

MODULE 9: DYNAMIC MESSAGE SIGNS USING MAKEKEY MAKEKEY

GRADE LEVEL: 6 - 12

Dynamic Message Signs (DMS) use active, changeable displays to enhance roadway safety as part of an intelligent transportation system (ITS). An ITS does not always have to be a large, complex, and expensive system. Sometimes a single DMS with warning lights or a driver feedback display can make a positive difference when strategically applied. DMS are very conspicuous by their active and attention capturing nature and are best applied as a roadway safety enhancement at high-hazard locations or at high priority speed violation locations.

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Dynamic Message Signs

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| Grade Level: 6 - 12 | Tasks in this Module: 7 |
| Time Required: Depends on student level | Lesson Dependency: Module 8 |
| Keywords: Dynamic message sign, intelligent transportation system, connected vehicle, sensor, Makey Makey | |

Materials List

Makey Makey Kit, aluminum foil tape, scissors, foam, cardboard, poster board, rubber bands, various art supplies

Pre-Requisite Knowledge

Students must complete Module 8 in order to complete Tasks 6 and 7 in this Module.

Learning Objectives

Following a series of tasks, students will design a hazardous intersection that could be encountered by drivers. They will use a Makey Makey circuit board to create a Dynamic Message System that will alert oncoming traffic to the dangerous intersection ahead

- Students will create a simple sensor using the Makey Makey circuit board which will be used to simulate a Dynamic Message Sign.
- Students will then learn how to connect and program the Makey Makey circuit board to allow the sensor to interact with oncoming traffic.
- Students will use a free internet-based programming software called **Scratch** to program a sensor. **Scratch** is compatible with the Makey Makey circuit board.
- Students will learn how to add sound clips to their **Scratch** program to create an interactive sensor.

- Students will learn how to add a free downloadable sound to their **Scratch** program for their interactive sensor.
- Students will use the interactive sensors created here as well as the MOSS Connected Vehicle designed in previous activities and build a model of an Intelligent Transportation System Highway that includes a Connected Vehicle and a Dynamic Message System.

Introduction/Motivation

Dynamic Message Signs use active, changeable displays to enhance roadway safety as part of an intelligent transportation system (ITS). An ITS does not always have to be a large, complex, and expensive system. Sometimes a single DMS with warning lights or a driver feedback display (i.e., a display that tells the driver how fast he or she is going) can make a positive difference when strategically applied. Driver feedback displays are much more effective in bringing about speed compliance than standard static roadway signs.

DMS may be used in school zones and as a way to provide curve warnings, identify or warn of upcoming pedestrian crossings, provide speed warning, alert drivers to upcoming work zones, and more. All of these applications use a combination of technologies and devices to create an active warning display for drivers. DMS are very conspicuous by their active and attention capturing nature. They are best applied as a roadway safety enhancement at high-hazard locations or at high priority speed violation locations.

In this STEM lesson, you will simulate Dynamic Message System that is able to communicate important information to drivers as they approach a hazardous intersection.

Associated Activities

The activities/tasks in the worksheets are design to be self-paced or completed as a group. Once groups have completed each task, they can raise their hand and you can check off each task at the bottom of each activity page. Students should pay attention to the information in each task as they will be using the information gained to design and model of an Intelligent Transportation System Highway that includes a Connected Vehicle and a Dynamic Message System.