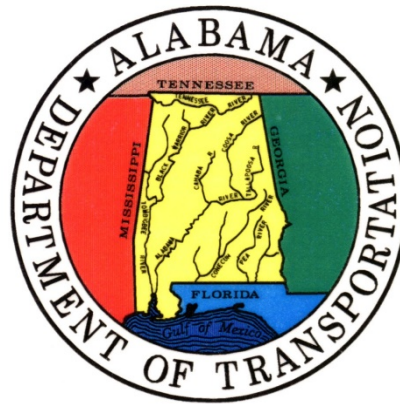


Highway Work Zone Intrusion Alert Systems Implementation Guide

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July 2017



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Introduction

Adopting new technology and innovation is vital for governmental entities to effectively conduct business for its citizens. One major challenge of capturing and realizing the multitude of benefits produced by innovative safety technologies is proper implementation of such systems. This guide provides recommendations and best practices for implementing proximity detection and alert systems for enhancing safety for workers in highway construction zones.

Highway construction zones of transportation infrastructure provide unique challenges for ensuring the safety of ALDOT personnel. Construction equipment and ground workers are often required to operate at close proximity to traveling vehicles.

Highway work zone intrusion alert systems can provide real-time alerts to pedestrian workers and equipment operators when a hazard is present. Through wireless communication through various technologies and systems, work zone intrusion alert systems can provide alerts to highway work zone personnel when hazardous situations are detected.

This guide was created in an effort to effectively implement highway work zone intrusion alerts systems for ALDOT personnel. For proper implementation, several steps were created and discussed in this report. Figure 1 presents the steps for implementation. Subsequent sections of this guide book describe in detail the best practices for each implementation step shown in Figure 1.

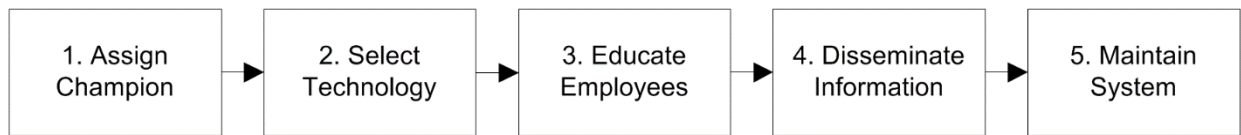


Figure 1: Steps for Implementation of Work Zone Intrusion Alert Systems

Step 1: Assign Champion

One of the most effective steps in implementing a highway work zone intrusion alert system for enhancing safety in highway work zones is to designate a “champion” of implementing the system. The selected champion is an employee of ALDOT that is familiar with implementing systems or technologies. This person must be committed to implementing the selected technology. Although the champion may have other responsibilities, implementing this system should be one of the person’s top priorities. The champion should have the following characteristics:

- 1) A basic understanding of the challenges of safety with ALDOT employees in a highway work zone
- 2) Past experience with implementing systems within an ALDOT environment
- 3) A desire to understand highway work zone intrusion alert systems

Before other steps of the implementation process, the champion must fully understand the highway work zone intrusion alert systems. The champion must read this guide and create a plan based on best practices presented.

Step 2: Select Technology

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Based on results of the review and experimental evaluation, the research team has several recommendations for selecting and implementing work zone sensing technology. The research team recommends implementing the Intellicone for longer tapers in construction highway work zones where traffic barrels or other longer term temporary devices are implemented. The Traffic Guard Worker Alert System is recommended for short tapers and short term or mobile highway work zone projects. For long term highway work zone projects requiring heavy pieces of construction equipment, the AWARE System is recommended. This system requires the most infrastructure but provides the best opportunity for alerting highway work zone personnel during a work zone intrusion. Each manufacturer provides specific step-by-step instructions on how to deploy and maintain the highway work zone intrusion alert systems. Table 1 provides a selection guide for work zone intrusion detection devices.

Table 1 Selection Guide for Work Zone Intrusion Detection Devices

Situations	Intellicone	Traffic Guard Worker Alert System	AWARE
Longer than one day	X		X
One day or shorter		X	
Mobile operation			X
Taper longer than or equal to 1,500 ft.	X		X
Taper shorter than 1,500 ft.		X	

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Step 3: Educate Employees

After assigning an implementation champion and selecting a highway work zone intrusion alert system, end users of the system must be educated. ALDOT employees who work in highway work zones should be instructed about the value work zone intrusion alerts, functionality of the systems, and how to maintain the devices. This educational component can be integrated into existing ALDOT employee training and should be tailored towards those employees who will be the end users of the systems - ALDOT personnel in highway work zones. The training must include the following: 1) Instructions and demonstrations of how to set-up the system including mounting locations for all devices, 2) properly calibrate the system to the desired alert distance, and 3) explain the functionality of the system during use. The champion should create and organize the training materials as well as conduct the training for the employees. Several sets of highway work zone intrusion alert systems should be available for demonstration by the employees after the information is given. After all employees have received the required training, the systems should be deployed in initial field trials before extending to all active work zone projects.

Step 4: Disseminate Information

Once the system is deployed in an initial field trial, workers using the system should be surveyed. Employees should be questioned about their ability to use the system, encountered limitations, and suggested changes. Changes to the education, calibration, and other variables should be made by the champion based on the results of the initial trials. Feedback from employees should be acted on and communicated to the workers because they will be the end users of the system.

Step 5: Maintain System

The champion should implement strategies to maintain the highway work zone intrusion alert system. These strategies should include requiring workers to make sure the battery status before deployment; change of battery requires a simple replacement of battery, maintain and requirements for updating training for workers utilizing the system. Workers should be re-trained or updated at least every year for usage of the highway work zone alert system.

Conclusion

By implementing a highway work zone intrusion alert system, pedestrian workers in Alabama's work zones can be alerted when they are located near a hazard. This guide provides best practices associated with implementing and maintaining a highway work zone intrusion alert system. This guide is a complimentary document to the project research report that contains experimental field trials and results of the alert systems. This technological system as well as others can provide an additional layer of safety protection for ALDOT personnel in hazardous work environments.