

ZDA exam topics and resources - Part 1

Topics

- Classification of all sensors according to FHWA handbook
- Traffic flow parameters – definition, expression, units, dependencies
- Physical principles and laws of detection
 - Magnetic parameters (flux, lenz law, ...) – definition, expression, units
 - Electric parameters (Inductance, capacitance, reluctance, ...) – definition, expression, units
 - Quality parameters (sensitivity, quality factor, ...) – definition, expression, units
- Intrusive and Non-intrusive detectors (for all detectors)
 - Physical principle (how does it work?) – describe what is exactly the cause of detection (changing physical quantity? Why?)
 - Configuration – explain different designs, placement and installation
 - Use of the detector – where, why?
 - Measured values by the detector – what, how?
 - Advantages and disadvantages of the detector
 - Installation, maintenance and indirect costs
- Comparison of detection technologies according to FHWA.

Resources

- FHWA. (2000). [INITIAL EVALUATION OF SELECTED DETECTORS TO REPLACE INDUCTIVE LOOPS ON FREEWAYS](#). Texas. (Some information on Inductive loops and thorough research on 3M microloops compared to video sensing systems)
- FHWA. (2006). [Traffic Detector Handbook: Third Edition—Volume I](#). McLean. (Exhaustive on inductive loops and other intrusive technologies. Consists of parts on sensor technology, and applications. Very useful for part 1)
- FHWA. (2006). [Traffic Detector Handbook: Third Edition—Volume II](#). McLean. (Installation, maintenance, theory and failure causes of inductive loops. Also some brief information on other intrusive and nonintrusive technologies.)
- VDC. (2007). [A Summary of Vehicle Detection and Surveillance Technologies used in ITS. New Mexico](#). (Up to date summary of traffic sensing technology that updates vendors and products of different technologies, description and comparison is taken from Traffic detector handbook, useful for parts 1 and 2.)

Video resources

- Traffic Detector Video Training Course Part 1 - [Detector Theory](#)
- Traffic Detector Video Training Course Part 2 - [Detector Design](#)
- Traffic Detector Video Training Course Part 3 - [Detector Installation](#)
- Traffic Detector Video Training Course Part 4 - [Detector Maintenance](#)
- [Better Inductive Loop Detectors](#) - very nice educational video