Transportation, Distribution, and Logistics Competency Model

Updated February 2014
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ABOUT THE MODEL

The Transportation, Distribution, and Logistics Competency Model is depicted in a tiered graphic. The arrangement of the tiers in a pyramidal shape is not meant to be hierarchical, or to imply that competencies at the top are at a higher skill level. The model’s shape represents the increasing specialization and specificity in the application of skills as one moves up the tiers. Tiers 1-5 have been developed and are divided into blocks. The blocks represent competency areas, that is, the applied skills, knowledge, and abilities essential to successful performance in the transportation, distribution, and logistics industry. A table of the competency definitions and associated key behaviors follows the graphic.

Tiers 1 through 3 contain Foundation Competencies, which form the foundation needed to be ready to enter the workplace.

Tier 1 – Personal Effectiveness competencies are essential for all life roles. Often referred to as "soft skills," personal effectiveness competencies are generally learned in the home or community and are reinforced and honed at school and in the workplace. They represent personal attributes that may present some challenges to teach or assess.

Tier 2 – Academic Competencies are critical competencies primarily learned in a school setting. They include cognitive functions and thinking styles. Academic competencies are likely to apply to most industries and occupations.

Tier 3 – Workplace Competencies represent motives and traits, as well as interpersonal and self-management styles. They generally are applicable to a large number of industries and occupations.

Tiers 4 and 5 contain Industry Competencies, which are specific to an industry or industry sector.

Tier 4 – Industry-Wide Technical Competencies represent the knowledge and skills that are common across the sectors within the broader transportation industry. These technical competencies build on, but are more specific than, competencies represented on lower tiers.

Tier 5 – Transportation Sectors are listed on Tier 5 (along with their key concepts and sample lists of related occupations) to illustrate that the Transportation, Distribution, and Logistics Competency Model serves as a foundational resource for all of these sectors. The sector competencies may be developed by their respective associations or communities of practice.

The upper tier represents the specialization that occurs within specific occupations within an industry. Information on occupational competencies is available through O*NET OnLine (http://online.onetcenter.org/).
## Tier 1—Personal Effectiveness Competencies

<table>
<thead>
<tr>
<th>1. <strong>Interpersonal Skills</strong>: Displaying skills to work with others from a range of backgrounds.</th>
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</thead>
<tbody>
<tr>
<td><strong>Maintaining Open Communication</strong></td>
</tr>
<tr>
<td>- Maintains open lines of communication with others</td>
</tr>
<tr>
<td>- Recognizes and accurately interprets the verbal and nonverbal behavior of others</td>
</tr>
<tr>
<td>- Establishes a high degree of trust and credibility with others</td>
</tr>
<tr>
<td><strong>Working with Diverse People</strong></td>
</tr>
<tr>
<td>- Is flexible and open-minded when dealing with a wide range of people</td>
</tr>
<tr>
<td>- Listens to and considers others’ viewpoints</td>
</tr>
<tr>
<td>- Works well and develops effective relationships with diverse personalities</td>
</tr>
<tr>
<td>- Demonstrates respect for the opinions, perspectives, and individual differences of others</td>
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<tr>
<td>- Values diversity of people and ideas</td>
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<table>
<thead>
<tr>
<th>2. <strong>Integrity</strong>: Displaying accepted social and work behaviors.</th>
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<tbody>
<tr>
<td><strong>Behaving Ethically</strong></td>
</tr>
<tr>
<td>- Abides by a strict code of ethics and behavior</td>
</tr>
<tr>
<td>- Chooses an ethical course of action and does the right thing, even in the face of opposition</td>
</tr>
<tr>
<td>- Differentiates between legal and ethical issues</td>
</tr>
<tr>
<td>- Performs work-related duties according to laws, regulations, contract provisions, and policies</td>
</tr>
<tr>
<td><strong>Acting Fairly</strong></td>
</tr>
<tr>
<td>- Treats others with honesty, fairness, and respect</td>
</tr>
<tr>
<td>- Makes decisions that are objective and reflect the just treatment of others</td>
</tr>
<tr>
<td>- Is willing to have tough conversations when others need to be corrected</td>
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<tr>
<td><strong>Taking Responsibility</strong></td>
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<tr>
<td>- Takes responsibility for accomplishing work goals within accepted timeframes</td>
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<tr>
<td>- Accepts responsibility for one’s actions and for those of one’s group, team, or department</td>
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<tr>
<td>- Makes an effort to learn from mistakes</td>
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<tr>
<td>- Takes personal responsibility and accountability</td>
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<thead>
<tr>
<th>3. <strong>Professionalism</strong>: Maintaining a professional demeanor.</th>
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<tr>
<td><strong>Demonstrating Self-Control</strong></td>
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<tr>
<td>- Demonstrates self-control by maintaining composure and keeping emotions in check even</td>
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</table>
in difficult situations
- Deals calmly and effectively with stressful situations
  - Demonstrates emotional intelligence

Maintaining Professional Demeanor
- Projects a professional image of oneself and the organization
- Dresses appropriately for the occupation and its requirements
- Maintains appropriate personal hygiene
- Remains free from substance abuse
- Demonstrates a positive attitude towards work
- Takes pride in one’s work and the work of the organization
- Demonstrates a positive attitude towards work

Social Responsibility
- Remains free from substance abuse
  - Maintains a healthy lifestyle

Self Development
- Takes charge of personal career development by identifying occupational interests, strengths, options, and opportunities
- Makes insightful career planning decisions based on integration and consideration of others’ feedback, and seeks out additional training to pursue career goals

4. Initiative: Demonstrating a willingness to work.

Showing Commitment

Persisting
- Pursues work with energy, drive, and a strong accomplishment orientation
- Persists and expends extra effort to accomplish tasks even when conditions are difficult or deadlines are tight
- Persists at a task or problem despite interruptions, obstacles, or setbacks
- Exerts effort toward task mastery

Taking Initiative
- Takes initiative in seeking out new work challenges and increasing the variety and scope of one’s job
- Establishes and maintains personally challenging but realistic work goals
- Goes beyond the routine demands of the job
- Seeks opportunities to influence events and originate action

Working Independently
- Works effectively and efficiently
  - Is solutions-oriented
- Is able to perform effectively even with minimal direction, support, or approval and without direct supervision

**Demonstrating Motivation**
- Is intrinsically driven to succeed and excel
- Strives to exceed standards and expectations

**Working Independently**
- Demonstrates own ways of doing things
- Is able to perform effectively even with minimal direction, support or approval and without direct supervision
- Exhibits confidence in one’s capabilities and an expectation to succeed in future activities

### 5. Dependability and Reliability: Displaying responsible behaviors at work.

**Fulfilling Obligations**
- Behaves maturely, consistently, and predictably
- Is reliable, responsible, and dependable in fulfilling obligations
- Diligently follows through on commitments and consistently meets deadlines
- Demonstrates regular and punctual attendance; rarely is late for meetings or appointments
- Follows written and verbal directions
- Complies with organizational rules, policies, and procedures

**Attending to Details**
- Diligently checks work to ensure that all essential details have been considered
- Notices errors or inconsistencies that others have missed, and takes prompt, thorough action to correct errors

### 6. Adaptability and Flexibility: Being open to change and to considerable variety in the workplace.

**Entertaining New Ideas**
- Is open to considering new ways of doing things
- Actively seeks out and carefully considers the merits of new approaches to work
- Embraces new approaches when appropriate and discards approaches that are no longer working

**Dealing with Ambiguity**
- Takes proper and effective action when necessary without having to have all the necessary facts in hand
- Easily changes gears in response to unpredictable or unexpected events, pressures, situations, and job demands
- Effectively changes plans, goals, actions, or priorities to deal with changing situations
7. **Lifelong Learning: Willingness to Learn**: Understanding the importance of learning new information for both current and future problem solving and decision making.

<table>
<thead>
<tr>
<th><strong>Demonstrating an Interest in Learning</strong></th>
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<tbody>
<tr>
<td>▪ Demonstrates an interest in personal learning and development</td>
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<tr>
<td>▪ Seeks feedback from multiple sources about how to improve and develop, and modifies behavior based on feedback or self-analysis of past mistakes</td>
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<tr>
<td>▪ Treats unexpected circumstances as opportunities to learn</td>
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<tr>
<th><strong>Participating in Training</strong></th>
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<tr>
<td>▪ Identifies when it is necessary to acquire new knowledge and skills</td>
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<tr>
<td>▪ Takes steps to develop and maintain knowledge, skills, and expertise necessary to achieve positive results</td>
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</tr>
<tr>
<td>▪ Participates fully in relevant training programs and actively pursues other opportunities to develop knowledge and skills</td>
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<tr>
<th><strong>Identifying Career Interests</strong></th>
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<tbody>
<tr>
<td>▪ Takes charge of personal career development by identifying occupational interests, strengths, options and opportunities</td>
<td></td>
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<td>▪ Makes insightful career planning decisions based on integration and consideration of others’ feedback, and seeks out additional training to pursue career goals</td>
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<tr>
<th><strong>Integration and Application</strong></th>
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<tbody>
<tr>
<td>▪ Integrates newly learned knowledge and skills with existing knowledge and skills</td>
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<tr>
<td>▪ Uses newly learned knowledge and skills to complete specific tasks</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Applies</strong> newly learned knowledge and skills in new or unfamiliar situations</td>
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## Tier 2—Academic Competencies

### 1. Communication—Visual and Verbal: Listening, speaking, and signaling so others can understand. Communicate in spoken English well enough to be understood by others.

**Speaking**
- Expresses information to individuals or groups taking into account the audience and the nature of the information (e.g., technical or controversial)
- Speaks clearly and confidently in a logical manner
- Speaks using common English conventions including proper grammar, tone, and pace
- Effectively uses eye contact and non-verbal expression

**Listening and Following Directions**
- Receives, attends to, interprets, understands, and responds to verbal or signaled messages
- Recognizes important information in verbal or signaled messages
- Understands and acts upon instructions to complete assignments

**Communicating Effectively**
- Distinguishes when to use personal vs. business, private vs. public communication styles
- Uses communication tools, such as texting and e-mail, appropriately
- Maintains awareness of the impact of communication

### 2. Reading: Understanding written sentences, paragraphs, and figures in work-related documents.

**Comprehension**
- Locates, understands, and interprets written information in manuals, reports, memos, letters, forms, graphs, charts, tables, calendars, schedules, signs, notices, applications and directions
- Reads and understands 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
- Recognizes and interprets the value of numbers and what they mean to the operation
- Understands the purpose of written materials
- Comprehends meaning and core ideas

**Integration and Application**
- Critically evaluates and analyzes information in written materials
- Integrates and synthesizes information from multiple written materials
3. Locating and Using Information: Functional and critical thinking skills related to information, media, and technology.

**Locate and Write:** Using standard English to compile information and **Evaluate Information**
- Locates, understands, and interprets written information such as manuals, reports, memos, letters, forms, graphs, charts, tables, calendars, schedules, signs, notices, applications, and directions
- Locates information efficiently (time) and effectively (sources)
- Evaluates information critically and competently
- Reviews information obtained for relevance and completeness
- Recognizes important gaps in existing information
- Takes steps to eliminate those gaps

**Use and Manage Information**
- Uses information accurately and creatively for the issue or problem at hand
- Manages the flow of information from a wide variety of sources
- Organizes/reorganizes information as appropriate to get a better understanding of a problem documents.

4. **Writing:** Using standard English to compile information and prepare written documents.

**Organization and Development**
- Creates and formats documents such as letters, directions, manuals, reports, graphs, and flow charts
- Communicates thoughts, ideas, information, messages, and other written information, which may contain technical terms and concepts, in a logical, organized, and coherent manner
- Develops ideas using Ideas are well developed with supporting information and examples

**Mechanics**
- Writes in a manner appropriate for business and with language appropriate for the target audience
- Uses appropriate tone and word choice (e.g., writing is professional and courteous)
- Uses standard syntax and sentence structure
- Uses correct spelling, punctuation, and capitalization
- Uses appropriate grammar (e.g., correct tense, subject-verb agreement, no missing words)

5. **Science, Technology, Engineering, and Math (STEM): Applying**
- Applies basic...
scientific, technological, engineering, and mathematical principles to complete tasks.

### STEM

**Science, Technology, and Engineering**

- Understands basic scientific **concepts and principles** and **how** to use commonly available technology
- Understands the scientific method (i.e., identifies problems, collects information, forms opinions, and draws conclusions)
- Has knowledge of the practical application of **engineering science** and **technology**, and **engineering**
- Applies the appropriate technical solution to complete tasks
- Solves problems where a variety of mechanical faults could be the **cause** of the problem

**Mathematics**

- Translates practical problems into useful mathematical expressions and uses appropriate mathematical formulas and techniques
- Adds, subtracts, multiplies, and divides with whole numbers, fractions, decimals, and **percentages**
- Recognizes and interprets the **value** of numbers and what they mean to the operation
- Calculates averages, ratios, proportions, and rates
- Takes measurement of weight, time, temperature, distance, length, width, height, etc.
- Correctly converts from one measurement to another
- Solves simple algebraic equations
- Reads, tracks, and calculates gauge measurements
- Uses elementary statistics and laws of probability – mean, median, and **mode**

### 4. Communication—Visual & Verbal: Listening, speaking, and signaling so others can understand. Communicate in spoken English well enough to be understood by others.

**Speaking**

- Expresses information to individuals or groups taking into account the audience and the nature of the information (e.g., technical or controversial)
- Speaks clearly and confidently in a logical manner
- Speaks using common English conventions including proper grammar, tone, and pace
- Effectively uses eye contact and non-verbal expression

**Listening and Following Directions**

- Receives, attends to, interprets, understands, and responds to verbal messages
- Picks out important information in verbal messages
- Understands and acts upon instructions to complete assignments
### 65. Critical and Analytical Thinking: Possessing sufficient inductive and deductive reasoning ability to perform job successfully.

**Reasoning**
- Critically reviews, analyzes, synthesizes, compares and interprets information
- Draws conclusions from relevant and/or missing information
  - Applies critical thinking skills to formulate solutions to problems

**Mental Agility**
- Identifies connections between issues
- Quickly understands, orients to, and learns new assignments
  - Demonstrates the ability to multi-task, shifts gears and adjust to changes in direction when working on multiple projects or issues

**Employing Unique Analyses**
- Employs unique analyses and generates new, innovative ideas in complex areas
- Integrates seemingly unrelated information to develop creative solutions
- Develops innovative methods of obtaining or using resources when insufficient resources are available


**General Computer, Software, Information and Communication Technology Knowledge and Skills**
- Demonstrates familiarity with the fundamental capabilities of computers, software, information systems, and communications systems

**Comprehending the Basics**
- Understands terminology and function of common computer, software, information and communication technology devices, components, and concepts
- Understands common terminology related to the use of technology by people with disabilities and/or sensory and functional limitations, including accessible IT, assistive technology, and universal design
- Understands and efficiently uses common basic computer hardware (e.g., desktops, laptops, tablets, PC components, cabling), software (e.g., operating systems; applications; communication, collaboration, and productivity software) and communication devices (e.g., telephony, wireless devices, network and wireless systems) to perform tasks and communicate effectively
- Understands and uses appropriate computer etiquette
- Understands and uses common communications media, including wired and wireless telephones, audio conferences, videoconferences, and online collaboration tools
- Uses a computer to search for online information and interact with Web sites and Web applications (e.g., enterprise solutions, online stores, blogs, social networks, wikis)
- Understands how to critically evaluate online information and be aware of relevant
Copyright and data protection issues

Hardware
Demonstrates a working knowledge of the following computer terms:
- Central processing unit (CPU)
- Memory - random-access memory (RAM) and read-only memory (ROM)
- Storage media (e.g., internal hard disk, external hard disk, network drive, CD, DVD, USB, flash drive, memory card)
- Input/output ports, (e.g., USB, serial, parallel, network port, FireWire)
- Input devices (e.g., mouse, keyboard, trackball, scanner, touchpad, stylus, joystick, Web camera, digital camera, microphone, voice recognition, remote control, and head, mouth, and eye operated controllers)
- Output devices (e.g., screens/monitors, PCs, printers, speakers, headphones)
- Assistive technology devices (e.g., voice recognition software, screen reader, screen magnifier, on-screen keyboard, closed captioning, text-to-speech)

Common IT Applications Use
- Uses spreadsheet, database, and presentation software both independently and in an integrated fashion (software) to perform tasks
- Manages file storage: uses functions to store, retrieve, and sort documents
- Understands social media and their appropriate workplace uses
- Double-Understands common computer terminology (e.g., program, operating system) and is familiar with the fundamental capabilities of computers
- Is comfortable and proficient with a computer

Keyboarding and Word Processing
- Enters data into computer files quickly, with an acceptable degree of accuracy
- Uses word processing software to create, edit, and retrieve document files
- Uses basic reference materials and tools (e.g., spell check) to ensure accuracy
- Checks work carefully to identify and correct or delete errors and/or missing information
- Is proficient in Microsoft Word
Spreadsheets
- Uses spreadsheet software to enter, manipulate, edit and format text and numerical data
- Effectively creates and saves worksheets, charts, and graphs that are well organized, attractive, and useful
- Is proficient in Microsoft Excel

Internet Applications
Cyber Safety
- Uses the internet and web-based tools to manage basic workplace tasks (e.g., timekeeping, maintaining employee records, conducting information searches)
- Is aware of company guidelines surrounding internet usage and complies with those guidelines

E-mailing
- Understands the importance of privacy and potential abuses of private information
- Is able to stay safe in an online, networked environment
- Understands the importance of updating and company e-mail system and its basic functions (e.g., replying to/forwarding messages, using the most recent security software, Web browser, and operating system to protect against malware, and other online threats such as electronic address books, attaching files)
- Recognizes and responds appropriately to suspicious vulnerabilities and threats: Web sites, Web links, emails, posts, online advertisements, phishing, virus infections, etc.
- Recognizes secure Web addresses, (e.g., “https://” or “shttp://”)
- Protects and manages personally identifiable information
- Understands and uses privacy and security settings on social networking applications to share only appropriate personal information
- Reviews the privacy policy and understands what data (location, access to social networks) an application can access prior to downloading and installing
- Understands the risk of connecting to an unsecured or unprotected network
- Uses strong passwords, passphrases, and basic encryption
- Composes professional e-mails to communicate business-related information to coworkers, colleagues, and customers
- Ensures that key stakeholders are kept informed of communications by copying (i.e., “CCing”) them on important e-mails when appropriate
# Tier 3—Workplace Competencies

## 1. Teamwork: Working cooperatively with others to complete work assignments.

<table>
<thead>
<tr>
<th>Working with Others</th>
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<tbody>
<tr>
<td>Demonstrates the ability to work responsibly on a team</td>
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<tr>
<td>Recognizes the importance of teamwork and its contribution to success and impact on business</td>
</tr>
<tr>
<td>Assists others who have less experience or have heavy workloads</td>
</tr>
<tr>
<td>Identifies and draws upon team members’ individual strengths and weaknesses to achieve results</td>
</tr>
<tr>
<td>Learns from other team members</td>
</tr>
<tr>
<td>Determines when to be a leader and when to be a follower depending on what is needed to achieve the team’s goals and objectives</td>
</tr>
<tr>
<td>Uses a group approach to identify problems and develop solutions based on group consensus</td>
</tr>
<tr>
<td>Effectively communicates with all members of the group or team to achieve team goals and objectives</td>
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<table>
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<tr>
<th>Resolving Conflicts</th>
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<tbody>
<tr>
<td>Delivers constructive criticism and voices objections to others’ ideas and opinions in a constructive, supportive, and non-accusatory manner</td>
</tr>
<tr>
<td>Handles conflicts maturely by exercising “give and take” to achieve positive results for all parties</td>
</tr>
<tr>
<td>Exhibits tact and diplomacy and strives to build consensus</td>
</tr>
<tr>
<td>Brings others together to reconcile differences to maintain a smooth workflow</td>
</tr>
<tr>
<td>Reaches formal or informal agreements that promote mutual goals and interests, and obtains commitment to those agreements from individuals or groups</td>
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</table>

## 2. Customer Focus: Efficiently and effectively addressing the needs of clients/customers.

<table>
<thead>
<tr>
<th>Providing Personalized Service</th>
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<tbody>
<tr>
<td>Actively listens to customers to understand customer needs and goals</td>
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<tr>
<td>Provides prompt, efficient, and personalized assistance to meet the requirements, requests, and concerns of customers</td>
</tr>
<tr>
<td>Provides thorough, accurate information to answer customers’ questions and informs them of commitment times or performance guarantees</td>
</tr>
<tr>
<td>Actively looks for ways to help customers by identifying and proposing appropriate solutions and/or services</td>
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<table>
<thead>
<tr>
<th>Acting Professionally</th>
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<tbody>
<tr>
<td>Is pleasant, courteous, and professional when dealing with internal or external customers</td>
</tr>
<tr>
<td>Develops constructive and cooperative working relationships with customers, and displays...</td>
</tr>
</tbody>
</table>
a good-natured, cooperative attitude
- Is calm and empathetic when dealing with difficult customers

**Keeping Customers Informed**
- Follows up with both internal and external customers during projects and following project completion
- Keeps clients up to date about decisions that affect them
- Seeks the comments, criticisms, and involvement of customers
- Adjusts services based on customer feedback

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**3. Planning and Organizing:** Planning and prioritizing work to manage time effectively and accomplish assigned tasks.

<table>
<thead>
<tr>
<th>Planning</th>
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<tbody>
<tr>
<td>Approaches work in a methodical manner</td>
</tr>
<tr>
<td>Plans and schedules tasks so that work is completed on time</td>
</tr>
<tr>
<td>Keeps track of details to ensure work is performed accurately and completely</td>
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<table>
<thead>
<tr>
<th>Prioritizing</th>
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<tbody>
<tr>
<td>Prioritizes various competing tasks and performs them quickly and efficiently according to their urgency</td>
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<tr>
<td>Finds new ways of organizing work area or planning work to accomplish work more efficiently</td>
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<table>
<thead>
<tr>
<th>Allocating Resources</th>
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<tbody>
<tr>
<td>Estimates resources needed for project completion</td>
</tr>
<tr>
<td>Shows proper technique for forecasting accurately, both short term and long term</td>
</tr>
<tr>
<td>Allocates time and resources effectively and coordinates efforts with all affected parties</td>
</tr>
<tr>
<td>Keeps all parties informed of progress and all relevant changes to project timelines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anticipating Obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipates obstacles to project completion and develops contingency plans to address them</td>
</tr>
<tr>
<td>Takes necessary corrective action when projects go off-track</td>
</tr>
</tbody>
</table>

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**4. Problem Solving and Decision Making:** Applying critical-thinking skills to solve problems encountered on the work site.

<table>
<thead>
<tr>
<th>Identifying the Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipates or recognizes the existence of a problem</td>
</tr>
<tr>
<td>Identifies the true nature of the problem by analyzing its component parts</td>
</tr>
<tr>
<td>Recalls previously learned information that is relevant to the problem</td>
</tr>
</tbody>
</table>

| Locating, Gathering, and Organizing Relevant Information |
Effectively uses both internal resources (e.g., internal computer networks, company filing systems) and external resources (e.g., internet search engines) to locate and gather information relevant to the problem
- Examines information obtained for relevance and completeness
- Recognizes important gaps in existing information and takes steps to eliminate those gaps

**Generating Alternatives**
- Integrates previously learned and externally obtained information to generate a variety of high-quality alternative approaches to the problem
- Uses logic and analysis to identify the strengths and weaknesses, the costs and benefits, and the short- and long-term consequences of different approaches

**Choosing a Solution**
- Decisively chooses the best solution after contemplating and evaluating available approaches to the problem
- Makes difficult decisions even in highly ambiguous or ill-defined situations
- Quickly chooses an effective solution without assistance when appropriate

**Implementing the Solution**
- Commits to a solution in a timely manner, and develops a realistic approach for implementing the chosen solution
- Observes and evaluates the outcomes of implementing the solution to assess the need for alternative approaches and to identify lessons learned

5. **Working with Tools and Technology**: Selecting, using, and maintaining tools and technology to facilitate work activity.

**Selecting and Using Tools**
- Identifies, selects, and applies appropriate tools or technological solutions to frequently encountered problems
- Carefully considers which tools or technological solutions are appropriate for a given job, and consistently chooses the best tool or technological solution for the problem at hand
- Demonstrates appropriate use of basic hand tools and technology 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 system (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 (PPE)
- Uses tool, equipment, and machinery safely and appropriately

**Keeping Current**
- Demonstrates an interest in learning about new and emerging tools and technologies
- Seeks out opportunities to improve knowledge of tools and technologies that may assist in streamlining work and improving productivity
  - Adapts quickly to changes in process or technology
  - Accepts help from others

**Troubleshooting**
- Learns how to maintain and troubleshoot tools and technologies
- Performs routine maintenance on tools, technology, and equipment
- Determines causes of operating errors and decides what to do about it
- Troubleshoots maintenance problems in accordance with established procedures
  - Develops alternatives to complete a task if desired tool/technology is unavailable

6. **Scheduling and Coordinating:** Making arrangements (e.g., for transportation and distribution of goods) that fulfill all requirements as efficiently and economically as possible.

**Arranging and Informing**
- Handles all aspects of arrangements thoroughly and completely with little or no supervision
- Informs others of arrangements, giving them complete, accurate, and timely information
- Responds to the schedules of others affected by arrangements
  - Ensures that others receive needed materials in time
- Takes steps to verify all arrangements
- Recognizes problems, generates effective alternatives, and takes corrective action

**Coordinating in Distributed Environments**
- Coordinates schedules of colleagues, co-workers, and clients in regional locations (i.e., across time zones) to ensure that inconvenience is minimized and productivity is enhanced
- Leverages technology (e.g., internet, teleconference) to facilitate information sharing in distributed work environments
- Takes advantage of team member availability throughout business hours in multiple time zones to enhance productivity

**Shift Work**
- Effectively coordinates the transition of employees at the beginning and end of each work shift
- Disseminates crucial information in an organized manner to rapidly bring employees up to speed at the start of their shifts
- Ensures that employees are updated on work completed on past shifts and work that still needs to be completed
  - Demonstrates willingness to work various shifts and schedules

7. **Checking, Examining, and Recording:** Entering, transcribing, recording, storing, or
maintaining information in written or electronic format.

### Completing Forms
- Selects and completes appropriate forms quickly and completely
- Attends to and follows through on important information in paperwork
- Forwards or processes forms in a timely and accurate manner
- Expedites forms, orders, or advances that require immediate attention
- Obtains appropriate information, signatures, and approvals promptly

### Maintaining Logs
- Keeps logs, records, and files that are up-to-date and readily accessible (e.g., driver logs, flight records, repair records)
- Updates logs, files, and records, noting important changes in status

### Detecting Errors
- Verifies that all information is present and accurate before forwarding materials
- Detects and corrects errors, even under time pressure
- Compares shipment contents to records/verifies cargo against shipping papers
- Notices errors or inconsistencies

### 8. Business Fundamentals: Application of basic business and management principles to connect industry trends with services the company sells and provides to the customer.

#### Situational Awareness
- Understands the mission, structure, and functions of the TDL organization
- Understands and explains the impact of economic, social, and technological changes on the TDL organization
- Recognizes one’s role in the functioning of the company and understands the potential impact one’s own performance can have on the success of the organization
- Grasps the potential impact of the company’s well-being on employees

  - Understands the culture of safety and practices safe work habits.

#### Physical Aptitude
- Recognizes the physical aptitudes necessary to perform critical work functions
- Demonstrates sufficient stamina to complete critical work functions (e.g., complete full shift, walking, carrying heavy objects for extended periods)

#### Business Ethics
- Demonstrates respect for coworkers, colleagues, and customers
- Acts in the best interest of the company, the community, and the environment
- Complies with applicable laws and rules governing work and reports loss, waste, or theft or company property to appropriate personnel

#### Industry Market Knowledge
**Private Sector**
- Understands the **industry, industry** market trends, in the industry and the company’s position in the market
- Knows who the company’s primary competitors are, their products/services, strengths/weaknesses, and, to the extent possible, and stays current on organizational strategies to maintain competitiveness
- UnderstandsKnows the company’s priorities, workforce capabilities, strategic plan, business plan, critical customers, suppliers, and stakeholders
- Has foundational knowledge of distribution and logistics and understands its scope and impact on the economy
- Understands major competitive challenges faced by the TDL-organization/industry

**Public Sector**
- Understands the industry and the organization’s mission in support of industry success
- Knows the agency’s key stakeholder roles and priorities, and stays current on key organizational strategies
- Understands major challenges faced by the organization and industry, and key strategies to address challenges
### Tier 4—Industry-Wide Technical Competencies

<table>
<thead>
<tr>
<th>Critical Work Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ <strong>Understands</strong> the nature and scope of multidimensional impact of transportation, distribution, and logistics.</td>
</tr>
<tr>
<td>▪ Describes the various modes of transportation and their inter-connectivity.</td>
</tr>
<tr>
<td>▪ Explains the role and impact of the transportation of passengers and freight on the economy.</td>
</tr>
<tr>
<td>▪ Understands the public and private organizations, systems, national and local infrastructure supporting the transportation, distribution, and logistics industry, and the environment.</td>
</tr>
<tr>
<td>▪ Understands and evaluates the transportation systems’ political, regulatory, and legal issues.</td>
</tr>
<tr>
<td>▪ Describes and assesses the strengths and weaknesses of the major modes of international transportation.</td>
</tr>
<tr>
<td>▪ Applies systems analysis to the elements, relationships, and functions in the supply chain.</td>
</tr>
<tr>
<td>▪ Develops plans including routes and schedules for transporting people and goods.</td>
</tr>
<tr>
<td>▪ Adjusts transportation and distribution plans in response to changing conditions.</td>
</tr>
<tr>
<td>▪ Implements security measures to minimize loss.</td>
</tr>
<tr>
<td>▪ Ensures that cargo arrives at the right location, on time, and in the safest, most economical manner.</td>
</tr>
<tr>
<td>▪ Maintains information on the movement of people/goods according to planned routes and schedules.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical Content Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning</strong></td>
</tr>
<tr>
<td>▪ Forecasting</td>
</tr>
<tr>
<td>▪ <strong>Contracting</strong></td>
</tr>
<tr>
<td>▪ Risk factors</td>
</tr>
<tr>
<td>▪ Scheduling and monitoring</td>
</tr>
<tr>
<td>▪ <strong>Security</strong></td>
</tr>
<tr>
<td>▪ Documentation</td>
</tr>
</tbody>
</table>

| Modes of Transportation |
- Air
- Rail
- Maritime
- Highway
- Pipeline
- Public Transit and Ground Transportation Systems

Intermodal and Multimodal Schedules
- Local Delivery
- Long Distance
- Special Handling
- Hazardous Materials
- Scenic and Sightseeing Transportation (NAICS 487), the Postal Service (NAICS 491), and Couriers and Messengers (NAICS 492)

Support Providers
- Logistics
- Supply Chain Management
- Transportation Management
- Warehousing Management
- Infrastructure Management
- Non-Asset Based Third Party Suppliers for activities such as:
  - Auditing
  - Customer Service Issue Resolution
  - Freight Quoting
  - Financial Settlement and Invoicing
  - Packaging and Transportation

2. Design and Development: Activities related to the research, design, and development operation of transportation systems capable of moving materials, products, and people to meet customer’s requirements and distribution facilities including ports, terminals, and warehouses.

Critical Work Functions:
- Develops plans that describe warehousing as part of the total supply chain process
- Processes incoming products including routes, unloading, receiving, checking, marking/identification and schedules for transporting people to storage, pick-up areas, work stations, or outbound staging areas and goods to meet customer requirements
- Analyzes performance of transportation operations in storing products for order to improve quality and service levels and increase efficiency
- Applies systems analysis to the elements, relationships, and processes of outbound shipments

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1 See page 32-33 for systems and modes within this category.
including order picking, sorting and functions in the supply chain

- Determines customer needs, checking, packaging, sealing, weighing, and requirements
- Ensures that passengers or cargo arrive at the right location, on time, manifesting, and in the safest loading and most efficient load balancing and economical manner within regulatory guidelines shipping
- Maintains information on the movement of people and goods according to planned routes and schedules
- Assesses infrastructure conditions and develops plans to maintain and improve transportation infrastructure
- Completes shipping papers and other appropriate labels and documentation
- Recognizes and identifies proper marking, labeling, and placarding
- Ships products on time and in the most cost-effective manner
- Tracks, sorts, labels, and load cargo accurately and safely
- Traces lost shipments and maintains loss and damage claim records

**Technical Content Areas:**

**Design and Development**
- Asset Management
- Geometric Design
- Intelligent Transportation Systems
- Pavements
- Roads and Bridges

**Traffic Warehouse Operations**
- Shipping and receiving
- Packaging
- Product stacking requirements
- Security and loss prevention systems
- Warehouse records and Capacity documentation
- Traffic Safety
- Transportation Planning Development
- User Behavior/Human Factors

**Business Cycle**
- Automated material handling systems
- Distribution Contracting
- Documentation
- Forecasting
- Procurement
- Scheduling and Monitoring information systems
<table>
<thead>
<tr>
<th>Global Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bar-coding, racking, labeling, and cross-docking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Chain Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Supply chain elements</td>
</tr>
<tr>
<td>• Inventory management</td>
</tr>
<tr>
<td>• Customs and export control (Legal Aspects)</td>
</tr>
<tr>
<td>• Global Logistics outsourcing</td>
</tr>
<tr>
<td>• Supply Chain Logistics Life Cycle</td>
</tr>
<tr>
<td>• Intellectual Property</td>
</tr>
<tr>
<td>• Political Climates</td>
</tr>
<tr>
<td>• Taxes and Duties</td>
</tr>
<tr>
<td>• Shipping, Receiving, and Freight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Transportation Operations and Management &amp; Maintenance: Activities related to the implementation, management movement of people, materials, and products by road, air, rail, and control of transportation systems, water</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Critical Work Functions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Explains the role of transportation in the economy, the demand for transportation, and the role of government in regulating the industry</td>
</tr>
<tr>
<td>• Drives or operates transportation equipment</td>
</tr>
<tr>
<td>• Maintains and repairs transportation equipment</td>
</tr>
<tr>
<td>• Dispatches or coordinates schedules of transportation equipment</td>
</tr>
<tr>
<td>• Implements transportation plans and schedules</td>
</tr>
<tr>
<td>• Adjusts transportation and distribution processes in response to changing conditions</td>
</tr>
<tr>
<td>• Demonstrates knowledge understanding of roadway planning, design, and construction, and vehicle activities related to dispatching, routing, and tracking transportation vehicles</td>
</tr>
<tr>
<td>• Applies strategies for managing traffic flow at transportation hubs, facilities, Recognizes universal signs and symbols such as colors, flags, stakes to function safely in the workplace</td>
</tr>
<tr>
<td>• Signals and observes directions or warnings to and from coworkers</td>
</tr>
<tr>
<td>• Examines vehicles to detect malfunctions, damage, or maintenance needed</td>
</tr>
<tr>
<td>• Updates maintenance records and staging areas</td>
</tr>
<tr>
<td>• Applies industry standards to ensure quality service</td>
</tr>
<tr>
<td>• Maintains logs according to company policies and other required documents</td>
</tr>
<tr>
<td>• Monitors processes to ensure they are appropriate procedures and effective government regulations</td>
</tr>
<tr>
<td>• Ensures equipment is operating to prescribed standards</td>
</tr>
<tr>
<td>• Raises and reports quality issues in a timely manner</td>
</tr>
<tr>
<td>• Suggests and/or implements continuous improvement actions such as business process reengineering and performance improvement strategies</td>
</tr>
</tbody>
</table>
- Provides ongoing customer service to both internal and external customers
- Responds to customer problems, complaints, and questions

Technical Content Areas:

Modes of Transportation

- Air Transportation — transportation of passengers and/or cargo using aircraft, such as airplanes and helicopters
- Rail Transportation — transportation of passengers and/or cargo using railroad rolling stock
- Water Transportation — transportation of passengers and cargo using watercraft, such as ships, barges, and boats
- Truck Transportation — over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers
  - General freight transportation — handles a wide variety of general commodities, generally palletized, and transported in a container or van trailer
  - Specialized freight transportation — transportation of cargo that require specialized equipment due to inherent characteristics (size, weight, shape)
- Public transportation infrastructure (e.g., highways, airports, train terminals, ports, commercial space launching facilities, inter-modal facilities)
- Intermodal Transportation — transportation of passengers or freight using multiple modes of transportation

Operation

- Traffic flow: hubs, facilities, staging areas
- Transportation routes and schedules
- Dispatch
  - Intermodal Transfers/Synchronization
  - Impact of Intermodal Operations
  - Operations Systems
- Signaling
- Scheduling
- Tracking

Maintenance

- Equipment operation
- Equipment/machinery maintenance services
  - Traffic Flow
  - Vehicle Operation

Customer Relationship Management
- Internal Maintenance plans and External Customers schedules
- Maintenance logs
  - Company Policies and Procedures
  - Confidentiality
  - Handling Questions, Problems, Complaints
  - Educating the Customer
  - Customer Satisfaction and Commitment to Product or Service

**Routes and Schedules**
- Local
- Long-Distance
- Special Handling
- Hazardous Materials

**Quality Assurance**
- Total Quality Management (TQM)
- Enterprise Lean
- Six Sigma Methodology

### 4. Maintenance Technology Applications:
Maintaining awareness of technological advances and Repair: Activities related to applying appropriate technology to the maintenance and repair of transportation facilities, equipment, infrastructure, and systems, distribution, and logistics processes.

**Critical Work Functions:**
- Examines or inspects facilities, equipment, infrastructure, and systems to detect malfunctions, damage, or maintenance needed
- Maintains and repairs transportation facilities, equipment, infrastructure, and systems
- Updates maintenance records and logs according to company policies and procedures and government regulations
- Stays informed of technological advances that impact TDL activities
- Awareness of the benefits associated with implementing new technologies
- Application or use of various technologies that impact TDL activities

**Technical Content Areas:**
- Information
- Maintenance
  - Equipment operation and Repair
  - Equipment/machinery maintenance services
  - Maintenance Schedules
  - Maintenance logs
Repair
- Repair Schedules

Vehicle Diagnostic Systems
- Geographic Information Systems (GIS)
- Electronic Data Interchange (EDI)
- Global Logistics Systems (GLS)
- Intelligent Transportation Systems (ITS)
- Advanced Traveler Information Systems (ATIS)
- Transportation Management Systems (TMS)
- Warehouse Management Systems (WMS)
- Vehicle Monitoring Systems (VMS)

Technology
- Radio Frequency Identification (RFID)
- AutoID Technologies
- Materials handling technologies (e.g., voice-directed order picking technology)

5. Technology Applications: Maintaining an awareness of technological advances

Regulations & Quality Assurance: Compliance with relevant local, state, federal, and applying appropriate technology to international laws and regulations that impact the transportation, distribution, and logistics processes in the industry. Application of industry standards to ensure quality service.

Critical Work Functions:
- Understands the roles and functions of government agencies (e.g., Federal Aviation Administration) in regulating and supporting TDL organizations
- Complies with local, state, federal, and international laws
- Maintains logs and other required documents
- Monitors processes to ensure they are effective
- Inspects facilities or equipment for regulatory compliance
- Ensures materials and processes meet quality specifications
- Ensures equipment is operating to prescribed standards
- Raises and reports quality issues in a timely manner
- Suggests and/or implements continuous improvement actions such as business process reengineering and performance improvement strategies
- Applies new and emerging advanced techniques to provide solutions for transportation, distribution, and logistics problems
- Stays informed of technological advances and the benefits of applying appropriate
Technology to transportation, distribution, and logistics processes

**Technical Content Areas:**

**Standards**
- International Organization for Standardization (ISO) standards
- Tariff and trade regulations
- Labeling regulations
- Environmental regulations
- OSHA regulations

**Quality Assurance**

**Total Quality Technology**
- Transportation Components and Systems such as vehicular global positioning systems, or vehicle navigation systems
- Transportation Services Equipment such as integrated maintenance information systems
- Communications Devices and Accessories such as mobile phones, or two-way radios
- Computer Equipment and Accessories such as notebook computers, personal digital assistants (PDAs) or organizers, thin-client computers, desktop computers, personal computers, wearable computing devices, bar code reader equipment, radio frequency identification devices, scanners, touchpads, portable data input terminals
- Data Voice or Multimedia Network Equipment or Platforms and Accessories such as automatic call distributor (ACD), interactive voice recognition equipment, intercom systems, radio frequency data communication equipment, telegraph sounders, instant messaging platform, location based messaging service platforms, paging controllers
- Robotics
- Public Safety and Control Systems
- Fire Protection such as fire suppression systems
- Consumer Electronics such as global positioning system receivers, radio frequency scanners, radio frequency transmitters or receivers

**Systems and Software**
- Advanced Traveler Information Systems (ATIS)
- Compliance
  - Customer Relationship Management (CRMTQM)
- Electronic Data Interchange (EDI)
- Electronic Logging Systems
  - Enterprise Resource Planning (ERP) Lean
- Expert Systems
- Facilities Management
Six Sigma methodology
- Geographic Information Systems (GIS)
  - Global Logistics Systems (GLS)
  - Industrial Control
- Intelligent Transportation Systems (ITS)
  - Materials Requirements Planning Logistics and Supply Chain
  - Mobile Location-based Services
- Procurement
- Project Management
- Route Navigation
- Transportation Management Systems (TMS)
  - Safety and Security Systems
  - Video Monitoring Systems

6. Regulations: Compliance with relevant local, state, federal, and international laws and regulations that impact the transportation, distribution, and logistics industry.

Customer Relationship Management: Marketing/selling transportation services and providing customer service to consumers of transportation services.

Critical Work Functions:
- Understands the roles and functions of government agencies (e.g., Federal Aviation Administration) in regulating services
- Sells logistics and supporting transportation, distribution, products and logistics organizations/services
- Determines customer needs and requirements
- Processes customer orders and purchases
- Greets customers, guests, visitors, or passengers in a professional manner
- Provides ongoing customer service to both internal and external customers
- Responds to customer problems, complaints, and questions
- Tracks status of customer orders/purchases
- Complies with local, state, federal, and international laws and regulations
- Understands transportation systems’ political, regulatory, and legal issues
- Identifies governmental policies and procedures for transportation, distribution arrangements, and logistics facilities
- Schedules

Technical Content Areas:
**Sales & Marketing Operations**
- Economic/market trends
- Competition

Transportation, distribution Standards and Regulations
- Logistics products International Organization for Standardization (ISO) standards
Tariff and Trade Regulations
- Labeling Regulations
- Environmental Regulations
- Safety Regulations, Including Occupational Safety and Health Administration (OSHA)
- Local, State, Federal, and International Laws
- Sales/marketing plans
- Sales/order documentation

Customer Service
- Internal and external customers
- Company policies and procedures
- Confidentiality
- Handling questions, problems, complaints
- Educating the customer
- Customer satisfaction and commitment to product or service


Critical Work Functions:
- Takes measures to protect public health and safety
- Understands and follows relevant safety rules, regulations, and laws
- Follows organizational policies and procedures to maintain a safe work area
- Identifies and describes workplace hazards
- Uses appropriate personal protective equipment (PPE) as appropriate
- Follows emergency procedures
  - Recognizes universal signs and symbols, such as colors, flags, and stakes, to function safely in the workplace
- Completes safety training on pertinent equipment and applies safe operating procedures
- Correctly identifies hazardous materials and substances
- Handles/transport hazardous materials in accordance with government regulations and health standards
- Reports health, safety, security, and environmental problems
- Maintains documentation of compliance with health, safety, security, and environmental management systems
- Stays up to date on environmentally friendly trends in the industry
  - Understands and follows the safety and security rules and procedures particular to employee’s mode and occupation
  - Implements security measures to minimize loss and disruption
- Practices sustainability by using processes that are non-polluting, conserving of energy and natural resources, economically efficient, and safe for workers, communities, and consumers
• Stays up to date on environmentally-friendly trends in the industry
• Follows organizational procedures to reduce emissions, increase energy efficiency, and reduce the organization’s carbon footprint

### Technical Content Areas:

#### Rules and Regulations
- Safety, Health, Environmental, and Operational Regulations
- OSHA regulations
- HAZMAT regulations
- Personal Protective Equipment (PPE)
- Health, safety, and environmental risks

#### Safety
- Protective Gear
- Safety Practices
- Workplace Hazards
- Emergency Preparedness
- Investigations and Audits
- Documentation

#### Security
- Continuity of Operations
- Cybersecurity
- Emergency Preparedness
- Infrastructure and Physical Security
- Internal Controls
- Risk Management
- Vulnerability Assessment

#### Environmental Concerns
- Hazardous Materials
- Green issues impacting Transportation, Distribution, and Logistics (TDL) industry
  - Greenhouse gas emissions
  - Energy efficiency
  - Carbon footprint
  - Fuel-saving technologies
  - Air/water quality

#### Safety Procedures
- Protective Gear
- Safety Practices
- Workplace Hazards
- Emergency Preparedness
- Investigations and Audits
- Documentation
Tier 5—Transportation Sectors

For each sector, key concepts and a sample of related occupations are provided to demonstrate how the Transportation, Distribution, and Logistics Competency Model serves as a foundational resource for all of the sectors. While it is beyond the scope of this project to develop competencies for Tier 5 Transportation sectors, the sector competencies may be built out by their respective associations or communities of practice. The occupation lists that follow were developed using the developed by the Bureau of Labor Statistics. Occupations use titles.

1. Air Transportation: The activities required to provide for the air transportation of passengers and/or cargo using aircraft such as airplanes and helicopters. Includes both scheduled and non-scheduled carriers.

**Types of Civil Aviation**
- Scheduled Air Transport (all passenger and cargo flights operating on regularly scheduled routes)
- General Aviation (GA) (all other civil flights, private or commercial)

**Major Components**
- Air Traffic Management
- Aircraft Design, Development, and Production
- Airport Operations and Management
- Airworthiness Certification
- Aviation System Planning and Engineering
- Economics
- Flight Operations
- Manufacturers and Suppliers
- Medical
- Personnel Licensing
- Regulation
- Repair and Maintenance
- Safety, Security, and Environmental Impacts
- Training

**Major Workforce Categories**

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2 For each NAICS industry sector, a table was downloaded from Industry-occupation matrix data, by industry showing employment in that sector by occupation. Each table was sorted by Percent of Industry to create a ranking of occupations. Occupations selected represent a substantial portion of employment for that sector, or greater than ~2.0% of industry employment. Each list is presented in alphabetical order.

3 See the Aerospace Competency Model and the Aerospace and Defense Manufacturing Competency Model.
Employment and Training Administration

United States Department of Labor

www.doleta.gov

- Airline Employees
- Airport Employees
- Federal Aviation Administration (FAA) Employees
- State and Local Government Aviation Employees
- Airport Support Employees (not at airports, but aligned with the U.S. aviation industry)

**Major Job Types**
- Pilots
- Other Flight Personnel
- Passenger Handling and Services
- Maintenance
- Air Traffic Handling and Control
- Cargo Handling
- Professional and Other Transport Related

**Key Trends**
- Commercial Space Transportation
- Next Generation Air Transportation System (NextGen)
- Unmanned Aerial Systems

**Occupations**
- Aerospace Engineering and Operations Technicians
- Air Traffic Controllers
- Aircraft Cargo Handling Supervisors
- Aircraft Mechanics and Service Technicians
- Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
- Airfield Operations Specialists
- Airline Pilots, Copilots, and Flight Engineers
- Aviation Inspectors
- Avionics Technicians
- Baggage Porters and Bellhops
- Cargo and Freight Agents
- Commercial Pilots
- Customer Service Representatives
- Flight Attendants
- Laborers and Freight, Stock, and Material Movers, Hand
- Reservation and Transportation Ticket Agents and Travel Clerks

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4 “Major Workforce Categories” and “Major Job Types” adapted from *Aviation Industry Modal Profile: An Overview of Aviation Industry Workforce Trends, Challenges, and Opportunities*, U.S. Department of Transportation.
2. Rail Transportation: The activities required to provide rail transportation of passengers and/or cargo using railroad rolling stock.

Types of Rail -- Passenger and Freight
- Class I
- Regional
- Short Line
- Intercity Passenger Rail and Commuter Rail

Major Components
- Rolling Stock (the Locomotives, Passenger Coaches, Freight Cars, etc.)
- Infrastructure (the Roadbed, Tracks, Switches, Stations, Freight Facilities, Viaducts, Tunnels, etc.)
- Passenger and Freight Operations
- Maintenance
- Signaling and Communications
- Inspection
- Safety
- Advanced Train Control Systems
- Hazardous Materials

Major Workforce Categories
- Executives, Officials, and Staff Assistants - Positions for the executive and senior management of the firm. Corporate Officers, and other appointed or elected corporate officials.
- Professionals and Administrative - Positions ranging anywhere from an internal auditor, attorney or secretary, to information technology specialist.
- Maintenance-of-Way and Structures - Provide quality maintenance to the track, train control (signals and communication) systems, bridges, and buildings.
- Maintenance of Equipment and Stores - Provide a number of support jobs throughout the railroad with different titles, working in different departments. May work in the yard office, towers, mechanical shops, and other various office locations.
- Transportation, Train and Engine - Responsible for the safe and efficient operation of trains and the movement of customer freight from one destination to another.
- Transportation, Other Than Train and Engine - Inspects, repairs, and maintains freight

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5 See also Public Transportation on page 30. Some rail services could be classified in both the rail and public transportation sectors.
cars and locomotives. This function is also responsible for clearing derailments involving railroad equipment. Mechanical experience, additional training is often required on-the-job.

**Key Trends**
- High-Speed Rail
- Positive Train Control (PTC)
- Green Rail Initiatives

**Occupations**
- Locomotive Engineers
- Rail Car and Locomotive Repairers
- Rail Transportation Workers, All Other
- Rail Yard Engineers and Hostlers
- Railroad Traffic Control Dispatchers
- Railroad Conductors and Yardmasters
- Railroad Track/Bridge/Building Maintenance, Inspection, Construction, and Repair Workers
- Signals and Electronics Installation, Inspection, Testing, and Repair Workers
- Transit and Railroad Police
- Laborers

**3. Maritime Transportation: The activities required to provide for the water transportation of passengers and cargo using watercraft such as ships, barges, and boats. Includes both deep sea and inland waterway.**

**Transportation – Freight and Passenger**
- Deep Sea
  - Coastal and Great Lakes
  - Inland

**Ship Departments**
- Deck Department
- Engineering Department
- Steward's Department
- Other Departments

**Support and Infrastructure**
- Port Management and Logistics
  - Cargo Loading and Unloading

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Occupations

- Bridge and Lock Tenders
- Commercial Divers
- Marine Architects
- Marine Engineers
- Mates - Ship, Boat, and Barge
- Motorboat Mechanics and Service Technicians
- Motorboat Operators
- Pilots, Ship
- Reservation and Transportation Ticket Agents and Travel Clerks
- Sailors and Marine Oilers
- Ship and Boat Captains
- Ship Engineers

4. Highway Transportation: The activities required to provide over-the-road transportation of cargo using motor vehicles such as trucks and tractor-trailers. Includes both generalized and special freight trucking.¶

General Freight

- Equipment
- Load Carried
- Scheduling
- Terminal Services
- Networking Services

Mode of Commodities

- Palletized
- Container
- Intermodal
- Van Trailer

¶ See also the Heavy Highway Civil Construction Competency Model.
Specialized Freight
- Size
- Weight
- Shape
- Hazardous Materials

Support Activities for Road Transportation
- Motor Vehicle Towing
- Freight Transportation Arrangement
- Packing and Crating

Transportation Performance Management
- National Highway Performance Program (NHPP)
- Highway Safety Improvement Program (HSIP)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Freight Movement

Technology
- Automated Traction Control
- Operator Monitoring Systems

Occupations
- Bus and Truck Mechanics and Diesel Engine Specialists
- Dispatchers, Except Police, Fire, and Ambulance
- First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators
- Heavy and Tractor-Trailer Truck Drivers
- Industrial Truck and Tractor Operators
- Laborers and Freight, Stock, and Material Movers, Hand
- Light Truck or Delivery Services Drivers
- Transportation, Storage, and Distribution Managers

5. Public Transit and Ground Transportation Systems: The activities required to provide passenger transportation through a variety of means such as urban transit systems; chartered bus, school bus, and interurban bus transportation; and taxis.

Systems
- Urban Transit Systems (NAICS 4851)
- Interurban and Rural Bus Transportation (NAICS 4852)
- Taxi and Limousine Service (NAICS 4853)
- School and Employee Bus Transportation (NAICS 4854)
- Charter Bus Industry (NAICS 4855)
- Other Transit and Ground Passenger Transportation (NAICS 4859)

**Modes**
- Aerial Tramway
- Automated Guideway Transit
- Bus
- Cable Car
- Commuter Rail
- Ferry Boat
- Heavy Rail
- Inclined Plane
- Light Rail
- Monorail
- Paratransit
- Trolleybus
- Vanpool

**Workforce Functional Areas**
- Vehicle Operations
- Vehicle Maintenance
- Facilities, Track, and Road Maintenance
- Administration, Planning, and Scheduling

**Focus Areas**
- Safety
- Security
- Sustainability

**Occupations**
- Bus and Truck Mechanics and Diesel Engine Specialists
- Bus Drivers, School or Special Client
- Bus Drivers, Transit and Intercity
- Cleaners of Vehicles and Equipment
- Dispatchers, Except Police, Fire, and Ambulance
- First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators

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- Office Clerks, General
- Reservation and Transportation Ticket Agents and Travel Clerks
- Subway and Streetcar Operators
- Taxi Drivers and Chauffeurs
- Transportation Attendants, Except Flight Attendants

### 6. Warehousing: The activities required for the operation of warehousing and storage facilities for general merchandise, refrigerated goods, and other warehouse products.

#### Storage of Goods
- General Warehousing and Storage
- Refrigerated Warehousing and Storage
- Farm Product Warehousing and Storage
- Automated Warehousing and Storage

#### Logistics Services
- Labeling
- Breaking Bulk
- Inventory Control and Management
- Light Assembly
- Order Entry and Fulfillment
- Packaging
- Pick and Pack
- Price Marking and Ticketing
- Transportation Arrangement

#### Warehouse Operations
- Bar-coding, Racking, Labeling, and Cross-docking
- Distribution and Information Systems
- Manual and Automated Material Handling Systems
- Packaging
- Product Stacking Requirements
- RFID and Other Product Identification Technology
- Security and Loss Prevention Systems
- Shipping and Receiving
- Warehouse Records and Documentation

#### Supply Chain Logistics
- Customs and Export Control
- Inventory Management
- Logistics Outsourcing
Supply Chain Elements

Technology
- Radio Frequency Identification (RFID)
- AutoID Technologies
- Materials Handling Technologies (e.g., Voice-directed Order Picking Technology)

Software
- Inventory Management
- Bar Coding
- Label Making
- Warehouse Management Systems (WMS)

Occupations
- Driver/Sales Workers and Truck Drivers
- First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand
- General and Operations Managers
- Heavy and Tractor-Trailer Truck Drivers
- Industrial Truck and Tractor Operators
- Laborers and Freight, Stock, and Material Movers, Hand
- Light Truck or Delivery Services Drivers
- Maintenance and Repair Workers, General
- Packers and Packagers, Hand
- Shipping, Receiving, and Traffic Clerks
- Stock Clerks and Order Fillers
- Transportation, Storage, and Distribution Managers

7. Pipeline: The activities required to construct, operate, and maintain transmission pipelines to transport products such as crude oil, natural gas, refined petroleum products, and slurry.

Types
- Gathering
- Transportation
- Distribution

Phases
- Design
- Right of Way
- Construction
- Maintenance
- Post Construction Restoration

**Material Transported**
- Crude Oil
- Natural Gas
- Refined Petroleum Products
- Slurry
- Non-hazardous Fluids

**Materials Selection and Design**
- Standard Practices (SPs)
- Material Requirements (MRs)
- Test Methods (TMs)

**Corrosion**
- Cathodic Protections
- Chemical Inhibitors
- Coatings

**Technology**
- Telecommunications
- Computer Systems
- Remote Control

**Occupations**
- Civil Engineers
- Control and Valve Installers and Repairers, Except Mechanical Door
- First-Line Supervisors of Production and Operating Workers
- Gas Compressor and Gas Pumping Station Operators
- Gas Plant Operators
- General and Operations Managers
- Heavy and Tractor-Trailer Truck Drivers
- Industrial Machinery Mechanics
- Laborers
- Operating Engineers and Other Construction Equipment Operators
- Petroleum Pump System Operators, Refinery Operators, and Gaugers
- Plumbers, Pipefitters, and Steamfitters

8. Scenic and Sightseeing Transportation (NAICS 487), the Postal Service (NAICS 491),
and Couriers and Messengers (NAICS 492)\textsuperscript{10}

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<td>\begin{itemize} \item The <strong>Scenic and Sightseeing Transportation</strong> subsector utilizes transportation equipment to provide recreation and entertainment. These activities have a production process distinct from passenger transportation carried out for the purpose of other types of for-hire transportation. This process does not emphasize efficient transportation; in fact, such activities often use obsolete vehicles, such as steam trains, to provide some extra ambience. The activity is local in nature, usually involving a same-day return to the point of departure. \item The <strong>Postal Service</strong> subsector includes the activities of the United States Postal Service and its subcontractors operating under a universal service obligation to provide mail services, and using the infrastructure required to fulfill that obligation. These services include delivering letters and small parcels. \item The <strong>Couriers and Messengers</strong> subsector provides intercity, local, and/or international delivery of parcels and documents (including express delivery services) without operating under a universal service obligation. These articles can be described as those that may be handled by one person without using special equipment. \end{itemize}</td>
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<td>\begin{itemize} \item Bus Drivers, Transit and Intercity \item Captains, Mates, and Pilots of Water Vessels \item Cargo and Freight Agents \item Couriers and Messengers \item Dispatchers, Except Police, Fire, and Ambulance \item First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators \item Heavy and Tractor-Trailer Truck Drivers \item Laborers and Freight, Stock, and Material Movers, Hand \item Light Truck or Delivery Services Drivers \item Motorboat Operators \item Postal Service Clerks \item Postal Service Mail Carriers \item Postal Service Mail Sorters, Processors, and Processing Machine Operators \item Postmasters and Mail Superintendents \item Reservation and Transportation Ticket Agents and Travel Clerks \item Sailors and Marine Oilers \item Shipping, Receiving, and Traffic Clerks \item Tour Guides and Escorts \item Transportation Attendants, Except Flight Attendants \end{itemize}</td>
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\textsuperscript{10} For more information, see [Transportation and Warehousing: NAICS 48–49](https://www.doleta.gov).

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Employment and Training Administration  
United States Department of Labor  
[www.doleta.gov](http://www.doleta.gov)
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<td>Professional Truck Driver Institute</td>
<td>Skill Standards for Entry-Level Tractor Trailer Drivers</td>
<td><a href="http://www.ptdi.org/errata/SKILLSTANDARDS_ENTRYLEVEL.pdf">http://www.ptdi.org/errata/SKILLSTANDARDS_ENTRYLEVEL.pdf</a></td>
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<td>Professional Truck Driver Institute</td>
<td>Skill Standards for Professional Solo Tractor Trailer Drivers</td>
<td><a href="http://www.ptdi.org/errata/DFSkillStandards.pdf">http://www.ptdi.org/errata/DFSkillStandards.pdf</a></td>
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<td>Southeast Maritime and Transportation (SMART) CenterSAE International</td>
<td>Transforming Futures: Building Maritime Career Pathways that Work</td>
<td><a href="http://www.sae.org/events/training/seminars/oaklandu/">http://www.sae.org/events/training/seminars/oaklandu/</a></td>
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<td>Texas Skill Standards Board</td>
<td>Logistics and Inventory Control</td>
<td><a href="http://www.tesb.org/wwpages/pdf/files/MSSCLogisticsandinventorycontrols.pdf">http://www.tesb.org/wwpages/pdf/files/MSSCLogisticsandinventorycontrols.pdf</a></td>
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<td>The Association for Operations Management</td>
<td>Certified in Production and Inventory Management</td>
<td><a href="http://www.apics.org/Certification/CPIIM/">http://www.apics.org/Certification/CPIIM/</a></td>
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<td>Transportation Curriculum Coordination Council</td>
<td>Core Curriculum Matrix</td>
<td><a href="http://tccc.gov/tcccmatrices.aspx">http://tccc.gov/tcccmatrices.aspx</a></td>
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<td>The Travel Institute</td>
<td>Certified Travel Associate (CTA) Program</td>
<td><a href="http://www.thetravelinstitute.com/home.cfm?tn=standard&amp;menuid=98&amp;navids=1,4,98&amp;pageid=83">http://www.thetravelinstitute.com/home.cfm?tn=standard&amp;menuid=98&amp;navids=1,4,98&amp;pageid=83</a></td>
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<td>The Travel Institute</td>
<td>Certified Travel Counselor (CTC) Program</td>
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<td>University of Vermont Transportation Research Center/U.S. Department of Education Office of Vocational and Adult Education</td>
<td>Transportation Workforce Development at Community Colleges, Distribution, &amp; Logistics (Career Cluster)</td>
<td><a href="http://www.careerclusters.org/resources/ClusterDocuments/tdldocuments/TDLFinal.pdf">http://www.careerclusters.org/resources/ClusterDocuments/tdldocuments/TDLFinal.pdf</a></td>
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<td>U.S. Department of Education Office of Vocational and Adult Education</td>
<td>Transportation, Distribution, &amp; Logistics (Career Lattice)</td>
<td><a href="http://www.careerclusters.org/resources/ClusterDocuments/tdldocuments/1TDLModel.pdf">http://www.careerclusters.org/resources/ClusterDocuments/tdldocuments/1TDLModel.pdf</a></td>
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