupation related knowledge, education, credentials and performance. They are derived from the O\*Net directory. A specific list of Transportation occupations has been focused on in these tiers. The 9 Targeted Transportation occupations were identified as follows: a custom industry staffing pattern was identified for the Transportation industry cluster in Missouri. These were sorted by their impact on the economy and then mapped against the US DOL’s In Demand occupation list for Transportation. This list was then vetted by the State’s industry specialists and is as described below:

O*NET-SOC Code	Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer
53-7062	Laborers and Freight, Stock, and Material Movers, Hand
53-1031	First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
43-5032	Dispatchers, Except Police, Fire and Ambulance
53-4011	Locomotive Engineers
43-5011	Cargo and Freight Agents
43-3021	Billing and Posting Clerks and Machine Operators
53-4031	Railroad Conductors and Yardmasters
53-4021	Railroad Brake, Signal and Switch Operators

It is important to note that the occupations in this list are obtained from the state’s list of occupations in the Transportation cluster and do not include the entire gamut of Transportation occupations available.





## Tier 6 —Occupation-Specific Knowledge Areas

This tier contains the specific **knowledge areas** that are required for the 9 targeted Transport occupations. Each knowledge area covers an area of expertise that the respective occupation requires.

O\* NET DIRECTORY



TIER 6 —Occupation Specific Knowledge Areas for :
Truck Drivers, Heavy and Tractor-Trailer
Laborers and Freight, Stock, and Material Movers, Hand
First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
Dispatchers, Except Police, Fire and Ambulance
Locomotive Engineers
Cargo and Freight Agents
Billing and Posting Clerks and Machine Operators
Railroad Conductors and Yardmasters
Railroad Brake, Signal and Switch Operators

Occupation Related Competencies

### Truck Drivers, Heavy and Tractor-Trailer

- Transportation
- Public Safety and Security
- English Language
- Law and Government
- Mathematics





### **Laborers and Freight, Stock and Material Movers, Hand**

- English Language
- Public Safety and Security

### **First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators**

- Transportation
- Customer and Personal Service
- Administration and Management
- Production and Processing
- Public Safety and Security
- Personnel and Human Resources
- Computers and Electronics
- Education and Training
- Mathematics
- Economics and Accounting

### **Dispatchers, Except Police, Fire and Ambulance**

- Transportation
- Clerical
- English Language
- Public Safety and Security

### **Locomotive Engineers**

- Transportation
- Public safety and Security
- English Language

### **Cargo and Freight Agents**

- Transportation
- Customer and Personal Service
- English Language

### **Billing, Posting, and Calculating Machine Operators**

- Clerical
- Economics and Accounting
- English Language

### **Railroad Conductors and Yardmasters**

- Transportation
- Public Safety and Security
- Customer and Personal Service

### **Railroad Brake, Signal, and Switch Operators**

- Transportation
- Customer and Personal Service
- Public Safety and Security





### Tier 7 —Occupation-Specific Technical Competencies

All occupations require certain technical competencies to perform the job. This tier contains **technical competencies** that are specific to the 9 targeted Transportation occupations. Listed below are the

ones required for each technical competency.

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TIER 7 —Occupation Specific Technical Competencies for:
Truck Drivers, Heavy and Tractor-Trailer
Laborers and Freight, Stock, and Material Movers, Hand
First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
Dispatchers, Except Police, Fire and Ambulance
Locomotive Engineers
Cargo and Freight Agents
Billing and Posting Clerks and Machine Operators
Railroad Conductors and Yardmasters
Railroad Brake, Signal and Switch Operators

Occupation Related Competencies





### Truck Drivers, Heavy and Tractor-Trailer

Tools used in this occupation	Technology used in this occupation
Flatbed Trailers – Lowboy trailers, Tilt Trailers Hoist – Cargo hoists Location based messaging service platforms – Satellite linkup systems Snowplow attachments – Plow attachments Telescoping boom lift – Boom trucks Trailer hitches – Sliding fifth wheels; Sliding tandem axles Wheel loaders	Database user interface and query software – Easy Trucker software; Fog Line Software Truckn2004; Truckers Helper software Inventory management software – Computerized inventory tracking software Route navigation software –ALK Technologies PC*Miler; MarcoSoft Quo Vadis

### Laborers and Freight, Stock and Material Movers, Hand

Tools used in this occupation	Technology used in this occupation
Dollies Forklifts – Lift trucks Hand trucks or accessories – Hand trucks Jacks – Pallet jacks Pallet trucks – Pallet transport trucks Wrapping machinery – Banding machines	Database user interface and query software- Data entry software Industrial control software – Machine control software Inventory management software – Inventory tracking software Spreadsheet software

### First line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators

Tools used in this occupation	Technology used in this occupation
Forklifts Hand trucks or accessories – Hand trucks Pallet trucks- Pallet jacks Screwdrivers – Phillips head screwdrivers; Straight screwdrivers Welding tools – Welding equipment	Bar coding software – Barcode software Enterprise resource planning ERP software- SAP software Materials requirements planning logistics and supply chain software - @Road GeoManager; eLading Bill of Lading Software; UPS Logistics Technologies Roadnet Transportation Suite; XATA XATANET Mobile location based service software – Accellos Real Dispatch; Commercial vehicle operation CVO software Office suite software – Microsoft Office





### Dispatchers, Except Police, Fire and Ambulance

Tools used in this occupation	Technology used in this occupation
<p>Rail switching systems – Switch controls; Tower switching machines</p> <p>Railway signaling systems – Centralized traffic control signals; Signal controls</p> <p>Special purpose telephones – Multi-line telephone systems ; Personal banking chamber PBC telephones</p> <p>Two way radios – Mobile radios</p> <p>Vehicular global positioning systems- Job dispatch and vehicle tracking systems</p>	<p>Aviation ground support software- Bornemann Associates Flight Plane; Sabre software</p> <p>Customer relationship management CRM software- Command Alkon COMMANDconcrete; Digital Gateway e-automate</p> <p>Database user interface and query software- Database software; Sky Scheduler software</p> <p>Expert system software – Computer aided dispatching auto routing software; Rail Traffic Track Warrant Control System</p> <p>Mobile location based service software – Air-Trak Cloudberry; Global position system GPS software; Situation resource tracking software; Transportation management software</p>

### Locomotive Engineers

Tools used in this occupation	Technology used in this occupation
Electronic equipment use in the cab	Software used to run trains

### Cargo and Freight Agents

Tools used in this occupation	Technology used in this occupation
N/A	Electronic interface used to do their jobs

### Billing and Posting Clerks and Machine Operators

Tools used in this occupation	Technology used in this occupation
N/A	N/A

### Railroad Conductors and Yardmasters

Tools used in this occupation	Technology used in this occupation
<p>Dock plates – Bridge Plates</p> <p>Rail switching systems – Switching systems controls</p> <p>Specialty wrenches – Switch adjusting wrenches; Terminal wrenches</p> <p>Wire or cable cutters – Cable sheath cutters</p>	<p>Expert system software – Positive train control PTC systems</p> <p>Industrial control software – Automated equipment identification AEI software; RailComm DocYard; SAIV Integrates AEI Software; Softrail AEI Automatic Yard Tracking System</p> <p>Inventory management software- Inventory tracking software; Softrail AEI Rail &amp; Road Manager</p> <p>Materials requirement planning logistics and supply chain software – Bourque Data Systems YardMaster; Freight reservation software</p> <p>Office suite software – Microsoft Office</p>





### Railroad Brake, Signal and Switch Operators

Tools used in this occupation	Technology used in this occupation
N/A	Signals and switching equipment

### Tier 8 – Occupation Specific Requirements

This tier includes **occupation specific job credentials** such as educational degrees, certifications, licensures, physical training requirements specific to a particular occupation within an industry. The US Department of Education provides a taxonomic scheme of programs of study and descriptions called Classification of Instructional Programs (CIP). The National Crosswalk Service Center linked this data with the list of occupations in the O\*NET Directory and created a comprehensive list of instructional programs for each occupation in each industry.

Occupation Related Competencies

