# ITS Training Program

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HAR systems are used to inform motorists of special events or conditions that may affect traffic. Each HAR has a transmitter station and flashing beacon signs.
Schedule

- 12:45 – 2:45  Presentation of Course Materials
- 2:45 – 3:15  HAR Demo
- 3:15 – 4:00  Workshop
- 4:00 – 4:30  Test on Module 5
Highway Advisory Radio

... Purpose and Need

- Audio information dissemination
- Advise motorist of potentially hazardous traffic ahead
- Special event information
- Construction information
- Alternate route information

Inform motorists of incidents, special events, construction or other related information.
Highway Advisory Radio

... Potential Benefits

- Reduce Secondary Accidents
- Reduce Travel Delay
- Appropriate/Fast Response to Incidents
- Proactive Traffic Management
- Low Cost Solution for Information Dissemination

HAR enables Traffic Management Centers a means of disseminating information to drivers before they encounter delays and add to the traffic problems.
Specifications

- FCC Rules and Regulations
- Transmitter
- Digital Recorder / Player
- Antenna
- Performance Characteristics
- Ground System
- Power System
- HAR Alert Signs
- Communication
Transmitter

- Follows FCC Regulations
- 10 Watts
- Speech Limiter Control Modulation
- Audio Response
- Distortion and Noise
- Additional Inputs
- Power Requirements 10-14 VDC
Digital Recorder / Player

- **Programming Methods**
  - Local – Telephone Style Handset
  - Remote – Phone Line or Cellular

- **Broadcasting Modes**
  - Scheduled
  - Emergency
  - Automatic
Digital Recorder / Player (contd.)

- Message Capacity
  - Message Library Capacity
  - Playlist Capacity
  - Recording Time
- Auxiliary Interfaces
  - RS-232
  - Parallel Port
  - Digital Inputs
  - Digital Outputs
- Power
Antenna

- Utility Pole
  - Class 4 or 5
  - Height 30’ – 40’
- Antenna
  - Anodized Aluminum
  - Height 15’ – 25’
- Combined
  - Max. Height allowed by FCC 49’-2”
- FAA Approval – within 5 mi. of Airport
Performance Characteristics

- AM (amplitude modulation)
- Broadcast Zone
- Flashing Beacons
- Flat vs. Rough Terrain
  - Flat – 5-8 miles
  - Rough – 1-5 miles
Site Selection

- Desired Coverage Area
- Terrain
- Sign Placement
- Utility Needs
- Property Approvals
Grounding System

TRIAD Ground System

- Approx. 10’ Copper Pipes
- Pipes spaced approx. 3-5’ apart
- Pipes are filled with 3 parts sand, 1 part copper sulfate
- Copper caps are soldered to ends of the pipe
Power System

- Antennae
  - Hardwire
  - Solar
  - Battery backup

- Beacons
  - Hardwire
  - Solar
  - Battery backup
HAR Alert Signs

- Text Message
- Frequency
- Flashing Beacons
- Permanent vs. Portable
Communications

- Computer to Antennae
  - Telephone
  - Cellular
  - UHF or VHF Radios

- Antennae to Beacons
  - Pager Based System
  - Dial-Up System
  - AM Receiver-Based
Break
Operations
Highway Advisory Radio (HAR) ... Overview

HAR systems are used to inform motorists of special events or conditions that may affect traffic. Each HAR has a transmitter station and flashing beacon signs.
Highway Advisory Radio (HAR) ... Guidelines

- Operates 24 hours/day, 7 days/week.
- TMC Operators provide input via telephone access.
- Clear, concise and accurate messages.
- No inappropriate background noises.
- Use standard message format as much as possible.
Highway Advisory Radio (HAR)

... Message Priorities

- Public Safety
- Roadway closures/incidents in progress.
- Construction, Maintenance, Special Event & Public Service Announcements (PSAs).
Highway Advisory Radio (HAR) … Types of HAR Systems in ITS

- Fixed HAR System
  - Multiple Flashing Beacons Locations

- Potable HAR System
  - Single Location
  - Solar Powered
Highway Advisory Radio (HAR)

... Typical Applications

- Traffic Conditions
- Incident Management
- Road Construction
- Accident Notices
- Detours/ Alternate Routes
- Road Closures
- Hazards...e.g. Objects in Road
- Congestion Advisory
- Snow
- Safety Tips
- Work Zone Control
- Rock Slide Warnings
- Speed Limit Advisories
- Fog Driving Instructions
- Hazardous Spill Warning
- Weather Warnings
- Bridge Out
- Ice Warning (Black Ice)
- Traffic Lane Shifts
- Drawbridge Warning
- Weather Advisories
- Sports Events
- Concert Control
- Flood Area Alerts
- National Park Information
- Tourist Information
- Escaped Convict - Near Prison
- Conference/ Conventions
- State Fair Information
- Hospital/ Emergency Directions
- Service Locations
- Parking Availability at Malls/ Airports
- Special Community Events
- Historic Attractions
- School Closures
- Airport Arrivals/ Departures
- Multilingual Broadcasts
Highway Advisory Radio (HAR)

... Message Text

- Roadway affected.
- Direction, location and lanes impacted.
- Incident cause description.
- Delay duration and alternate routes.
Highway Advisory Radio (HAR)

... Message Text Example

“This is a special Highway Advisory Radio message being recorded at 7:15am on October 30th. There is a Tractor Trailer rollover on I-95 northbound at Exit 28 Davie Blvd. All lanes are closed. Motorists heading in this direction are advised to use I-595 Westbound, Exit 26A to Florida Turnpike Northbound as an alternate route to avoid delays. This message will be updated every 15 minutes or as required.”
Highway Advisory Radio (HAR)

... Message Update Frequency

- Maintenance – Daily
- Construction – Daily
- Incidents – At least every 15 minutes or when activities warrant.
Highway Advisory Radio (HAR) … HAR Do’s

- **Do** terminate calls to HAR by using proper steps.
- **Do** record in an area with minimum noise.
- **Do** speak clearly with an affirmative tone.
- **Do** keep information basic and correct.
- **Do** keep transmissions traffic related.
- **Do** keep info current - update as conditions change.
- **Do** log / communicate changes with other operators.
Highway Advisory Radio (HAR)  
... HAR Don’ts

- **Do Not** hang up in the middle of a session.
- **Do Not** record while in a noisy environment.
- **Do Not** mumble or speak low then loud.
- **Do Not** record detailed info for fires and accidents.
- **Do Not** use HARs for commercial/private use.
- **Do Not** keep old erroneous messages transmitting.
- **Do Not** keep information confidential.
Creating and Recording Messages
HAR System
Operational instruction for Highway Advisory Radio

- Opening HAR software
  - Double click on **DR2000A HAR Control** software icon on desk top.
  - HAR software will open with a default window.
Highway Advisory Radio (HAR) ... Broadcasting a Message

Operational instruction for Highway Advisory Radio

- Using DR2000A HAR Control
  - To view the status of the HAR stations, click on the “Station Status” icon. The “Station Status” window will appear.
  - Select the desired HAR Station by clicking once on the HAR Icon. This will display the current HAR Station Status and Station Schedule.
Highway Advisory Radio (HAR)  
... Broadcasting a Message

Operational instruction for Highway Advisory Radio

- Using DR2000A HAR Control to post an Emergency Message
  - Select the desired **HAR Station** by clicking once on the **HAR Icon**. This will display the current HAR Station Status and Station Schedule.
  - Using your mouse button, click on the **NOW Icon** in the Station Schedule dialogue box. This will add a Play List in the Station Schedule dialogue box.
  - In the Station Schedule dialogue box, click on the **Antennae Icon** until it turns **RED** stating **EMERGENCY** on the icon button.
Highway Advisory Radio (HAR)  
... Broadcasting a Message

Operational instruction for Highway Advisory Radio

- Using DR2000A HAR Control to post an Emergency Message
  - Select the "300" message library for Incidents by clicking once with your mouse.
  - Double click on an Empty message slot and the "Script Editor" will appear.
  - In the "Type in EVENT TITLE" field type in the title of your new message.
  - In the "Script for Message" field type in your Special Advisory message.
  - When finished, verify your message and when satisfied click on the "Floppy Disk" icon to save the text portion of your HAR message.
Using DR2000A HAR Control to post an Emergency Message

- With the Script Editor dialogue box still open, click on the “RED” button icon to start recording your voice message. Before recording, position the microphone in front of you and make the control room aware that you are recording a HAR message.
- When you have finished recording the HAR message, click on the “RED” button icon to stop the recording.
- To review your message, click on the “Review the Message” triangle icon in the Recording Manager dialogue box. The message will be played back so you can verify the content on the PC speakers. If the message is acceptable, click on the “Upload the message to the Library” icon. If it is not acceptable, click on the “Delete the message & start over” icon and repeat the recording process from the beginning.
Highway Advisory Radio (HAR) 
... Broadcasting a Message

Using DR2000A HAR Control to post an Emergency Message

- After clicking on the "Upload the message to the Library" icon the "Name Message" dialogue box will appear. Type in the title of your Special Advisory message and click the "OK" icon.
- When the recording process is completed, click on the "EXIT" icon to return back to the main default window.
Using DR2000A HAR Control to post an Emergency Message

- After clicking the exit icon, you will return to the main dialogue box. Select the message you just recorded in the “Message Library” and drag it into the “Station Schedule” dialogue box. The message will now be in the Emergency Playlist.
Highway Advisory Radio (HAR)  
... Broadcasting a Message

Using DR2000A HAR Control to post an Emergency Message

- The next step is to select the **"Flashing Beacons"** you would like to activate for this Emergency Message. Select all the available beacons for the effect HAR Station.

- Click on the **"Activate"** icon in the Station Schedule dialogue box which will send the message to the HAR Station and Beacons.
Using DR2000A HAR Control to remove an Emergency Message

- Once the event has been cleared the next step is to remove the message from the HAR Station and deactivate the Flashing Beacons.
  - To shut off the “Flash Becons” you must click on each one that is flashing. This will shut them off when activating the next Playlist.
  - Highlight the Playlist you wish to remove and the right click on it. This will bring a pull down menu on the screen. Select the “Delete” option which will remove the Emergency Playlist from the Station Schedule.
Highway Advisory Radio (HAR) … Broadcasting a Message

Using DR2000A HAR Control to post the original Playlist

- Select the “Playlist” you wish to send to the HAR Station by highlighting it.
- Then click on the “Activate” icon in the Station Schedule dialogue box which will send the message to the HAR Station and Beacons.
Highway Advisory Radio (HAR)  
... Important Functions to Remember

- Select appropriate message library
- Select appropriate Antennae option
- Activate all Flashing Beacons
- Deactivate all Flashing Beacons
- Create a clear and concise message broadcast
- Drag created message from library to Station Schedule
- Delete Emergency message broadcast
- Resend original Playlist to affected HAR Station
Maintenance
Maintenance

... Flashing Beacons

- Activation
  - Radio Controlled system
  - Pager system
  - Manual

- Gel Cell Batteries
  - Charger is Operational

- Illumination
  - Incandescent
  - LED
Maintenance

- Transmitter/Digital Recorder
  - Power (PL to Battery)
  - Antennae is Tuned
  - Hand Set
  - Forward Power (10W)
  - Weather Channel is Tuned

- Antennae
  - Pole
  - Wires

- Cabinets
  - Corrosion, Leaks, Moisture
Background

The National ITS Architecture provides a common framework for planning, defining, and integrating intelligent transportation systems. It is a mature product that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.) over a nine year period. The architecture defines:

- The functions (e.g., gather traffic information or request a route) that are required for ITS
- The physical entities or subsystems where these functions reside (e.g., the roadside or the vehicle).
- The information flows and data flows that connect these functions and physical subsystems together into an integrated system.

As you navigate through the National ITS Architecture, additional background information is often only a click away. A comprehensive glossary of architecture terms is on the menu and is also linked with the architecture content. If a green highlighted and underlined term marked with an asterisk (*) is unfamiliar to you, click on it to see its definition and links to other related terms. (Note: In browser versions earlier than 4.0, green highlighting of the glossary terms may not be supported. In this case, glossary terms will be highlighted with the same color as the other links.)

If you would prefer a summary document that you can print and read over coffee, a brief document is available that presents the key architecture concepts. A training course provides a more comprehensive look at the National ITS Architecture and the ways in which it can be applied.

Where to Start

## ITS Standards Application Areas

Standards application areas are deployment-oriented categories that focus on specific ITS services or systems. Each application area contains one or more interfaces in the National ITS Architecture.

### Application Area Matrix

An application area matrix identifies the specific ITS standards that are appropriate for each application area. For an explanation of this matrix and more information on how to use it, [click here](http://www.its-standards.net). For a HTML version [click here](http://www.its-standards.net).

### List of Application Areas

The table below lists the application areas by architecture interface. Click on an application area to view the roadmap and other deployment support products for that application area.

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<th>National ITS Architecture Interface Class</th>
<th>Standards Application Areas</th>
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| Center-to-Roadside – This category of application areas includes those standards that provide communication links between a transportation or traffic management center and roadside equipment that regulates the flow of traffic. | Data Collection and Monitoring  
Dynamic Message Signs  
Environmental Monitoring  
Ramp Metering  
Traffic Signals  
Vehicle Sensors  
Video Surveillance |
| Center-to-Center – This category of application areas includes those standards that facilitate communication between transportation management centers. This category includes communications necessary for transit use. | Data Archival  
Incident Management  
Rail Coordination  
Traffic Management  
Traveler Information |
| Center-to-Vehicle/Traveler – This category of application areas includes those standards that facilitate communication between transportation management centers and the driver of a vehicle or a traveler planning a trip. This category also includes communications necessary for coordination between transit management centers and their vehicles. | Mayday  
Transit Vehicle Communications  
Traveler Information |
| Roadside-to-Vehicle – This category of application areas includes those standards that facilitate wireless communication between roadside equipment and vehicles on the road. | Toll  
Traffic Signal Control |
| Roadside-to-Roadside – This application area category includes standards that facilitate communications between railroad, roadside equipment and highway roadside equipment. | Highway Rail Interface (HRI) |

[http://www.its-standards.net](http://www.its-standards.net)
ITS Standards Contacts

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Bill Jones is the Technical Director of the U.S. DOT Joint Program Office (JPO). Telephone: 202-366-2128 E-mail: william.s.jones@fhwa.dot.gov

Brian Cronin, of the Federal Transit Administration (FTA), coordinates ITS standards activities relating to transit. Telephone: 202-366-8841 E-mail: brian.cronin@fta.dot.gov

Jim Smailes, of the Federal Railroad Administration (FRA), coordinates ITS standards activities relating to the highway-rail intersections. Telephone: 202-493-6360 E-mail: james.smailes@fra.dot.gov
Questions?
Workshop

• Scenario 1
  – Hazmat spill
  – I-95 closed at Sample Rd. (both directions)
  – Duration 4 hours
**Scenario 2**

- Special event (Winterfest Boat Parade)
- Intercostals waterways
- Duration 5 hours

- **SE 17th Street Causeway** - Up: 6:30 Close: 8:30 Approximately
- **Las Olas Boulevard** - Up: 7:00 Close: 9:00 Approximately
- **Sunrise Boulevard** - Up: 7:30 Close: 9:30 Approximately
- **Oakland Park Boulevard** - Up: 8:00 Close: 10:00 Approximately
- **Commercial Boulevard** - Up: 8:30 Close: 11:00 Approximately
Workshop

• Scenario 3
  - Vehicle accident (Truck vs. Car)
  - I-595 center lane blocked east of the Florida Turnpike
  - Duration unknown
Field Visit