Transportation and Distribution Logistics Career Cluster

1. Describe the nature and scope of the Transportation, Distribution & Logistics Career Cluster and the role of transportation, distribution and logistics in society and the economy.

TD 1.1: Describe the various roles and major business functions of a TDL organization.
Sample Indicators:
- *Compare and contrast the various roles played by critical customers, suppliers and stakeholders within a TDL organization.*
- *Summarize past and present trends related to the mission of TDL organizations.*
- *Describe the major competitive challenges faced by TDL organizations.*
- *Identify the major internal job functions and organizational structures found among TDL organizations.*

TD 1.2: Summarize trends and challenges faced by TDL organizations.
Sample Indicators:
- *Describe past and present trends related to the mission of TDL organizations.*
- *Identify the major competitive challenges faced by TDL organizations in the industry today and in the future.*
- *State how an economic change such as economic growth/decline, income growth, consumer confidence, interest rates, and fuel and material costs may impact TDL business decisions.*
- *Describe how a social change such as consumer attitudes, consumer preferences and population shifts may impact a TDL business.*
- *Explain the impact of CNG, hybrids and electric propulsion systems.*

TD 1.3: Identify the major modes of transportation and their role in society.
Sample Indicators:
- *Give an example of each mode of transportation.*
- *Compare and contrast key features of systems that transport people and freight.*

TD 1.4: Describe how transportation systems and the infrastructure are provided.
Sample Indicators:
- *Explain the impact of public funds (local, state and federal) on transportation systems and infrastructure.*
- *Identify the role of the FAA and other transportation agencies on transportation systems.*

2. Describe the application and use of new and emerging advanced techniques to provide solutions for transportation, distribution and logistics problems.

TD 2.1: Execute the steps involved in the operation of a computer-driven machine to accomplish common work tasks.

Sample Indicators:
- *Operate equipment and machine with assistance.*
- *Secure needed supplies and resources.*
- *Follow power-up and log-on procedures.*
- *Interact with/respond to system messages using console device.*
- *Run applications/jobs in accordance with processing procedures.*
- *Follow log-off and power-down procedure(s).*

TD 2.2: Interpret installation and operation manuals in order to install and operate a computer-driven machine/equipment.
Sample Indicators:
- *Access needed information using appropriate reference materials.*

TD 2.3: Troubleshoot computer-driven equipment and machines and access relevant support sources as needed.
Sample Indicators:
- *Test system using diagnostic tools/software.*
- *Repair/replace malfunctioning hardware.*
- *Reinstall software as needed.*
- *Recover data and/or files.*
- *Restore system to normal operating standards.*
- *Complete failure/trouble reports correctly.*
- *Access in-house or external support as needed.*

TD 2.4: Execute procedures involved in using Geographic Information System/ Global Positions System (GIS/GPS) applications to perform various work functions.
Sample Indicators:
- *Create maps.*
- *Locate people or things.*
- *Identify best route for travel.*

TD 2.5: Demonstrate an understanding of transportation models for individuals and for optimizing distribution networks.
Sample Indicators:
- *Distinguish between various transportation models for individuals.*
- *Apply the best option of distribution networks to a given situation.*

3. **Describe the key operational activities required of successful transportation, distribution and logistics facilities.**

TD 3.1: Utilize financial data to determine profitability, cost reduction and asset utilization.

Sample Indicators:
- *Review and evaluate financial reports.*
- *Provide recommendations for customer sales/service growth.*
- *Evaluate internal operations to make improvements.*
- *Extract accurate data from technological systems to improve the performance and forecasting of TDL organizations.*

TD 3.2: Evaluate risk management strategies to prevent and reduce various risks and exposures within a TDL organization.
Sample Indicators:
- *State the potential impact various loss exposures such as property, liability and personnel may have on a business.*

TD 3.3: Manage ongoing customer relationships, internally and externally, to maintain business.
Sample Indicators:
- *Generate a list of potential customer needs and requirements.*
- *Compare and contrast critical performance issues associated with customer service and operations.*
- *List next steps that will fulfill customer requirements and produce customer satisfaction.*
- *Respond to customer problems and complaints in an effective and efficient manner.*

TD 3.4: Develop and manage plans and budgets to accomplish TDL organizational goals and objectives.
Sample Indicators:
- *Develop a work plan and budget that allocates people and resources efficiently.*
- *Develop a report that summarizes the key information about the performance and utilization of resources within an organization.*
- *Revise a program of work and related budgets to improve alignment with a TDL organization's goals and objectives.*

TD 3.5: Evaluate and apply written organizational policies, rules and procedures.
Sample Indicators:
- *Locate appropriate information on organizational policies in handbooks and manuals.*
- *Explain a specific organizational policy, rule, or procedure to improve a given situation.*
- *Demonstrate how to respond to unethical situations.*

4. **Identify governmental policies and procedures for transportation, distribution and logistics facilities.**

TD 4.1: Summarize the role government plays in regulating domestic transportation operations.
Sample Indicators:
- *Describe the legal responsibility an employee has regarding compliance with government laws and regulations.*

TD 4.2: Summarize various government policies created to regulate international transportation operations.
Sample Indicators:
- *Describe one government policy regarding the regulation of international transportation operations.*

TD 4.3: Summarize the impact of government policy on public transportation infrastructure management.
Sample Indicators:
- *Give an example of how a government policy affects public transportation infrastructure management.*

TD 4.4: Summarize the impact of government policy on health, safety, and environmental management in an organization.
Sample Indicators:
- *Recommend improvements for compliance in an area found to be deficient.*

TD 4.5: Describe the importance of corporate policies regarding ethical and legal responsibilities for a TDL organization.
Sample Indicators:
- *Compare and contrast the differences in ethical and legal responsibilities for the different positions within an organization; i.e., employer or employee.*

5. **Describe transportation, distribution and logistics employee rights and responsibilities and employers' obligations concerning occupational safety and health.**

TD 5.1: Demonstrate knowledge and understanding of rules and laws designed to promote safety and health in the workplace.
Sample Indicators:
- *Identify key rights of employees related to occupational safety and health.*
- *Identify the responsibilities of employers related to occupational safety and health.*
- *Explain the role of government agencies in providing a safe workplace.*
- *Describe how the major areas addressed in environmental laws and regulations affect the TDL organizations.*
- *Explain how the government collects, monitors, and utilizes data to assess health, safety and environmental performance of TDL organizations.*

TD 5.2: Assess workplace conditions through observations and experience.
Sample Indicators:
- *Identify the types of risk of injury/illness at work.*
- *Identify and describe common hazards in the workplace.*
- *Interpret safety signs and symbols.*

- *Identify and describe major sources of information about hazards in the workplace (e.g., MSDS, work procedures, training materials)*
- *Identify methods for disposing of hazardous materials.*

TD 5.3: Execute health, safety, and environmental procedures in a TDL organization.
Sample Indicators:
- *Educate workers regarding organizational safety, health, and environmental policies and procedures.*
- *Conduct audits and inspections to assure compliance with safety, health and environmental regulations.*
- *Maintain a system that documents compliance with safety, health and environmental regulations.*
- *Document the steps involved in an accident/incident investigation.*

6. **Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution & Logistics Career Pathways.**

TD 6.1: Research and match career opportunities based upon their fit with personal career goals.
Sample Indicators:
- *Locate and interpret career information for at least one Career Pathway.*
- *Identify job requirements for Career Pathways.*
- *Identify educational and credentialing requirements for Career Cluster and Career Pathways.*

TD 6.2: Match personal interests and aptitudes to careers when researching opportunities within the pathways.
Sample Indicators:
- *Identify personal interests and aptitudes.*
- *Identify job requirements and characteristics of selected careers.*
- *Compare personal interests and aptitudes with job requirements and characteristics of career selected.*
- *Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.*

Facility & Mobile Equipment Maintenance Career Pathway (TD-MTN)

1. **Develop preventative maintenance plans and systems to keep facility and mobile equipment inventory in operation.**

TD-MTN 1.1: Develop preventive maintenance plans and systems to meet business and equipment manufacturer requirements.
Sample Indicators:
- *Identify performance/reliability requirements for the use of facilities and equipment.*

- *Review and analyze facilities and equipment documentation to determine preventive maintenance requirements.*
- *Review safety and environmental regulations and policies to include HAZMAT to determine adequacy and compliance.*
- *Review performance/reliability and maintenance records to determine the efficacy of current systems and methods.*
- *Develop routine maintenance procedures and schedules to satisfy the performance/reliability requirements.*
- *Develop emergency maintenance procedures to satisfy the performance requirements.*
- *Determine equipment/material/supply and labor requirements for the procedures and schedules developed to satisfy performance/reliability requirements.*
- *Develop purchasing plans and inventory levels for supplies/parts needed to satisfy the developed procedures and schedules.*
- *Determine people and resources to satisfy the schedule and reliability requirements.*
- *Develop written preventative maintenance plans that satisfy the reliability requirements.*
- *Write and present suggested preventative maintenance plan*

TD-MTN 1.2: Apply strategies used to monitor and evaluate the performance of maintenance plans and systems.
Sample Indicators:
- *Monitor and maintain information on facilities and equipment use and reliability.*
- *Monitor and maintain information on the implementation and operation of preventive maintenance systems, including compliance with safety and environmental requirements (e.g., records, logs).*
- *Monitor and maintain information on the availability of parts/materials/supplies and the management of inventory levels.*
- *Evaluate maintenance plan and system performance and identify problems.*
- *Develop reports on system implementation and performance.*
- *Present and explain report.*

2. **Design ways to improve facility and equipment system performance.**

TD-MTN 2.1: Develop plans for improving facilities/equipment/system performance.
Sample Indicators:
- *Review maintenance reports on performance of current facilities, equipment, and the maintenance and reliability system.*
- *Analyze and evaluate professional literature on new products/technology/methods with higher levels of reliability and performance.*
- *Identify potential areas for improvement.*
- *Analyze costs and benefits of alternative strategies (e.g., buy new equipment, upgrade equipment, change maintenance system) for improving performance.*
- *Develop written improvement plan with recommendations.*

- *Present and explain plan.*

TD-MTN 2.2: Execute repair plans for facilities and mobile equipment.
Sample Indicators:
- *Document all repairs to equipment.*
- *Conduct periodic inspections of engines, powertrains, brakes, suspension systems, etc.*
- *Schedule oil sample analysis.*
- *Record any electronic fault codes that have been logged.*

TD-MTN 2.3: Develop and execute repair plans based upon an assessment of the facility/equipment inventory.
Sample Indicators:
- *Identify and describe facility and mobile equipment reliability/performance problems.*
- *Determine causes of reliability/performance problems of facilities, equipment, subsystems, and/or components including electrical/electronic, fluid power, and mechanical systems and computer control systems.*
- *Determine repair procedures and equipment, materials, parts, supplies, and labor requirements to accomplish repairs.*
- *Develop written plans (e.g., repair plan forms).*
- *Write complete description of repair and counseling.*

Health, Safety & Environmental Management Career Pathway (TD-HSE)

1. **Describe the health, safety and environmental rules and regulations in transportation, distribution and logistics workplaces.**

   TD-HSE 1.1: Conduct audits and inspections and evaluate compliance with company policies and government laws and regulations.
   Sample Indicators:
   - *Develop compliance checklist for conducting audits and inspections.*
   - *Develop audit/inspection process/procedures and schedule.*
   - *Conduct audits and inspections.*
   - *Document audit/inspection findings and make recommendations (e.g., report, memo).*
   - *Present and explain findings and recommendations (e.g., business meetings).*

   TD-HSE 1.2: Develop and update safety, health, and environmental management systems including policies, procedures, and documentation.
   Sample Indicators:
   - *Compile and review current systems including policies, procedures, and documentation.*
   - *Review current compliance problems (e.g., audit/inspection findings, documentation systems).*
   - *Review health/safety and environmental hazard analyses and incidence reports.*
   - *Identify changing government laws and regulations to include homeland security.*

- *Determine need for revising company policies, procedures, and systems.*
- *Develop report with recommended revisions.*
- *Present and explain recommended revisions (e.g., business meetings).*

TD-HSE 1.3: Manage the ongoing implementation of health, safety, and environmental policies, procedures, and documentation systems including development of communication plans that promote and support the effort.
Sample Indicators:
- *Prepare information and materials to promote awareness and advocate a safe and healthy work environment.*
- *Develop workplace materials and documentation tools to support system implementation and management.*
- *Prepare training materials for providing new employee orientation and recurrent training and support (including required employee training).*
- *Conduct employee training.*
- *Evaluate the effectiveness of promotional and support materials and employee training.*
- *Document communication, support, and training activities, and recommend improvements.*
- *Present and explain report and recommendations (e.g., business meetings).*

TD-HSE 1.4: Analyze potential hazards and risks and develop processes to prevent and/or manage health, safety, and environmental emergencies.
Sample Indicators:
- *Review current policies and procedures for emergency response.*
- *Review reports/documentation on emergency responses and emergency response drills.*
- *Review government laws and regulations.*
- *Revise/update current policies and procedures for emergency response.*
- *Develop communication, training, and support materials.*
- *Conduct training and emergency response drills.*
- *Develop report on updated policies, procedures, documentation, training, and drills and recommend next steps.*
- *Present and explain report and recommendations (e.g., business meetings).*

2. **Develop solutions to improve performance of health, safety and environmental management services.**

TD-HSE 2.1: Develop strategies to improve safety, health, and environmental system performance.
Sample Indicators:
- *Compile and analyze data on safety, health, and environmental performance.*
- *Identify most critical improvement opportunities.*
- *Identify and evaluate alternative improvement strategies/solutions.*
- *Recommend improvement strategies.*

- *Develop report on performance and improvement strategies.*
- *Present and explain report and recommendations (e.g., business meetings).*

TD-HSE 2.2: Conduct health, safety, and environmental incident investigations.
Sample Indicators:
- *Develop comprehensive description/documentation of incident(s) and notify relevant authorities.*
- *Conduct root cause analysis and identify causes of incident.*
- *Identify and evaluate potential solutions.*
- *Develop recommendations for corrective action.*
- *Develop report on incident findings and recommended corrective actions.*
- *Present and explain report and recommendations (e.g., business meetings).*

TD-HSE 2.3: Conduct safety, health, and environmental analyses to evaluate and manage risks associated with equipment and material utilization as well as work processes.
Sample Indicators:
- *Develop comprehensive description/documentation of hazards in the workplace.*
- *Conduct hazard analysis and review of potential hazard reduction/elimination strategies.*
- *Develop recommendations for hazard reduction or elimination.*
- *Develop report on hazard analysis findings and recommended corrective actions.*
- *Present and explain report and recommendations (e.g., business meetings).*

Logistics Planning & Management Services Pathway (TD-LOG)

1. Develop solutions to provide and manage logistics services for the company and customers.

TD-LOG 1.1: Assess company/customer needs and requirements using a structured process.
Sample Indicators:
- *Identify services that meet customer requirements.*
- *Determine service requirements.*
- *Estimate/forecast the demand for services.*
- *Document (e.g., report, memo, tables) customer requirements and service demand.*
- *Present and explain information on customer requirements and service demand (e.g., business meetings).*

TD-LOG 1.2: Assess the options for locating facilities and services within available logistics networks.
Sample Indicators:
- *Develop criteria for location decisions.*
- *Identify the general region(s) for locations.*
- *Identify and map potential locations.*
- *Evaluate alternative locations and determine service level and cost differences.*

- *Select locations.*
- *Document (e.g., report, memo, tables) evaluation process and location decisions.*
- *Present and explain information on location process and decisions (e.g., business meetings).*

TD-LOG 1.3: Develop transportation plans including costs, routes, and schedules for transporting people and goods.
Sample Indicators:
- *Determine origin and destination points for routing.*
- *Determine load levels and transportation requirements for goods and/or people.*
- *Determine availability of qualified operators and required transportation equipment.*
- *Develop routes to meet service and time requirements at lowest cost.*
- *Develop plans and schedules (including times, operators, equipment, and related resources) that meet service/time requirements at lowest costs.*
- *Develop transportation plan (e.g., report, memo, tables) including routing and scheduling.*
- *Present transportation plan (e.g., business meetings).*

TD-LOG 1.4: Develop warehousing/storage solutions that meet needs and requirements.
Sample Indicators:
- *Determine selection criteria for warehousing services (e.g., loading, storing, consolidating).*
- *Identify possible warehousing providers.*
- *Develop bid specifications for providers.*
- *Request bids from providers.*
- *Evaluate bids and select provider(s).*
- *Document (e.g., report, memo, tables) warehousing solution.*
- *Present and explain information on warehousing solutions (e.g., business meetings).*

TD-LOG 1.5: Develop packaging and material handling solutions to meet needs and requirements including HAZMAT requirements.
Sample Indicators:
- *Determine packaging, transporting, storage and handling requirements.*
- *Identify alternative solutions.*
- *Evaluate alternative solutions.*
- *Select most cost-effective solution.*
- *Document (e.g., report, memo, tables) evaluation process and selection decision.*
- *Present and explain information on packaging and material handling solutions (e.g., business meetings).*

TD-LOG 1.6: Develop documentation and information flow requirements and solutions.
Sample Indicators:
- *Determine required documentation to meet regulatory/legal requirements.*
- *Determine additional customer documentation and information flow requirements.*

- *Develop document package and proposed process for providing information to designated parties to meet legal and customer requirements.*
- *Document (e.g., report, memo, tables) documentation and information flow requirements and how documentation package and plan meets these requirements.*
- *Present and explain documentation and information flow solutions (e.g., business meetings).*

TD-LOG 1.7: Develop documentation and other requirements for international transportation and logistics.
Sample Indicators:
- *Determine required documentation to meet regulatory/legal requirements for international transportation.*
- *Determine additional customer documentation and information flow requirements.*
- *Develop document package and proposed process for providing information to designated parties to meet legal and customer requirements to include homeland security requirements.*
- *Document (e.g., report, memo, tables) international requirements.*
- *Present and explain information on international requirements (e.g., business meetings).*

TD-LOG 1.8: Develop and negotiate contracts for logistics planning and management services.
Sample Indicators:
- *Determine logistics and planning services to be bid and contracted.*
- *Develop proposal and review selection criteria.*
- *Identify possible service providers.*
- *Develop bid specifications for providers.*
- *Request bids from providers.*
- *Evaluate bids and select provider(s).*
- *Document (e.g., report, memo, tables) evaluation process and selection decision.*
- *Present and explain information on process and decisions (e.g., business meetings).*

TD-LOG 1.9: Select mode/modes of transportation needed to meet identified company/customer needs and requirements.
Sample Indicators:
- *Identify all possible modes.*
- *Develop criteria for selecting mode(s).*
- *Select most cost-effective mode(s) based on evaluation criteria.*
- *Document (e.g., report, memo, tables) evaluation process and selection decision.*
- *Present and explain information on process and decisions (e.g., business meetings).*

TD-LOG 1.10: Recommend the carriers to use for various transportation modes given the customer needs and requirements.
Sample Indicators:
- *Determine selection criteria for carriers.*
- *Identify possible carriers for selected mode(s).*

- *Develop bid specifications for carriers.*
- *Request bids from carriers.*
- *Evaluate bids and select carrier(s).*
- *Document (e.g., report, memo, tables) evaluation process and selection decision.*
- *Present and explain information on selection process and decisions (e.g., business meetings).*

2. **Analyze and improve performance of logistics systems to provide logistics planning and management services.**

TD-LOG 2.1: Assess and analyze data used to monitor and report on the performance of logistics systems.
Sample Indicators:
- *Develop performance measures and determine data requirements for monitoring performance.*
- *Collect and organize performance data in database.*
- *Establish performance targets/standards for monitoring performance.*
- *Analyze performance relative to targets/standards and identify performance problems.*
- *Document and report system performance trends and problems using graphs/charts (e.g., reports, memos).*
- *Present and explain information on system performance (e.g., business meetings).*

TD-LOG 2.2: Develop short-term and long-term logistics demand forecasts.
Sample Indicators:
- *Determine most appropriate forecasting method.*
- *Identify factors/variables for developing forecasting models.*
- *Determine data requirements.*
- *Gather and organize data into database.*
- *Develop and evaluate forecasts.*
- *Document forecasts using graphs and charts in written reports.*
- *Present and explain information on forecasting process and results (e.g., business meetings).*

TD-LOG 2.3: Evaluate risk factors and social and economic trends affecting logistics systems.
Sample Indicators:
- *Evaluate the potential risks associated with national or global political and government policy changes to include new homeland security requirements.*
- *Evaluate the potential risks of national or global social and cultural changes to include homeland security implications.*
- *Evaluate the potential risks of national or global technological changes.*
- *Evaluate the potential risks of national or global economic changes.*
- *Document evaluation of risk factors and implications for revising logistics solutions in written reports.*
- *Present and explain information on risks and implications (e.g., business meetings).*

TD-LOG 2.4: Evaluate compliance with documentation and other requirements for international transportation and logistics.
Sample Indicators:
- *Develop compliance checklist for international and homeland security requirements.*
- *Develop compliance review process for evaluating compliance.*
- *Conduct compliance review.*
- *Document compliance findings and make recommendations in writing (e.g., report, memo).*
- *Present and explain information on compliance (e.g., business meetings).*

TD-LOG 2.5: Evaluate performance and contract compliance of contractors and service providers.
Sample Indicators:
- *Identify performance and contract compliance requirements in contracts/agreements.*
- *Collect and organize contractor performance data into database.*
- *Analyze performance data.*
- *Develop compliance checklist and review procedure for other contract requirements.*
- *Conduct compliance review.*
- *Document findings in written reports/memos.*
- *Present and explain information on contractor performance (e.g., business meetings).*

TD-LOG 2.6: Develop strategies to improve quality and service of logistics while reducing costs.
Sample Indicators:
- *Determine performance gaps and improvement priorities.*
- *Identify and evaluate causes of performance gaps.*
- *Identify and evaluate potential solutions.*
- *Determine most appropriate solutions.*
- *Document causes and recommended solutions in written reports.*
- *Present and explain information on improvement solutions (e.g., business meetings).*

Sales and Service Career Pathway (TD-SAL)

1. **Analyze the ongoing performance of transportation, logistics and distribution-related sales and service operations.**

TD-SAL 1.1: Assess sales growth opportunities for new products and services.
Sample Indicators:
- *Analyze changing customer/market needs.*
- *Evaluate impacts of social, economic, and technological changes on future customer needs.*
- *Identify potential product/service features and mixes and pricing strategies to meet future needs.*
- *Evaluate competitor products/services and pricing strategies.*
- *Determine future demand for potential products and services.*
- *Identify most promising products and services.*

- *Develop report on recommended new products and services.*
- *Present and explain report (e.g., business meetings).*

TD-SAL 1.2: Develop plans to meet sales goals with existing products and services.
Sample Indicators:
- *Compile and analyze historical sales performance (e.g., spreadsheets, graphs).*
- *Develop sales goals and forecasts for sales period that meet business requirements.*
- *Develop promotion, pricing, sales strategies to meet sales goals.*
- *Develop sales plan report.*
- *Present and explain report (e.g., business meetings).*

TD-SAL 1.3: Assess the viability of existing product lines and services.
Sample Indicators:
- *Analyze customer/client needs and wants.*
- *Determine future demand for existing product line/service.*
- *Review features and pricing for competitiveness.*

2. **Demonstrate the use of sales and ongoing service of products and services that are transportation related to promote development of existing and future clients and customers.**

TD-SAL 1.1: Apply strategies and techniques used to sell logistics and transportation products and services.
Sample Indicators:
- *Establish customer relationship.*
- *Determine customer needs.*
- *Describe and explain alternative products and services and pricing (e.g., logistics services, transportation equipment, travel/routing arrangements).*
- *Assist customer in making decisions.*
- *Close customer sale.*
- *Complete sales transaction.*
- *Prepare sales documents (e.g., contracts, sales documents, travel arrangements/tickets).*
- *Present and explain sales documents to customer.*

TD-SAL 1.2: Apply strategies and techniques used to provide high-quality ongoing customer service.
Sample Indicators:
- *Greet customer.*
- *Determine customer needs.*
- *Locate and confirm customer contact and sales information.*
- *Determine and explain status of customer orders/purchases, transportation arrangements, and schedules.*
- *Identify potential or actual problems in providing customer products/services according to agreed arrangements and schedules.*

- *Develop solutions to meet customer needs.*
- *Document customer service solutions (e.g., memo, report).*
- *Present and explain solution to customer and sales/customer service team.*

Transportation Operations Career Pathway (TD-OPS)

1. **Demonstrate the use of sales and ongoing service of products and services that are transportation related to promote development of existing and future clients and customers.**

TD-OPS 1:1: Develop transportation plans including routes and schedules for transporting people and goods.
Sample Indicators:
- *Determine origin and destination points for routing.*
- *Determine load levels and transportation requirements for goods and/or people.*
- *Determine availability of qualified operators and required transportation equipment.*
- *Develop routes to meet service and time requirements at lowest cost.*
- *Develop plans and schedules (including times, operators, equipment, and related resources) that meet service/time requirements at lowest costs.*
- *Develop transportation plans (e.g., report, memo, tables) including routing and scheduling.*
- *Present transportation plans (e.g., business meetings).*

TD-OPS 1:2: Apply protocols to monitor and adjust transportation plans to meet customer requirements.
Sample Indicators:
- *Review current plans, routes, and schedules.*
- *Analyze information on the movement of people/goods according to plans and schedules.*
- *Determine need to adjust/review plans, routes, and schedules in response to changing conditions and customer requirements.*
- *Revise transportation plans (e.g., report, memo, tables/charts) including routing and scheduling.*
- *Present revised plans (e.g., business meetings).*

TD-OPS 1:3: Apply strategies for managing traffic flow at transportation hubs, facilities and staging areas.
Sample Indicators:
- *Develop/review plans and schedules for arrival, loading/staging, and departure at transportation facility.*
- *Analyze current status of scheduled arrivals and departures relative to plans.*
- *Determine need to adjust/review staging/loading arrangements at the facility.*
- *Revise traffic flow and staging plans and schedules (e.g., report, memo, charts/tables).*
- *Present revised plans (e.g., team meetings).*

TD-OPS 1:4: Negotiate contracts for transportation operations services.
Sample Indicators:
- *Determine transportation services to be bid and contracted.*
- *Develop proposal and review/selection criteria.*
- *Identify possible service providers.*
- *Develop bid specifications for providers.*
- *Request bids from providers.*
- *Evaluate bids and select provider(s).*
- *Document (e.g., report, memo, tables) evaluation process and selection decision.*
- *Present and explain information on process and decisions (e.g., business meetings).*

2. **Analyze performance of transportation operations in order to improve quality and service levels and increase efficiency.**

TD-OPS 2.1: Apply strategies and protocols used to monitor and report on the performance of transportation operations.
Sample Indicators:
- *Develop performance measures and determine data requirements for monitoring performance.*
- *Collect and organize performance data in database.*
- *Establish performance targets/standards for monitoring performance.*
- *Analyze performance relative to targets/standards and identify performance problems.*
- *Document and report system performance trends and problems using graphs/charts (e.g., reports, memos).*
- *Present and explain information on performance (e.g., business meetings).*

TD-OPS 2.2: Develop strategies based upon data collected that will improve quality and service levels while reducing costs.
Sample Indicators:
- *Determine performance gaps and improvement opportunities (e.g., on-time delivery, yields, capacity utilization, costs).*
- *Identify and evaluate causes of performance gaps.*
- *Identify and evaluate potential solutions (e.g., routing, scheduling, equipment upgrades, operator training).*
- *Determine most appropriate solutions.*
- *Document causes and recommended solutions in written reports.*
- *Present and explain proposed solutions (e.g., business meetings).*

3. **Comply with policies, laws and regulations in order to maintain safety, security and health and mitigate the economic and environmental risk of transportation operations.**

TD-OPS 3.1: Apply techniques used to monitor and evaluate compliance with company policies and government laws and regulations with special attention to HAZMAT and Homeland Security requirements.
Sample Indicators:
- *Develop compliance checklist for conducting review.*
- *Develop compliance review process.*
- *Conduct compliance review.*
- *Document compliance findings and make recommendations (e.g., report, memo).*
- *Present and explain compliance findings and recommendations (e.g., business meetings).*

TD-OPS 3.2: Revise company policies, procedures, and information/documentation systems to improve compliance with changing customer/business requirements (e.g., quality systems) and government laws and regulations (e.g., health, safety, environment).
Sample Indicators:
- *Review current compliance problems (e.g., compliance review findings).*
- *Identify changing customer/business requirements and government laws and regulations, especially those related to HAZMAT and homeland security.*
- *Determine need for revising company policies, procedures, and systems.*
- *Develop report with recommended revisions.*
- *Present and explain recommended revisions (e.g., business meetings).*

Transportation Systems/Infrastructure Planning, Management & Regulation Career Pathway (TD-SYS)

1. Develop plans to maintain and/or improve the transportation infrastructure.

TD-SYS 1.1: Develop plans to maintain transportation infrastructure.
Sample Indicators:
- *Review and analyze maintenance requirements of infrastructure.*
- *Monitor and analyze the usage and conditions of transportation infrastructure.*
- *Develop maintenance plans including schedules, material and labor requirements, and budgets.*
- *Present and explain plans (e.g., business meetings).*
- *Assess impact of climate change, changing demographics, and energy cost.*

TD-SYS 1.2: Develop plans for new, improved, or discontinued transportation infrastructure (e.g., highways, airports, train terminals, ports, intermodal facilities).
Sample Indicators:
- *Analyze changing customer/market needs and requirements.*
- *Explain local, state, and federal political influences and impact on requirements to include homeland security implications.*
- *Determine the key features and capabilities of public infrastructure to meet these requirements.*
- *Develop projections of the demand for and utilization of infrastructure.*

- *Evaluate the costs and benefits of public transportation infrastructure including environmental, economic, and social impacts.*
- *Develop plans for transportation infrastructure including reports and land and infrastructure maps and drawings and related design documents.*
- *Present and explain plans (e.g., public meetings).*

2. **Assess, plan and manage the implementation of transportation services.**

TD-SYS 2.1: Apply strategies used to monitor and report on the performance of transit operations.
Sample Indicators:
- *Analyze changing customer/market needs and requirements.*
- *Determine the key features and capabilities of services to meet requirements.*
- *Develop projections of the demand for and utilization of services.*
- *Evaluate the costs and benefits of public transportation services (including economic, social, environmental).*
- *Develop plans for public transportation services including projected routes and schedules and related infrastructure and equipment requirements.*
- *Present and explain plans (e.g., public meetings).*

TD-SYS 2.2: Develop strategies to improve service levels and quality and reduce costs.
Sample Indicators:
- *Develop performance measures and determine data requirements for monitoring performance.*
- *Collect and organize performance data in database.*
- *Establish performance targets/standards for monitoring performance.*
- *Analyze performance relative to targets/standards and identify performance problems.*
- *Document and report system performance trends and problems using graphs/charts (e.g., reports, memos).*
- *Present and explain information on performance (e.g., business meetings).*

TD-SYS 2.3: Develop plans for new, improved, or discontinued transportation services including transit transportation services.
Sample Indicators:
- Analyze changing customer/market needs and requirements.
- Determine the key features and capabilities of services to meet requirements.
- Develop projections of the demand for and utilization of services.
- Evaluate the costs and benefits of public transportation services (including economic, social, environmental).
- Develop plans for public transportation services including projected routes and schedules and related infrastructure and equipment requirements.
- Present and explain plans (e.g., public meetings).

3. Describe ways to improve the system utilization, flow, safety and environmental performance of transportation systems.

TD-SYS 3.1: Develop plans to improve system utilization and traffic flow.
Sample Indicators:
- *Determine performance gaps and improvement opportunities (e.g., on schedule, ridership, capacity utilization, costs).*
- *Identify and evaluate causes of performance gaps.*
- *Identify and evaluate potential solutions (e.g., routing, scheduling, equipment upgrades, operator training).*
- *Determine most appropriate solutions.*
- *Document causes and recommended solutions in written reports.*
- *Present and explain proposed solutions (e.g., business meetings).*
- *Identify uses of new technology for improving efficiency of the system.*

TD-SYS 3.2: Develop plans to improve safety and environmental performance of carriers and safety conditions in transportation systems.
Sample Indicators:
- *Analyze the safety and environmental performance of carriers and safety conditions in transportation systems.*
- *Determine major problem areas such as homeland security, hazardous materials and crash rates*
- *Identify and evaluate alternative solutions.*
- *Develop plans to improve safety and environmental performance.*
- *Present and explain plans (e.g., public meetings).*
- *Determine finance and funding component of proposed solutions.*

Warehousing & Distribution Center Operations Pathway (TD-WAR)

1. Demonstrate efficient and effective warehouse and distribution center operations.

TD-WAR 1.1: Develop packaging, storage, and handling solutions for goods and materials.
Sample Indicators:
- *Determine potential risks or damage from normal rigors including compression, shock, drop, moisture, corrosion, vibration, temperature and motion to include HAZMAT risks during transportation and handling.*
- *Determine potential hazards to other goods and materials and health, safety, and environmental risks.*
- *Determine size, weight, and shape requirements for packaging solutions.*
- *Determine best handling and storage methods and additional packaging requirements for these methods.*
- *Determine customer visual design and appearance requirements including handling information, warnings, display requirements, and required documentation.*

- *Determine other customer functional requirements including display/presentation and assembly and use requirements.*
- *Develop and test alternative packaging solutions and document test results.*
- *Document and develop prototypes of proposed packaging solution meeting requirements.*
- *Present and explain solution to customers (e.g., business meetings).*
- *Identify and map potential locations.*
- *Evaluate alternative locations and determine service level and cost differences.*
- *Select locations.*
- *Document (e.g., report, memo, tables) evaluation process and location decisions.*

TD-WAR 1.2: Develop warehousing solutions to meet customer and business requirements.
Sample Indicators:
- *Determine customer requirements for warehousing services including processing, handling, and storing goods and materials including additional logistics and information services (e.g., reviewing customer compliance manuals).*
- *Project short-term and long-term demand for warehousing services including the volume and flow of goods and materials to and from warehouse(s).*
- *Determine and map warehouse location(s).*
- *Determine size and configuration of warehouse structure and infrastructure requirements and develop external layout plan (e.g., access roads, lots, dock configuration).*
- *Develop internal layout plan including areas for processing incoming and outgoing products, cross-docking, and storage.*
- *Select material handling and storage equipment.*
- *Develop policies and procedures for processing goods and materials that meet customer requirements and comply in government regulations.*
- *Determine documentation and information requirements for managing warehouse operations.*
- *Develop report on proposed warehousing solution.*
- *Present and explain information on warehousing solution (e.g., business meetings).*

TD-WAR 1.3: Process incoming goods and materials using standardized protocols and procedures.
Sample Indicators:
- *Determine scheduled volume and flow of incoming products for day/week.*
- *Determine equipment and staffing requirements and develop traffic management and work schedules.*
- *Select space for storing or cross-docking of incoming products.*
- *Develop instructions and related documentation (e.g., labels) for internal processing/storage.*
- *Confirm documentation (e.g., bill of lading, packing lists, MSDS sheets) and seals on incoming products and accept shipments.*
- *Unload and confirm quantity and contents of shipments and inspect for damage/hazards.*
- *Move to storage and cross-docking areas.*
- *Complete documentation on incoming processing and condition of products.*

- *Complete daily/weekly reports for customers and business on processing activities and inventory.*
- *Present and explain reports at business meetings.*

TD-WAR 1.4: Process outbound shipments using standardized protocols and procedures.
Sample Indicators:
- *Determine scheduled volume and flow of outbound products for day/week.*
- *Determine equipment and staffing requirements and develop traffic management and work schedules.*
- *Develop instructions for picking, moving, unitizing, and packaging outbound shipment.*
- *Develop and package shipping documentation (e.g., bill of lading, packing lists, international documentation, placards, MSDS sheets).*
- *Pick, assemble, and package orders and load and secure them within containers and transport equipment (e.g., truck trailers, rail cars).*
- *Transfer and process documentation with transporter.*
- *Complete documentation on outbound processing.*
- *Complete daily/weekly reports for customers and business on processing activities and inventory.*
- *Present and explain reports at business meetings.*

TD-WAR 1.5: Manage inventory according to company policies and customer requirements.
Sample Indicators:
- *Forecast demand for products and materials for shipping.*
- *Determine required inventory levels to meet projected demand and maintain customer defined service levels (e.g., safety stock levels).*
- *Project incoming shipment level and schedules to maintain inventory levels.*
- *Conduct inventory control audits and develop inventory control reports.*
- *Develop reports on inventory management and control to include HAZMAT requirements.*
- *Present and explain information on location process and decisions (e.g., business meetings).*

2. **Describe ways to improve the performance of warehouse and distribution operations.**

TD-WAR 2.1: Develop a plan to improve warehousing operations systems, processes and procedures.
Sample Indicators:
- *Compile warehouse performance data.*
- *Analyze performance relative to targets/standards and identify performance problems.*
- *Document and report system performance trends and problems using graphs/charts (e.g., reports, memos).*
- *Identify potential solutions.*
- *Evaluate and select best solutions.*
- *Present and explain information on system performance and proposed solutions (e.g., business meetings).*

TD-WAR 2.2: Identify and document improvements recommended in the performance and reliability of material handling equipment and management information systems.
Sample Indicators:
- *Compile warehouse equipment/system performance and reliability data.*
- *Analyze performance relative to targets/standards and identify performance problems.*
- *Document and report system performance trends and problems using graphs/charts (e.g., reports, memos).*
- *Identify potential solutions.*
- *Evaluate and select best solutions.*
- *Present and explain information on performance/reliability and proposed solutions (e.g., business meetings).*

3. **Analyze compliance with company policies and government laws and regulations in warehouse and distribution operations.**

TD-WAR 3.1: Apply protocols and procedures to maintain compliance with and performance of security and loss prevention systems.
Sample Indicators:
- *Analyze changes in government laws and regulations (e.g., control of hazardous materials) and new customer requirements and determine required system changes.*
- *Conduct inventory control, security/loss prevention reviews and audits to determine level of conformity.*
- *Compile and analyze damage and loss data and audit findings.*
- *Determine causes of system failures.*
- *Identify and evaluate alternative solutions.*
- *Develop report on system performance and proposed solutions.*
- *Present and explain report in business meetings.*

TD-WAR 3.2: Apply protocols and procedures to maintain compliance with and performance of quality management systems.
Sample Indicators:
- *Analyze changes in government laws and regulations (e.g., government procurement, homeland security) and new customer requirements (e.g., ISO 9000) and determine required system changes.*
- *Conduct quality reviews and audits to determine level of conformity.*
- *Compile and analyze quality failure cost data and audit findings.*
- *Determine causes of system failures.*
- *Identify and evaluate alternative solutions.*
- *Develop report on system performance and proposed solutions.*
- *Present and explain report in business meetings.*

TD-WAR 3.3: Apply protocols and procedures to maintain compliance with and performance of health, safety, and environmental management system requirements.

Sample Indicators:

- *Analyze changes in government laws and regulations and new customer requirements and determine required system changes.*
- *Conduct health, safety, and environmental reviews/audits to determine level of conformity.*
- *Compile and analyze health, safety, and environmental incidence data and audit findings.*
- *Determine causes of system failures.*
- *Identify and evaluate alternative solutions.*
- *Develop report on system performance and proposed solutions.*
- *Present and explain report in business meetings.*