Knowing What You Need to Know, and Making Sure They Hear It

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Challenge of Rural Operations

- Gathering near real time information is a challenge for any rural transportation operation.
- One of the largest pieces of information needed is weather information.

It’s All About the Ground

- We have radar and satellites to fill in the gaps, but for surface transportation impacts we must really have ground observations.
- What is available to meteorologists and operations?
  - Airports
  - Buoys (in large bodies of water)
  - Ships (in large bodies of water)
  - Road Weather Information Systems (RWIS)
- Additional for Road Operations:
  - Other Garage/Sheds/Barns
  - Highway Patrol
  - In field Vehicles
  - Other Points

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A Simple Factor of Distance

- Weather can be very localized
  - Winter (Snow, Ice)
  - Thunderstorms (Heavy Rain)
- Add in geographical effects that can make it worse:
  - Mountains
  - Lakes
  - Coastal Areas
- This means your weather is usually not uniform, so you have to find ways to increase your knowledge.

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What Can We Do?

- From our list earlier there is only two observation system we can increase or improve:
  - RWIS
  - In field vehicles

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Ways to Increase RWIS with Tough Budgets

- When thinking “low-cost” weather station do not think miniature version – think key features only
  - Air/Pavement temperature
  - Road Condition
  - Video Camera
- Increase your return on investment
  - RWIS has many year-round applications
  - Select sites were RWIS can actively warn

  (Site selection becomes even more critical)

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Improve Another Source: In Field

- Agency vehicles offer a great way to expand your weather information.
- Power is already there and you might even have the communication and equipment.
- Turn your vehicles into mobile weather stations
    1. Equip the vehicles with inexpensive mobile weather sensors such as the Vaisala Surface Patrol or Surface Patrol HD
    2. Connect to AVL system
    3. Collect and display mobile weather data
- Current Challenges
    - Communication can be a real challenge for rural operations
    - Display software choices are extremely limited

How do We Inform?

- Another challenge or rural operations is informing motorist.
- The last fifteen years as brought an explosion in new technologies and solutions that allow us to information motorists
  - VMS
  - 511
  - Web sites
  - Personal Navigation Systems
  - On-board technology (Navigation, XM, OnStar)
  - Text messages

- All of them offer some great advantages. A motorist that has access to these can be very knowledgeable about their route.

New Technology also Creates New Challenges

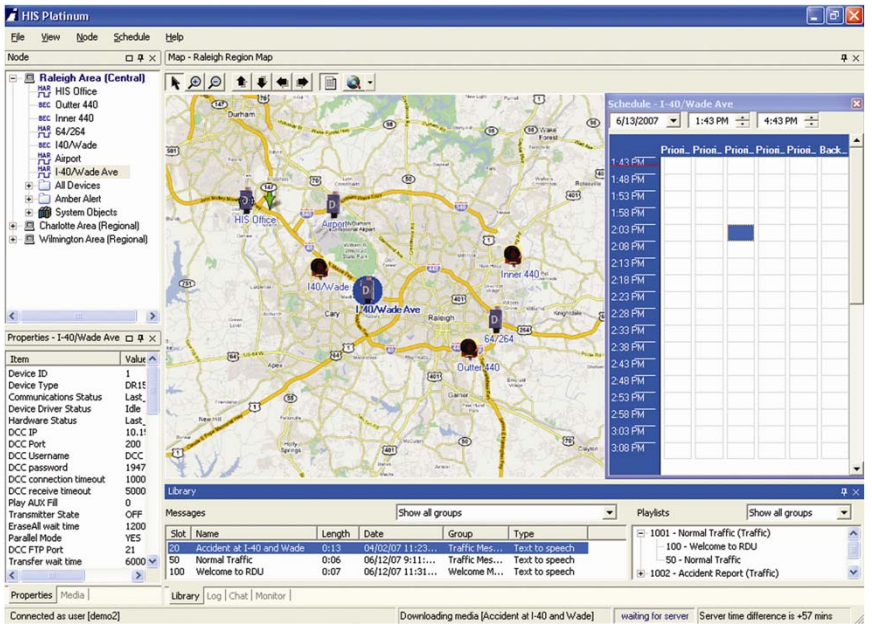
- Much of the solutions require the need for cell service. This network is still very unreliable during mass disasters. (i.e. Minneapolis bridge collapse, recent earthquake in East Coast)
- Many of the technologies involve drivers using cell phones while driving. Sending a conflicting message with the push to avoid distracted driving.
- Many of the solutions require driver to have purchased additional equipment or service (cell phone, navigation system, etc.). This is not penetrating enough motorists.

Proven Technology

- Until those technology hurdles are overcome Highway Advisory Radio (HAR) must remain a part of the traveler information network.
  - Every car in North America still comes with an AM radio standard
  - Flashing beacons or VMS can notify motorist to turn on radio
  - Causes least amount of distraction
  - No impact caused by amount of users
  - Volume of information that can be relayed is unlimited

Vaisala Communication Control Software

- Software system that allows for data management, communication and viewing of transportation communication equipment
- Software allows for full control of HAR by monitoring, creating and changing broadcast messages
- Intuitive graphical user interface:
  - Graphical map display
  - Creation of messages and playlists
  - Scheduling of messages
  - Quickly see the configuration of all devices and group
  - Make individual or global commands



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Vaisala's Unique HAR Solutions

Fixed Station

VMS/HAR Combination

Mobile Station

- **Low Power AM Transmission Station**
  - Licensed by the FCC (90.242) to government entities only
  - License Requirements:
    - For public information (no commercials, no music)
    - Can not exceed 10 watts
    - Field strength can not be greater then 2mv/m at 1.5 Km (0.93 miles)
- **Typical Coverage (Flat Open Terrain)**
  - Fixed: 3-5 mile radius (6-10 Km)
  - Mobile: 2-3 mile radius (4-6 Km)
  - Synchronized HAR Array: Unlimited coverage area
- **Four Basic Configurations**
  - Fixed station
  - Mobile station
  - VMS and HAR combination
  - Semi-Permanent Quick Disconnect
- **Broadcast Frequency Range**
  - 530-1700 kHz

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Thank You
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