

# MODULE 10: INTELLIGENT TRANSPORTATION SYSTEMS: SMART WORK ZONES

## LESSON 4: PUTTING IT ALL TOGETHER WORK ZONE ITS SYSTEMS

Connected vehicle (CV) safety applications are designed to increase awareness of what is happening in the environment as people drive, walk, or bike within our transportation system. In this lesson, students will think about how ITS technologies in a work zone could improve safety for both the driver as well as highway workers. Students will design an ITS system and describe how this system would work incorporating their Smart Suit technology.

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# Lesson 4: Putting It All Together

## -Work Zone ITS Systems

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<b>Grade Level:</b> Adaptable to Grades 6-12	<b>Lesson in this Module:</b> 4 of 4
<b>Time Required:</b> 60 minutes	<b>Lesson Dependency:</b> This builds on lesson 3 and the materials listed in Lesson 1
<b>Keywords:</b> transportation engineering, intelligent transportation systems, e-textiles, 'smart suit' technology	

### Materials List (From Lesson 1 of this Module)

LilyPad Arduino ProtoSnap Development Board, Highway Safety Attire (helmet, vest, pants, gloves), Mini USB cable, Felt, Fabric Marker, Needle Threader, Seam Ripper, Velcro

### Pre-Requisite Knowledge

Must Complete Lessons 1, 2 and 3

### Lesson 4 Activities

In this lesson, students will think about how ITS technologies in a work zone could improve safety for both the driver as well as highway workers. Students will design an ITS system and describe how this system would work incorporating their Smart Suit technology.

- **Activity 1: Presenting Smart Suit & ITS Technologies (20 – 30 minutes)**

**Presentation:** Once students have finished each piece of the Smart Suit, have them demonstrate and explain for the class how they developed their suit component and how it would work. Once all students have presented each component, consider having a student model the Smart Suit and discuss how each component of the suit works together.

- **Activity 2: Designing an ITS System with Smart Suit Technology (30 – 45 minutes)**

Think about work zone hazards that exist to both drivers and work zone personnel. There are many ITS systems already available for transportation personnel to utilize to improve traffic flow and safety through a work zone area. Consider the use of the “Smart Suit” you designed for a highway worker. What technologies have you developed and how could these technologies be incorporated into a larger ITS system to improve both driver and worker safety.

**Using poster board, crayons, colored, pencils, and other art supplies, sketch a work zone area that utilizes ITS technologies and describe how these technologies would work to improve both driver and worker safety. Consider the idea of a “Smart Suit” and how the technologies associated with the suit could be incorporated into the larger ITS system.**

***Teacher Directions:** In this activity, students can work as a class to sketch and describe their ideas of how a work zone ITS system would operate. To help students, the teacher may ask questions such as “What is a potential hazard in the work zone area?” “What technologies could improve this hazard?” “How would these technologies work?” “What could be done to improve worker visibility?” “How could oncoming traffic be alerted to the presence of a worker?” “What other technologies would work in conjunction with the Smart Suit design?”*