Agenda

- Introductions - 5 minutes

- Overview of ISA-TOPE Project - 10 minutes

- Sharing and Discussion of Developed Curriculum - 20 minutes

- Review of Other Resources Available from ISA-TOPE Project - 5 minutes

- Q&A and Wrap-up - 5 minutes

Carl

Introductions

- Carl Borleis

- Shannon Mohn

- Forrest Brownlee

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Overview of ISA-TOPE Project

- What is ISA-TOPE? (What's in a name?)
- Lessons Learned
  - Comfort Level of Instructors
  - Industry Buy-in and loyalty
  - Changing Technology/Increasing cost
- Best Practices
  - "Can I Borrow That?"
  - Finding/Involving Outside SMEs
  - Capitalizing on existing partnerships
    - ASE
    - AED
    - NSF/ATE/Mentor Connect

Developed Curriculum

- Truck Curriculum - Maintenance/Repair

- 18 Task Sheets

- 4 Power Points

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KSA's - Truck

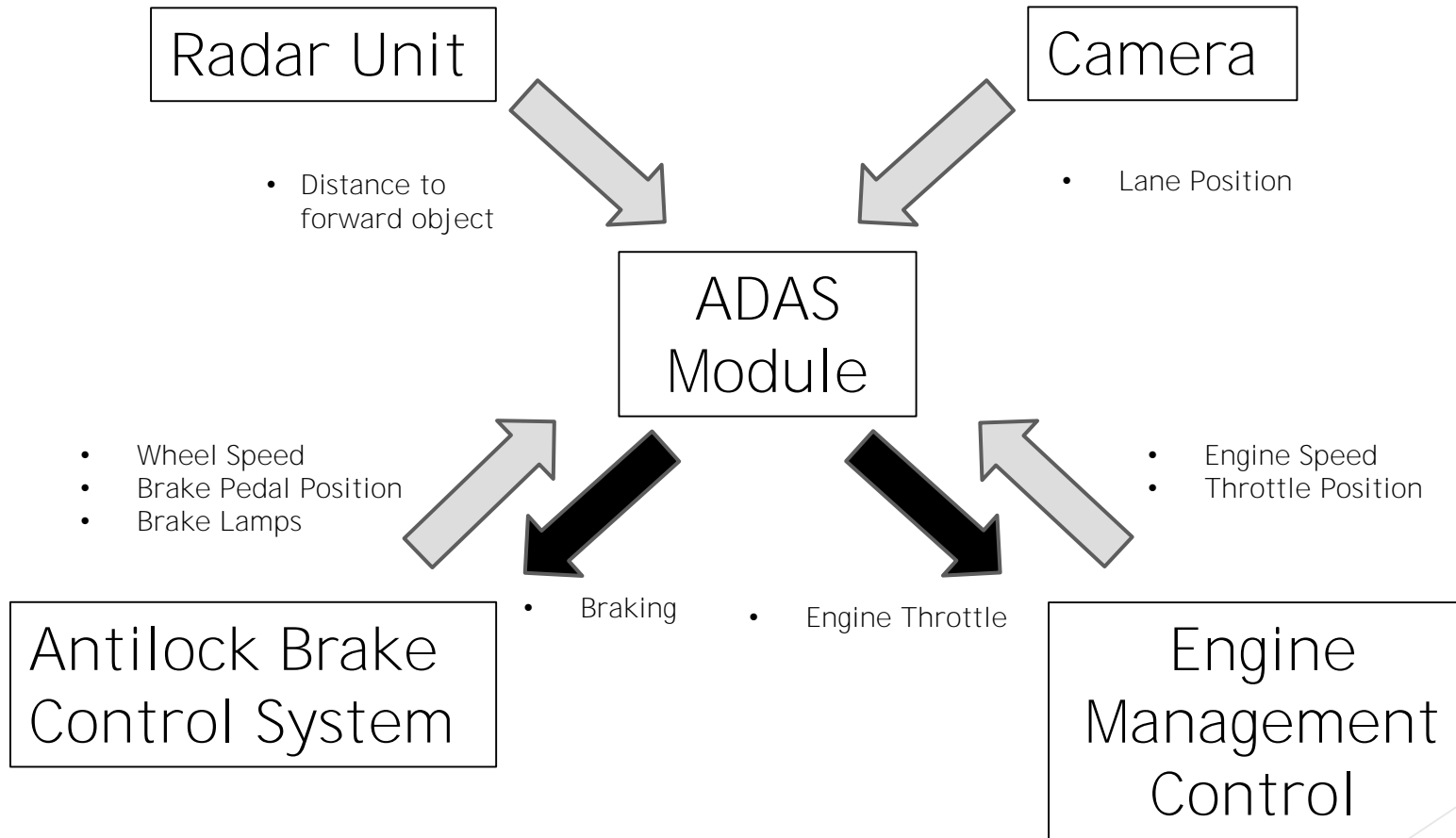|					
Module 1: Introduction to ADAS Systems	Research specific vehicle and demonstrate knowledge of how the ADAS system works on it. Identify the various switches and instrument panel indicators that are ADAS related.	Identify the location and describe the operation ADAS components, such as: radar, lidar, cameras, ultrasonic semsors, related modules, etc.	Demonstrate knowledge of which other systems are related to ADAS (ex. ABS, ECM, etc.).	Perform a vehicle inspection (pre-service), paying special attention to ADAS components.	Identify what conditions or situations would cause a technician to perform a calibration.
Module 2: ADAS Networks	Describe how ADAS related modules communicate data.	Describe the different components of a network. Wires, resisters, modules, gateway, diagnostics.	Demonstrate performing network tests, resistance checks, perform scope checks of networks.	Perform repairs within the network wiring, identify and replace terminating modules/resisters.	Diagnose ADAS circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action
Module 3: ADAS Components	Describe the inputs and outputs of the ADAS control system.	Describe the function of all ADAS components and what type of signal they produce/receive.	Diagnose the component and root cause of an ADAS failure.	Repair or replace components in the ADAS system. Properly mount and replace components.	Perform any module programming needed for component replacement.
Module 4: Diagnostics, Repair, & Calibration	Perform ADAS Calibration following manufacturer sequence.				

Legend:	Knowledge	Skills	Ability

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Radar

- **Radar has been around since before World War 2.**
- **You may know it best when hearing about aviation. It works by emitting radar waves that bounce off objects, and the waves that come back will generate an image of what the object is. Radar can also judge distance based on the time it takes for the signal to return and whether it is moving towards or away.**

Emitted wave

Transmitter/
Receiver

Target

Reflected wave

— Distance —

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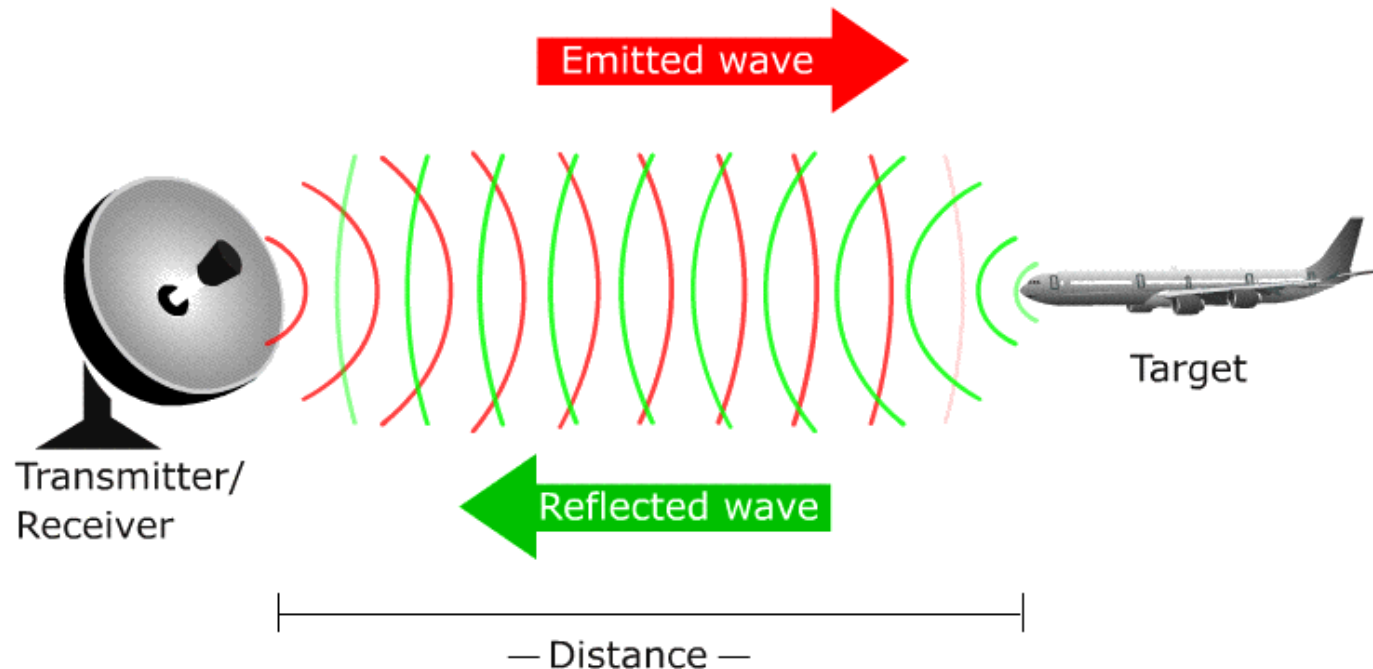
Example of Embedded Video in PowerPoint
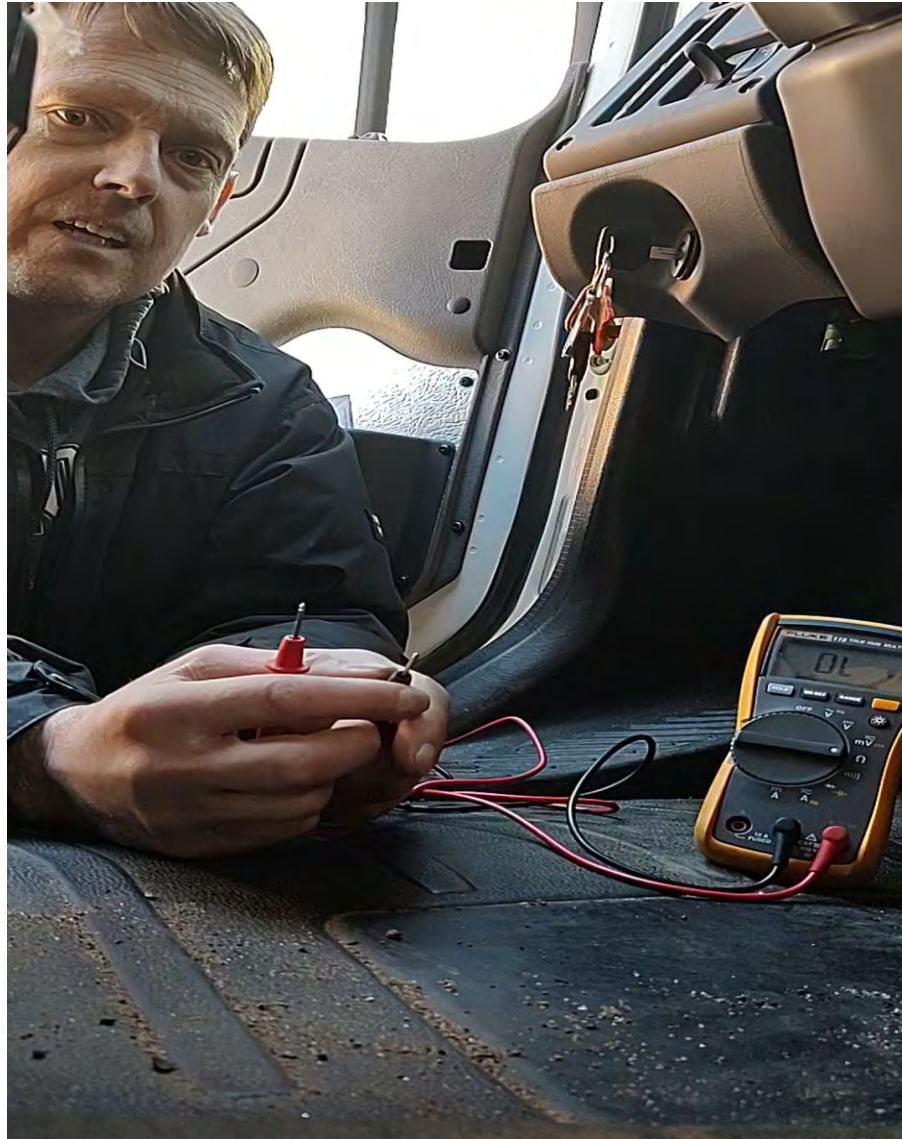
Developed Curriculum

- Truck Curriculum - Operation

- 2 Lesson Plans

- 1Power Point

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Operation - Crash Mitigation System (CMS)

Should work automatically once vehicle is **above 17 MPH; display changes from "NO CMS" to "CMS"**

Info on display is color coded:
Blue = no vehicle detected ahead
Green = vehicle detected - safe distance
Yellow = vehicle detected - caution
Red = vehicle detected - system activated

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Operation – Lane Alert

https://youtu.be
/LVCArsoXhSg

Developed Curriculum

- Equipment Curriculum

- 6 PowerPoints

- 10 Task Sheets

KSA's - Equipment

|	Knowledge	Knowledge	Skills	Ability	Ability
Module 1:Introduction to Autonomous Systems	Demonstrate knowledge of how the AOAS system works on a particular vehicle.	Identify the following components:	Demonstrate knowledge of which systems are tied together.		
Module 2: Autonomous Systems Networks	Describe how modules talk on a network and the benefits of having a network	Describe the different components of a network. Wires, resisters, modules, gateway, diagnostics	Demonstrate performing network tests, resistance checks, perform scope checks of networks.	Perform repairs within the network wiring, identify and replace terminating modules/resisters.	Perform Reprogramig of a network module
Module 3: Autonomous Systems Components	Describe various inputs and outputs of the AOAS system	Describe the function of all AOAS components and what type of signal they produce/receive	Perform Diagnostics to properly Diagnose the component and root cause of failure.	Repair or replace components in the AOAS system. Properly mount and replace components	Perform any module programming needed for component replacement
Module 4: Diagnostics, Repair, & Calibration	Understand the reasoning behind calibration and the importance of a proper calibration				

Legend: **Knowledge**   **Skills**   **Ability**

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Terms to understand

▶ 2D sensors - relating to elevation and slope

▶ LR 410 - laser receiver detects laser plane for height reference

▶ CB450 - control box may be used with 2D or 3D systems with correct harnesses
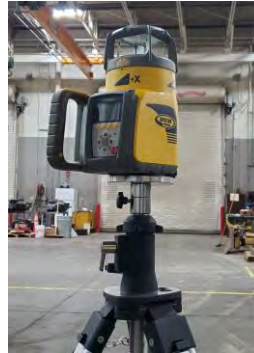
Note : for detailed product information, access to the following is required:
❖ Cat Sis Web 2.0
❖ Trimble Learn

Things learned on the equipment

▶ Need to have a good understanding on running and operating

▶ Understand how the 2D system works with machine

▶ When you understand how the machine and attachment work

▶ Then you can bug, and trouble shoot the machine and equipment

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Equipment Technician

Task Sheet 1.5	Benching and running the 2D system
Objective	In this task sheet you will Bench and run the 2d system
Tools and Equipment Needed	You will need to have completed tasks 1-4

NAME _____

Year/Make/Model of equipment Being Worked on

_____

1. Start the machine and bring the blade to your reference mark. What are you accomplishing when you bench the blade?

2. After the blade is benched what are the 2 functions of this system?

-

3. Run function 1. describe how the box blade functions

4. Run function 2. describe how the box blade functions

Running the 2D system

▶ After installing the receivers and CB450 controller.

▶ Find a suitable spot for the laser and tripod.

▶ Start the laser adjust and let the laser self-level

▶ Power up the machine and adjust the receivers so the laser is hitting them center (solid red light if you're too low it will be a slow flash if to high it will be fast)

▶ Now you're ready to Bench the machine!

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2D and Laser Systems

- ## 2D refers to elevation and slope
  - Laser Receivers provide the elevation on machines that are set up and configured to use them.

Developed Curriculum

- How to gain access

- TCOE Website

- ATE Connect

- NCAT website

- Contact ISA-TOPE staff

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Resources Available from ISA-TOPE

- Truck
- Track Loader
- Laser units
- Equipment Diagnostic Tools
- Other Can I Borrow That
- TCOE Website

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ISA-TOPE Going Forward

- How will "Can I Borrow That?" evolve? Workshops?
- ISA-TOPE 2.0
  - Electric?
  - Newer technology (Cascadia)?
  - Different professional development model
  - Broader scope (additional sectors)?
  - Additional partnerships (Schools)
    - In-State
    - Surrounding states

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Questions?

Get in touch.

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