

## LEHIGH VALLEY SKILLS GAP ANALYSIS

Lehigh Valley employers have told the Lehigh Valley Workforce Investment Board, Inc. (LVWIB) that they continue to be challenged with finding qualified candidates for open positions. The increasing use of technology and need for employees able to perform multiple tasks makes recruitment difficult, despite relatively high unemployment rates among our workforce.

To quantify this challenge faced by both Pennsylvania and Lehigh Valley employers, the PA Center for Workforce Information Analysis (CWIA) conducted a survey and analysis in June 2011. A total of 481 employers in PA, including 23 in the Lehigh Valley, responded to the survey. The following describes the high-demand occupations most mentioned in employer responses, categorized by Industry Cluster:

### Healthcare Industry Cluster

29-1051.00	Pharmacists
31-2021.00	Physical Therapist Assistants
29-1126.00	Respiratory Therapists
29-1141.00	Registered Nurse (RN)
29-2041.00	Emergency Medical Technicians and Paramedics
29-2052.00	Pharmacy Technicians
29-2061.00	Licensed Practical and Licensed Vocational Nurses (LPN)
31-1011.00	Home Health Aides
31-1014.00	Nursing Assistants
	[Deleted Physical Therapists SOC Code 29-1123]

### Manufacturing and Construction Industry Cluster

17-3024.00	Electrical-Mechanical Maintenance Technicians
47-2111.00	Electrician
49-9021.01	Heating and Air Conditioning Mechanics and Installers
49-9021.02	Refrigeration Service Technicians
49-9071.00	Maintenance and Repair Workers, General
51-4011.00	Computer Controlled Machine Tool Operators/ Machinists
51-4121.06	Welders, Cutters, and Welder Fitters
	[Deleted Process Engineers SOC Code 17-2199.04]

### Transportation and Logistics

53-3032.00	CDL Drivers - Heavy and Tractor-Trailer Truck Drivers
53-7051.00	Forklift Truck Driver - Industrial Truck and Tractor Operators

In order to identify core reasons behind the difficulty of filling these occupational categories, LVWIB looked at the specific sets of Knowledge, Skills and Abilities (KSA's) associated with each of these occupations. For purposes of analysis, occupations were grouped into the primary industry sectors of Manufacturing and Construction, Healthcare, and Transportation and Logistics, as shown in the following KSA Analysis.

In the case of healthcare, the KSA's for each of the 9 high demand occupations were arrayed according to incidence. For example, *Deductive Reasoning* was the most frequently mentioned in Abilities (8 times) for each of the occupations. *Multi-limb coordination* was the least mentioned (1 time). All other Abilities fell somewhere in between.

### Knowledge, Skills and Abilities for Healthcare in ranked order:

#### Healthcare – Knowledge

**Customer and Personal Service:** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

**English Language:** Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

**Medicine and Dentistry:** Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.

**Education and Training:** Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

**Biology:** Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.

**Mathematics:** Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

**Therapy and Counseling:** Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counseling and guidance.

**Public Safety and Security:** Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

**Administration and Management:** Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

**Chemistry:** Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.

**Computers and Electronics:** Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

**Law and Government:** Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.

**Clerical:** Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.

**Mechanical:** Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

**Personnel and Human Resources:** Knowledge of principles and procedures for personnel recruitment, selection, training, compensation and benefits, labor relations and negotiation, and personnel information systems.

**Physics:** Knowledge and prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.

**Psychology —** Knowledge of human behavior and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioral and affective disorders.

**Sociology and Anthropology —** Knowledge of group behavior and dynamics, societal trends and influences, human migrations, ethnicity, cultures and their history and origins.

**Transportation —** Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.

## **Healthcare - Skills**

**Active Listening:** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Critical Thinking:** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Monitoring:** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

**Service Orientation:** Actively looking for ways to help people.

**Speaking:** Talking to others to convey information effectively.

**Coordination —** Adjusting actions in relation to others' actions.

**Social Perceptiveness:** Being aware of others' reactions and understanding why they react as they do.

**Judgment and Decision Making:** Considering the relative costs and benefits of potential actions to choose the most appropriate one.

**Reading Comprehension:** Understanding written sentences and paragraphs in work related documents.

**Active Learning:** Understanding the implications of new information for both current and future problem-solving and decision-making.

**Instructing:** Teaching others how to do something.

**Science:** Using scientific rules and methods to solve problems.

**Time Management:** Managing one's own time and the time of others.

**Complex Problem Solving:** Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

**Mathematics:** Using mathematics to solve problems.

**Writing:** Communicating effectively in writing as appropriate for the needs of the audience.

## Healthcare - Abilities

**Deductive Reasoning:** The ability to apply general rules to specific problems to produce answers that make sense.

**Oral Comprehension:** The ability to listen to and understand information and ideas presented through spoken words and sentences.

**Oral Expression:** The ability to communicate information and ideas in speaking so others will understand.

**Problem Sensitivity:** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**Inductive Reasoning:** The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).

**Speech Clarity:** The ability to speak clearly so others can understand you.

**Written Comprehension:** The ability to read and understand information and ideas presented in writing.

**Information Ordering:** The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).

**Speech Recognition:** The ability to identify and understand the speech of another person.

**Near Vision:** The ability to see details at close range (within a few feet of the observer).

**Written Expression:** The ability to communicate information and ideas in writing so others will understand.

**Category Flexibility:** The ability to generate or use different sets of rules for combining or grouping things in different ways.

**Arm-Hand Steadiness:** The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

**Finger Dexterity:** The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.

**Multilimb Coordination:** The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.

Similarly for Manufacturing, KSA's for each of the 7 individual occupations were arrayed according to incidence. *Near Vision* was the most frequently mentioned of Abilities (7 times) for each of the occupations. *Arm-Hand Steadiness* and *Deductive Reasoning* were tied for second place (6 times).

**Knowledge, Skills and Abilities for Manufacturing and Construction in ranked order:**

## **Manufacturing and Construction - Knowledge**

**Mechanical:** Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

**Mathematics:** Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

**Customer and Personal Service:** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

**Engineering and Technology:** Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

**English Language:** Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

**Building and Construction:** Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.

**Design:** Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.

**Physics:** Knowledge and prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub- atomic structures and processes.

**Administration and Management:** Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

**Computers and Electronics:** Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

**Production and Processing:** Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.

**Public Safety and Security:** Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

**Economics and Accounting:** Knowledge of economic and accounting principles and practices, the financial markets, banking and the analysis and reporting of financial data.

**Education and Training:** Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

**Telecommunications:** Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems.

## **Manufacturing and Construction - Skills**

**Active Learning:** Understanding the implications of new information for both current and future problem-solving and decision-making.

**Critical Thinking:** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Operation Monitoring:** Watching gauges, dials, or other indicators to make sure a machine is working properly.

**Quality Control Analysis:** Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

**Complex Problem Solving:** Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

**Repairing:** Repairing machines or systems using the needed tools.

**Troubleshooting:** Determining causes of operating errors and deciding what to do about it.

**Equipment Maintenance:** Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

**Judgment and Decision Making:** Considering the relative costs and benefits of potential actions to choose the most appropriate one.

**Monitoring:** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

**Operation and Control:** Controlling operations of equipment or systems.

**Equipment Selection:** Determining the kind of tools and equipment needed to do a job.

**Installation:** Installing equipment, machines, wiring, or programs to meet specifications.

**Reading Comprehension:** Understanding written sentences and paragraphs in work related documents.

**Mathematics:** Using mathematics to solve problems.

**Speaking:** Talking to others to convey information effectively.

**Systems Analysis:** Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.

**Systems Evaluation:** Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

**Technology Design:** Generating or adapting equipment and technology to serve user needs.

**Time Management:** Managing one's own time and the time of others.

## **Manufacturing and Construction - Abilities**

**Near Vision:** The ability to see details at close range (within a few feet of the observer).

**Arm-Hand Steadiness:** The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

**Problem Sensitivity:** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**Deductive Reasoning:** The ability to apply general rules to specific problems to produce answers that make sense.

**Finger Dexterity:** The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.

**Inductive Reasoning:** The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).

**Information Ordering:** The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).

**Manual Dexterity:** The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.

**Multilimb Coordination:** The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.

**Control Precision:** The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

**Oral Comprehension:** The ability to listen to and understand information and ideas presented through spoken words and sentences.

**Oral Expression:** The ability to communicate information and ideas in speaking so others will understand.

**Visualization:** The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

**Hearing Sensitivity:** The ability to detect or tell the differences between sounds that vary in pitch and loudness.

**Perceptual Speed:** The ability to quickly and accurately compare similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.

**Selective Attention:** The ability to concentrate on a task over a period of time without being distracted.

**Category Flexibility:** The ability to generate or use different sets of rules for combining or grouping things in different ways.

**Extent Flexibility:** The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.

**Far Vision:** The ability to see details at a distance.

**Mathematical Reasoning:** The ability to choose the right mathematical methods or formulas to solve a problem.

**Number Facility:** The ability to add, subtract, multiply, or divide quickly and correctly.

**Rate Control:** The ability to time your movements or the movement of a piece of equipment in anticipation of changes in the speed and/or direction of a moving object or scene.

**Reaction Time:** The ability to quickly respond (with the hand, finger, or foot) to a signal (sound, light, picture) when it appears.

**Speech Recognition:** The ability to identify and understand the speech of another person.

**Trunk Strength:** The ability to use your abdominal and lower back muscles to support part of the body repeatedly or continuously over time without 'giving out' or fatiguing.

**Visual Color Discrimination —** The ability to match or detect differences between colors, including shades of color and brightness.

Lastly, for the Transportation and Logistics Industry Cluster, the survey showed that two occupations in greatest demand were CDL and Fork-lift/Truck Drivers. Each of the following abilities was listed once for the combined grouping of occupations:

**Knowledge, Skills and Abilities for Transportation and Logistics in ranked order:**

## **Transportation and Logistics - Knowledge**

**Administration and Management:** Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

**Customer and Personal Service:** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

**Mechanical:** Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

**Public Safety and Security:** Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

**Transportation:** Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.

## Transportation and Logistics - Skills

**Active Listening:** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Critical Thinking:** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Judgment and Decision Making:** Considering the relative costs and benefits of potential actions to choose the most appropriate one.

**Monitoring:** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

**Operation and Control:** Controlling operations of equipment or systems.

**Operation Monitoring:** Watching gauges, dials, or other indicators to make sure a machine is working properly.

**Reading Comprehension:** Understanding written sentences and paragraphs in work related documents.

**Repairing:** Repairing machines or systems using the needed tools.

**Time Management:** Managing one's own time and the time of others.

**Troubleshooting:** Determining causes of operating errors and deciding what to do about it.

## Transportation and Logistics - Abilities

**Control Precision :** The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

**Depth Perception:** The ability to judge which of several objects is closer or farther away from you, or to judge the distance between you and an object.

**Far Vision:** The ability to see details at a distance.

**Multilimb Coordination:** The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.

**Near Vision:** The ability to see details at close range (within a few feet of the observer).

**Problem Sensitivity:** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**Rate Control:** The ability to time your movements or the movement of a piece of equipment in anticipation of changes in the speed and/or direction of a moving object or scene.

**Reaction Time:** The ability to quickly respond (with the hand, finger, or foot) to a signal (sound, light, picture) when it appears.

**Response Orientation:** The ability to choose quickly between two or more movements in response to two or more different signals (lights, sounds, pictures). It includes the speed with which the correct response is started with the hand, foot, or other body part.

**Spatial Orientation:** The ability to know your location in relation to the environment or to know where other objects are in relation to you.