

# ATLB-1240: WORK ZONE TRAFFIC TECHNICIAN

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## Cuyahoga Community College

**Viewing: ATLB-1240 : Work Zone Traffic Technician**

**Board of Trustees:**

January 2021

**Academic Term:**

Fall 2021

**Subject Code**

ATLB - AIT-Construct/Hazard Material

**Course Number:**

1240

**Title:**

Work Zone Traffic Technician

**Catalog Description:**

Introductory course addressing the duties and responsibilities of the work zone technician on site and the implementation of ODOT traffic control plans. Proper placement of work zone tapers, roadway signs and channeling devices per traffic maintenance drawings and details are included. Also covered are job related environmental hazards and first responder treatments for affected workers. Hands-on application of the outcomes and objectives of this course is an integral component of the class.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

Departmental approval: admission to Laborers' apprenticeship program.

## Outcomes

**Course Outcome(s):**

Demonstrate the ability to select and don proper Personal Protective Equipment (PPE), conduct relates safety inspection, identify jobsite equipment blind spots, and employ effective communication practices.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. List and define terms related to practical work-zone traffic safety.
2. Identify the PPE required for traffic control.
3. Conduct a work-zone safety inspection covering equipment, ground and roadway conditions including weather related effects and physical obstructions and daily log.
4. Explain the importance of identification equipment/vehicle blind spots and determine obstructions within operational quadrants.
5. Provide clear and effective communication systems to alert equipment operators, workers, and/or general public of pending danger within the work-zone boundaries or activity areas.

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**Course Outcome(s):**

Explain the principles of temporary traffic control and develop a traffic control plan for roadway construction safety.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Examine all Manual on Uniform Traffic Control Devices (MUTCD) guidelines for roadway construction specifications and notes relative to establishing safe traffic work zones.
  2. Demonstrate a working knowledge of the procedures for setting up and maintaining temporary traffic work zones.
  3. Interpret or analyze the plans of the four traffic zones.
  4. Discuss the importance of advanced warning areas and how they impact the safety of the worker, motorist, and pedestrian.
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**Course Outcome(s):**

Explain the different work zone tapers, compute the length of each, identify the various roadway signs and channeling devices, and the required spacing of each.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. List and explain the use of five different types of work zone tapers.
  2. Explain how tapers are used in conjunction with flashing arrow panels on expressways.
  3. Calculate merging tapers lengths for traffic speeds less than or equal to 40 miles per hour and greater than or equal to 45 miles per hour.
  4. List three categories of roadway signs.
  5. Explain the use of roadway signs based on categories including advanced warning, actual construction zone, and work zone end.
  6. List four major types of channeling devices and explain how each is used.
  7. Determine the proper placement of roadway signs and channeling devices.
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**Course Outcome(s):**

Interpret traffic maintenance drawings including sections and details used for traffic control.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Evaluate state highway standards for determining required signage and channeling devices.
  2. Interpret sectional drawings and details to determine barricade construction, sign placement and special considerations.
  3. Establish locations of barrier walls that are installed for worker safety.
  4. Interpret traffic control drawings to establish traffic control zones.
  5. Estimate construction materials and list required traffic control equipment.
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**Course Outcome(s):**

Identify job related environmental hazards, including hot and cold exposure, biological risks and blood borne pathogens and discuss the related signs, symptoms and treatment of related environmental hazards of highway work.

**Objective(s):**

1. List and define terms related to highway work hazards.
2. Identify the different types of highway vegetation, infectious insects and fauna that highway workers may encounter on jobsites.
3. Describe the various initial treatments for poisonous plants, insect bites, and related medical emergencies.
4. Explain how hot and cold environments affect highway workers and describe related symptoms.
5. List the various blood borne pathogens and discuss avoidance procedures for each.

6. Discuss the importance of training in first responder emergency treatment for highway worker related and health affecting exposures.
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**Methods of Evaluation:**

1. Quizzes
2. Tests
3. Class participation
4. Student must also demonstrate the ability to properly set up work zones and properly assess worksite injuries and administer first responder treatment.

**Course Content Outline:**

1. Work Zone Traffic Technician Awareness
  - a. Terminology
    - i. Blind spot
    - ii. Operator
    - iii. Speed limit
    - iv. Barricade
    - v. Safety vest
    - vi. Job hazard analysis (JHA)
    - vii. Retroreflective
    - viii. Warning lights
    - ix. Back up alarm
    - x. Pinch point
    - xi. Site distance
    - xii. Work zone
  - b. Traffic control PPE
    - i. Hard hat
    - ii. Safety glasses
    - iii. Reflective vest
    - iv. Halo
    - v. Wristlets
    - vi. Anklets
2. Work zone safety inspection
  - a. Equipment
    - i. Wipers
    - ii. Brakes
      1. Parking
      2. Service
    - iii. Alarms
      1. Back-up
      2. Horn
    - iv. Protective systems
      1. Roll over
      2. Falling objects
    - v. Mirrors
  - b. Ground/roadway conditions
    - i. Ground
      1. Uneven
      2. Sloped
      3. Unstable
    - ii. Roadway
      1. Slippery
      2. Visibility
      3. Stopping distance
      4. Site distance
    - iii. Weather

1. Current
2. Future forecast
3. Existing factors
- c. Physical obstruction
  - i. Foliage
    1. Trees
    2. Shrubs
  - ii. Terrain
    1. Hills
    2. Curves
    3. Sharp turns
  - iii. Permanent roadway signs
  - iv. Parked vehicles
  - v. Mail boxes
3. Blind spots: equipment/vehicle
  - a. Operational quadrant
    - i. Front
    - ii. Rear
    - iii. Left side
    - iv. Right side
  - b. Importance
    - i. Changing blind spots
    - ii. Accident prevention
    - iii. Personal injury
    - iv. Equipment damage
4. Communication
  - a. Alerts
    - i. Equipment operators
    - ii. Workers
    - iii. General public
  - b. Types
    - i. Verbal
    - ii. Visual
    - iii. Audible
    - iv. Signage
5. Traffic: Principles and Plans
  - a. Manual of Uniform Traffic Control Devices MUTCD
    - i. Signage
    - ii. Worker apparel
    - iii. Inference
  - b. Work zone set up
    - i. Temporary work zone
      1. Channelizing devices
      2. Proper signage
      3. Appropriate spacing
      4. Sequencing of zones
    - ii. Procedures
      1. Installation sequence
      2. Use of law enforcement
      3. Traffic control device selection
6. Traffic zones
  - a. Advanced warning area
  - b. Transition
  - c. Activity
  - d. Termination
7. Traffic control: safety guidelines
  - a. Zone warnings
  - b. Separation

- i. Worker
    - ii. Motorist
  - c. Pedestrian guidance
- 8. Work zone tapers
  - a. Types
    - i. Merging
    - ii. Shifting
    - iii. One lane/two way
    - iv. Downstream
    - v. Shoulder taper
  - b. Tapers and flashing arrow panels
    - i. Merging function
    - ii. Panel selection
      - 1. Size
      - 2. Light configuration
    - iii. Determination of locations
  - c. Merging taper lengths
    - i. Less than 40 miles per hour (mph)
      - 1. Width times speed squared
      - 2. Application
    - ii. Greater than 45 mph
      - 1. Width times speed squared
      - 2. Calculations
    - iii. Smooth transitions
  - d. Roadway sign categories
    - i. Regulatory
    - ii. Guide
    - iii. Warning
- 9. Roadway sign uses
  - a. Regulatory
    - i. Speed
    - ii. Stopping
    - iii. Yield
  - b. Guide
    - i. Detour
    - ii. Route markers
    - iii. Informational
  - c. Warning
    - i. Road construction
    - ii. Narrowing lanes
    - iii. Merge
    - iv. Flagger
- 10. Channel devices
  - a. Types
    - i. Cones
    - ii. Barrels
    - iii. Barricades
    - iv. Concrete barrier walls
  - b. Uses
    - i. Night work
    - ii. Guidance
    - iii. Hazard indicators
    - iv. Road closures
    - v. Separation of motorist and worker
- 11. Placement
  - a. Roadway signs
    - i. Spacing
    - ii. Distance

- iii. From edge of road
- iv. Height above roadway
- b. Channeling devices
  - i. Positioning
  - ii. Device intervals
  - iii. Speed limits
- 12. Traffic maintenance drawings
  - a. Highway standards
    - i. Signage requirements
    - ii. Channeling devices
  - b. Sectional drawings
    - i. Barricade construction
      - 1. Dimensions
      - 2. Materials
      - 3. Device uses
    - ii. Sign placement
      - 1. Height above roadway
      - 2. Curb distance
    - iii. Details
      - 1. Time constraints
      - 2. Control personnel
      - 3. General notes
      - 4. Special considerations
  - c. Barrier walls
    - i. Material
    - ii. Dimensions
    - iii. Placement
    - iv. Time frames
  - d. Control drawings and traffic zones
    - i. Work location
    - ii. Lane dimensions
    - iii. Access and exit ramps
  - e. Estimates
    - i. Materials
      - 1. Base material
      - 2. Stone
      - 3. Asphalt
      - 4. Paint
    - ii. Equipment
      - 1. Signage
      - 2. Flashing arrow panels
      - 3. Barrier walls
      - 4. Cones, barrels, and barricades
- 13. Highway environmental hazards
  - a. Terminology
    - i. Environmental hazards
    - ii. First responder
    - iii. DEET
    - iv. Permethrin
    - v. Lyme disease
    - vi. Rocky Mountain spotted fever
    - vii. West Nile fever
    - viii. Neurotoxin
    - ix. Cytotoxin
    - x. Hematoma
    - xi. Nausea
    - xii. Glyphosate
    - xiii. Carcinogen
    - xiv. PCB

- xv. Pathogen
  - xvi. HIV
  - xvii. Epidemiology
  - xviii. Jaundice
  - xix. Impervious
  - xx. Tuberculocidal
  - b. Hazardous vegetation, infectious insects, and fauna
    - i. Hazardous vegetation
      - 1. Poison ivy
      - 2. Eastern oak leaf poison ivy
      - 3. Western oak leaf poison ivy
      - 4. Poison sumac
    - ii. Infectious insects
      - 1. Bees
      - 2. Wasps
      - 3. Hornets
      - 4. Yellow jackets
      - 5. Mosquitoes
      - 6. Chiggers
      - 7. Ticks
      - 8. Spiders
      - 9. Scorpions
14. Fauna
- a. Wildlife
  - b. Snakes
    - i. Copper heads
    - ii. Rattle snakes
    - iii. Water moccasin
    - iv. Coral
15. Initial treatment
- a. Snake bite
    - i. Stabilize victim
    - ii. Locate bite below heart
    - iii. Apply constrictive bandage
    - iv. Mechanical suction
  - b. Insect bite
    - i. Cold compress
    - ii. Avoid scratching
    - iii. Apply lotion
    - iv. Keep bite area below heart
    - v. Remove stinger
    - vi. Artificial respirations
  - c. Poisonous plants
    - i. Remove clothing
    - ii. Wash with soap and water
    - iii. Apply alcohol
    - iv. Seek medical advice
16. Hot/cold environments: effects and treatment
- a. Environments
    - i. High heat—dehydration
    - ii. High humidity—decreased sweating
    - iii. Cool and damp—loss of body heat
    - iv. Hot materials—higher body temperature
    - v. Cold—frostbite
  - b. Treatment
    - i. Drink fluids
    - ii. Seek shade
    - iii. Air conditioning
    - iv. Frequent breaks

- v. Avoid alcohol
  - vi. Loose fitting clothes
  - vii. Avoid caffeinated beverage
17. Blood pathogens and avoidance
- a. HIV
  - b. HBV
  - c. Avoidance
    - i. Skin contact
    - ii. Cover wound
    - iii. Avoid sharp objects
    - iv. Sanitize
    - v. Dispose of items
    - vi. PPE
    - vii. Hand washing
    - viii. Sterilization
18. First responder training
- a. American Red Cross
  - b. Initial treatment responders
  - c. Proper training
  - d. Restricted treatment
  - e. Victim permission
  - f. Explain treatment
  - g. Contact advanced medical teams
  - h. Enlist bystander help
  - i. Reassure/calm victim

**Resources Other**

1. LIUNA Training and Education Fund. *Highway Workzone Safety*. Current. Pomfret CT; LIUNA Training and Education Fund, 2006.
2. Ohio Department of Transportation Office of Traffic Engineering. *Ohio Manual of Uniform Traffic Control Devices*. Current. Columbus, OH; Ohio Department of Transportation Office of Traffic Engineering, 2006.
3. Texas Transportation Institute. *NCHRP Report 553 Crash Worthy Work Zone Traffic Control Devices*. Current. College Station, Texas; Texas Transportation Institute, 2006.
4. <https://www.workzonesafety.org/training/work-zone-traffic-control-safety-certification> (<https://www.workzonesafety.org/training/work-zone-traffic-control-safety-certification/>)[www.dot.state.oh.us](http://www.dot.state.oh.us). (<http://www.dot.state.oh.us>)2020.

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