

TECHNICAL SUMMARY

Implementation of Highway Advisory Radio (HAR) System for Construction Zones in Baton Rouge

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INTRODUCTION

Each year a number of major interstate highway construction projects are initiated in the state of Louisiana. These projects often result in traffic congestion, lane closures, detours, lane shifts, etc. To increase the level of public information associated with roadway construction, the Louisiana Department of Transportation and Development (DOTD) has spread the news of impending construction projects through various means of communication.

Information related to the highway environment is typically relayed to drivers using traffic control devices such as road signs. Static signs are the preferred method of communication because of their low cost, durability, and familiarity to drivers. However, this method of communication is not effective during dynamic situations such as incident related congestion and inclement weather conditions.

A more sophisticated type of communication currently used by several state highway agencies is highway advisory radio (HAR). HAR uses low power radio transmitters to convey information to travelers on AM radio frequencies. Motorists can tune their radios to a specific frequency inside of the broadcast zone to receive highway specific information.

To address the issue of highway communication in Louisiana, DOTD initiated a study to evaluate the use of radio communication techniques for highways within the state. Specifically, DOTD has led the effort to use HAR in highway construction zones.

As part of this project, two networks of HAR transmitters were installed in the cities of Baton Rouge and Lake Charles.

OBJECTIVES

The objectives of this study were to:

- 1) Conduct a review of past and present HAR implementation projects and evaluate equipment requirements, licensing requirements, and operational strategies associated with these systems.
- 2) Define equipment needs, develop system specifications, and implement highway advisory radio systems in Baton Rouge and Lake Charles.
- 3) Develop in-house DOTD technical expertise in HAR system project implementation and operation.
- 4) Review existing and emerging ITS technologies to determine promising avenues for the future development of real-time traffic data collection and dissemination systems in Louisiana.

RESEARCH APPROACH

Highway Advisory Radio is not a new concept. The HAR technology has been used to disseminate information to drivers by numerous state and local highway agencies for more than 40 years. Recent published literature has highlighted HAR projects in the states of Texas, Minnesota, Florida, Virginia, Michigan, and New Jersey. A literature search was conducted with these and other states.

Some of the features that were included in this study and reported in detail in the full report were:

Highway Advisory providing information to drivers via low power AM radio signals

The commercial availability of many types of HAR systems

The availability of HAR systems in self contained mobile unit configuration

The sophistication and cost of the network system

compared to the pole mounted and mobile units

Controlled software programs for pre-recorded messages

HAR history

HAR communication issues such as roadway signing, message reliability, accuracy and message content

Personnel requirements

Performance surveys

Maintenance and operations and power source

Expanding the HAR system

DISCUSSION OF RESULTS

The results of the experimental phases of the Louisiana HAR have yielded a great deal of information that will be useful in the development of future systems in the state. Since the long term goal of the HAR system in Louisiana is to integrate with advanced traffic management systems (ITS), a portion of this study addressed ITS traffic data collection systems and technologies. The following were identified and described in detail in the final report:

1. Inductive LOOP detection
2. Video image processor detection
3. Ultrasonic detection
4. Microwave radar detection
5. Infrared detection
6. Passive acoustic detection
7. Magnetic detection

Among other things, the project revealed the need for multi-jurisdictional cooperation. It also developed equipment specifications, formalized operational practices, and increased levels of expertise in DOTD technical staff while allowing pass-through traffic in the project areas to gain valuable information about travel conditions through the project work zones. The project was also instrumental in revealing and addressing institutional and operational problems associated with HAR in Louisiana.

CONCLUSIONS

The HAR implementation project was very valuable to DOTD in many respects. It represented the department's first attempt to deploy a radio communications system dedicated solely to highway traveler information in the state of Louisiana. As such, a considerable amount of valuable information was gained.

RECOMMENDATIONS

Many of the questions associated with the purchase, installation, and operation of HAR in Louisiana were answered through the course of this project. Several critical operational questions should be addressed in starting up a new system. They are:

Who should have access to the HAR system?

Who should be responsible for collecting and processing of traffic/construction information for the system.

How should messages be prioritized and organized within the broadcast rotation?

Who should schedule and record messages for broadcast?

How long should messages play?

How long should a message or play list be?

What type of information should a message contain?

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