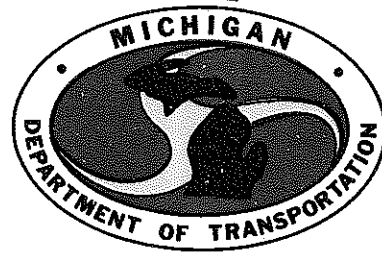


MICHIGAN DEPARTMENT OF TRANSPORTATION
M•DOT
AN EVALUATION OF A HIGHWAY ADVISORY
RADIO SYSTEM IN REST AREAS
HIGHWAY I 94, CALHOUN, BERRIEN
AND VAN BUREN COUNTIES



MATERIALS and TECHNOLOGY DIVISION

**MICHIGAN DEPARTMENT OF TRANSPORTATION
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AN EVALUATION OF A HIGHWAY ADVISORY
RADIO SYSTEM IN REST AREAS
HIGHWAY I 94, CALHOUN, BERRIEN
AND VAN BUREN COUNTIES**

Experimental Project Report by
Leo DeFrain, Janet Foran, and Fred Harwood
Michigan Department of Transportation
in Cooperation with the
Federal Highway Administration

Research Laboratory Section
Materials and Technology Division
Research Project 88 TI-1293
(Project Conducted as per Work Plan No. 106)
Research Report No. R-1309

Michigan Transportation Commission
Barton LaBelle, Chairman;
Charles Yob, Vice-Chairman;
William C. Marshall, Hannes Meyers, Jr.,
Irving Rubin, Richard White
Patrick Nowak, Director
Lansing, April 1991

ACTION PLAN

1. W. J. MacCreery, Chief Engineer and Deputy Director, Bureau of Highways
 - A. Transmit report to the FHWA in accordance with Experimental Work Plan.
2. Materials and Technology Division
 - A. Project completed, no further action necessary.
3. Engineering Operations Committee
 - A. No action necessary upon approval of this report.

Summary

Highway advisory radio systems were installed in three rest areas in southwestern Michigan along Eastbound I 94 during the 1988 construction season. The purpose of the project was to inform drivers of highway construction ahead and to reduce traveler's frustrations when experiencing construction delays along the route. This was done by using radio broadcast messages to inform motorists of construction sites ahead, thereby allowing the traveler to alter the route and/or schedule or at least be aware of what delays lay ahead and be able to make an estimate as to how many minutes of delay might exist. In order to evaluate the effectiveness of the radio system, motorists were interviewed by Michigan Department of Transportation staff at the rest areas. Motorists indicated that they had seen the signs installed to introduce the system, but only 11 percent used the service. They thought the radio system would be a beneficial service and that broadcasting tourist information would also be useful. Since few motorists had used the system in 1988, the experimental advisory radio system was not used in 1989.

Introduction

Some state departments of transportation have recognized the need to inform motorists of roadway construction and maintenance operations. Some informed drivers are able to avoid roadway bottlenecks, thus decreasing travel time, congestion and fuel consumption. Driver frustration is reduced and attitudes toward transportation departments are improved.

Motorist's advisory radio has been used in some states to inform drivers of existing roadway conditions. This information is conveyed to the motorist through the AM car radio. The utility of this is obvious, and the possible applications are endless. Roadside signs are already severely taxed in their ability to convey necessary bits of information. However, the motorist's auditory sense is underutilized. Motorist's advisory radio systems can take advantage of these facts and provide useful information to the driver.

In 1977, the Federal Communication Commission (FCC) authorized two types of motorist advisory radio systems. One system authorizes the transmission of voice information at 530 KHz and 1610 KHz on a standard AM radio. Broadcast distance is approximately five miles from the antenna (10 miles of total listening range). Only a local government can be licensed to operate these systems and only non-commercial information pertaining to traffic and road conditions, directions, local points of interest, etc., may be transmitted. This type of system can only be used when there is no conflict with other licensed radio broadcasts operating on adjacent radio channels.

Two such systems have been operating in the vicinity of the Mackinac Bridge since 1986. At these locations, several messages are stored in computer memory. From a remote location, one or more of the messages

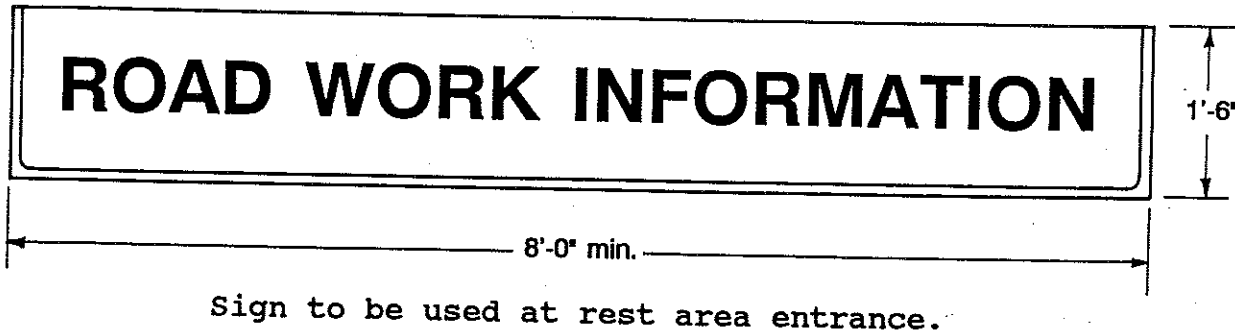
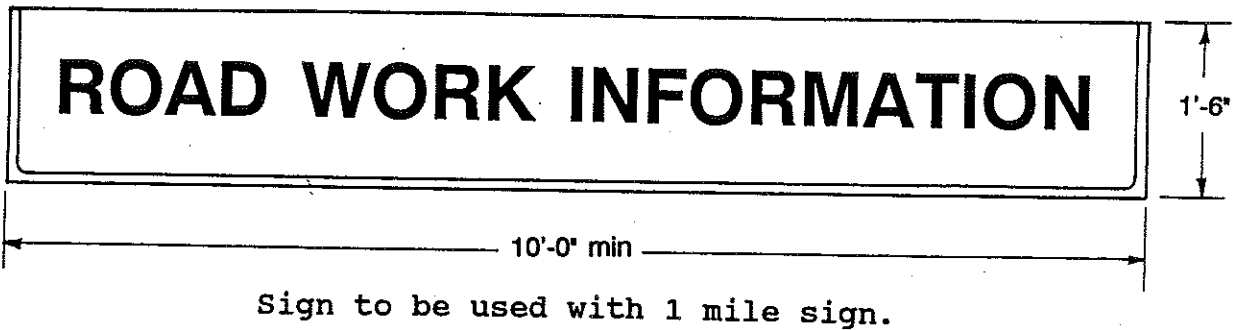


Figure 1. Signs located along I 94.

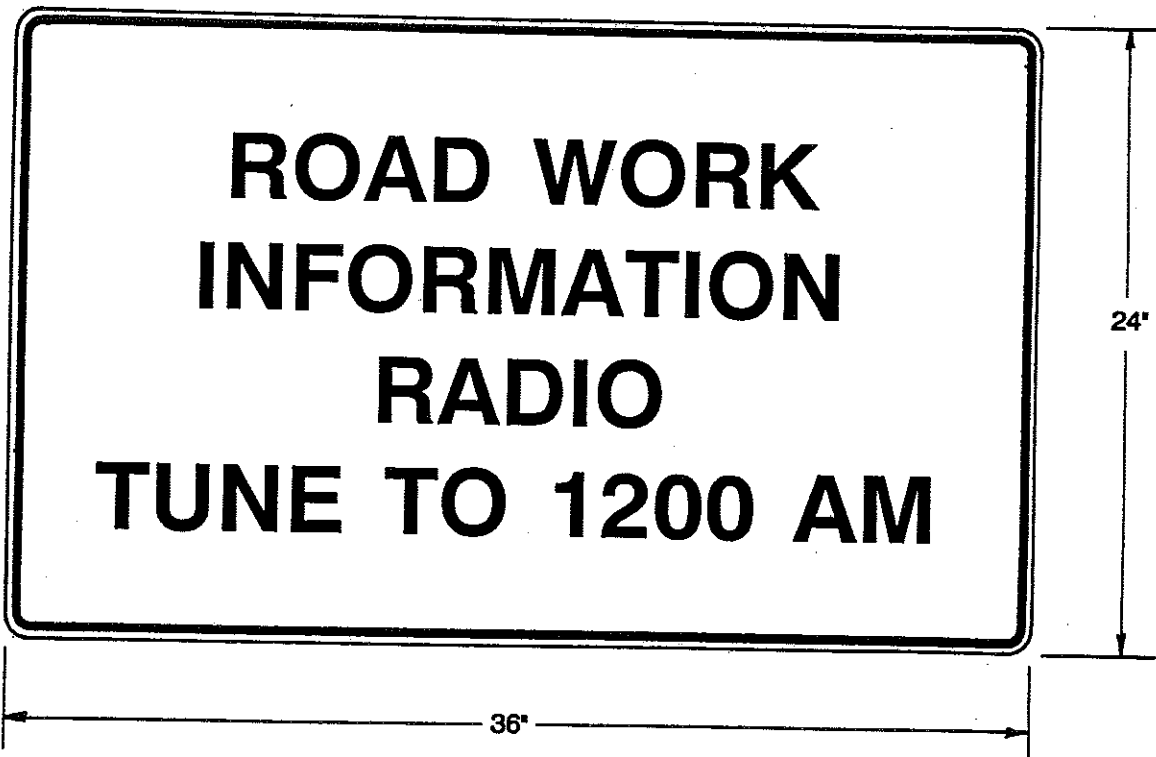


Figure 2. Signs located in rest area.

can be selected for broadcast. In 1988, two transmitters, one broadcasting at 530 KHz and one at 1610 KHz, were installed along I 75 at the Clio Rest Area and at the Erie Truck Weigh Station in Luna Pier. These systems are not a part of the experimental work discussed in this report but have a similar purpose, informing motorists of construction and maintenance work.

The second FCC authorized broadcast system is a low-power transmitter with a range of one-half mile. These systems are not licensed but voice information can be transmitted at any frequency in the AM radio band. It is only necessary to select a broadcast frequency which is one or two channels away from a local licensed station. MDOT has five of these systems. One is located at the Clare Travel Information and Rest Area and a second at the Okemos Rest Area. They operate at 1600 and 1550 KHz respectively and broadcast weather information. Broadcast information can only be received while in the rest area or on the highway in front of the site. The remaining three low-power transmitter sites are the subject of this report.

Installation of Highway Construction Advisory System

Three locations in southwestern Michigan on eastbound I 94 were selected for low-power transmitter locations during the 1988 construction season. They were the New Buffalo Travel Information Center, the Coloma Rest Area, and the Battle Creek Rest Area. MDOT contracted with Travelcast Radio Co. of Ann Arbor, Michigan, to install antennas and operate tape players at each of these locations. MDOT's Office of Communications provided the script and the necessary updates and Travelcast Radio Co. produced the tapes to be played at each site. Travelcast Radio Co. also maintained the transmitter system. This service had start-up costs of \$2900, and \$220 per month of operation for each transmitter location. A rate of \$30 per hour, plus \$120 for the recording studio service, was charged to produce the tapes for the system. The total contract cost for the three systems was \$15,800.

Signs were fabricated and installed by MDOT. Figure 1 shows the signs that were installed at the "Rest Area 1 mile" signs and the entrance signs at each transmitter location. Figure 2 shows the signs that were located at several locations in the rest areas and travel information center.

The three systems transmitted on a frequency of 1200 KHz AM. Motorists were instructed by the signs to tune to this frequency on their AM radio. A message recorded on a continuous cassette tape was transmitted to the motorist about highway construction ahead on I 94. An example of a message follows:

Script for New Buffalo Travel Information Center

This is one of 3 radio stations MDOT has set up in Rest Areas on I 94 to provide highway construction information. We hope that this message will minimize your inconvenience by informing you of possible delays. I 94 was built in the 1960's and has taken a lot of wear

and tear over the years. In 1988 we are repairing 73 of its 270 miles at a cost of over 300 million dollars. Please bear with us while the improvements progress.

Please listen carefully to the following list of construction zones. They will be identified by exit numbers. In some cases, you may be able to alter your route to avoid the slowdown, so you may want to jot them down. Here is the list:

Just after Exit 28 by Benton Harbor, traffic will be reduced to one lane for one mile due to bridge work.

From Exit 56 near Paw Paw to Exit 66 traffic will be one lane for 10 miles due to resurfacing of the highway.

At Exit 75 just before Kalamazoo, the Oakland bridge and its on and off ramps are being widened. The highway is reduced to one lane for one mile and the on off ramps are closed.

From Exit 110 at Marshall to Exit 115 the highway is being rebuilt. Traffic will be down to one lane for five miles.

Finally, before Jackson, highway resurfacing requires one lane traffic for 10 miles from Exit 128 to Exit 138.

Please drive carefully through the construction zones. Observe the 45 mile per hour speed limit. Speeding through these zones is very dangerous to the construction workers, as well as to you and other motorists. Help us make this a no injury construction zone.

This ends the broadcast. If you missed something, stay tuned. It will immediately repeat. This has been a service of the Michigan Department of Transportation. We hope you enjoy travelling in Michigan, but remember, please BUCKLE UP.

The message at each site was changed as construction changed along eastbound I 94. The three transmitter systems operated from April 18 to November 1, 1988.

Motorist Survey

Motorists were given personal interviews at each of the sites on different days. The number of people interviewed was 718. Appendix A gives a summary of the interview questions. The interviews were conducted on June 27 and 28 at the New Buffalo Travel Information Center, June 29 at the Coloma Rest Area, and June 30 at the Battle Creek Rest Area by MDOT staff members from Transportation Planning Services Division. Sixty-six percent of the motorists indicated that they did see the signs, but only 11 percent used the service. Three-quarters of the motorists thought the radio system would be a beneficial service and 64 percent thought tourist information would also be useful.

Discussion

Information was not obtained in the interviews to determine if the motorists frequently travelled the route. Obviously, they would not use the information if they were already aware of the construction projects on the route.

Construction information obtained by radio would be more useful if alternate travel routes were available and broadcast. This was not the

case for most of the subject construction sites. Only the construction in Jackson could have been avoided by using I 69, and then only if the motorists were travelling to areas north of Detroit or into Canada via Port Huron.

The cost-benefit of the highway advisory radio system was difficult to determine because traveler frustration due to delays and more difficult driving is hard to put in monetary figures. Projects like the one reported here are developed by the Department in an attempt to reduce traveler frustration and delays and improve the public image of the Department.

The highway advisory radio system was broadcasting construction information from April 18 to November 1, 1988. Since there was relatively low usage, the benefit produced by this experimental service was extremely limited. Even though public announcements were made in newspapers (see Appendix B), this idea was not easily accepted. Installation of transmitters at all rest areas in Michigan would help improve motorist awareness of construction delays and possible alternate routings, but the installation and operation costs would be very high.

1989 Construction Season

The experimental radio stations placed along I 94 were not repeated in 1989 along the same corridor for several reasons: 1) survey results did not indicate that people were using the radios, 2) the difficulties of producing quick, accurate information was a problem as the season progressed and, 3) the radios produced very weak signals which often were difficult to locate on the appropriate AM station.

During the 1989 construction season the transmitters were removed. The Department is now involved in improving a seasonal construction map which highlights the major construction projects in the state. This has been a successful method of sharing important construction news with Michigan drivers. It is updated and distributed three times a year. Therefore, it is recommended that this project not be pursued further.

APPENDIX A

Motorist Survey

A survey was performed to determine if motorists were aware of the highway advisory radios and if they used the system.

Four questions concerning the highway advisory radio system were asked motorists in June. These questions were added to ten other questions that dealt with overall use of the Travel Information Center and Rest Areas. The questions were as follows:

1. Did you see the radio signs?
 - a. Yes b. No c. Other
2. Did you use the service?
 - a. Yes b. No c. Other
3. Do you think it is a useful service?
 - a. Yes b. No c. Other
4. Would tourist information be helpful?
 - a. Yes b. No c. Other

The interviews were performed as the motorists were leaving the facilities. The dates of the interviews were June 27 and 28 at the New Buffalo Travel Information Center, June 29 at Coloma Rest Area, and June 30 at Battle Creek Rest Area. All interviews were performed from 9:00 a.m. to 10:00 p.m. Table 1 is a summary of the interview results.

TABLE 1

Question	1			2			3			4			Number Inter- viewed
	Yes	No	Other	A	B	C	A	B	C	A	B	C	
New Buffalo, Number	200	126	0	45	279	2	249	53	24	240	67	19	326
Coloma, Number	104	54	0	13	145	0	117	30	11	94	49	15	158
Battle Creek, Number	170	63	1	22	211	1	171	37	26	127	68	39	234
Totals, Number	474	243	1	80	635	3	537	120	61	461	184	73	718
Percent	66	34	0	11	88	1	75	17	8	64	26	10	

As can be seen from Table 1, 66 percent of the motorists that were interviewed saw the signs. Only 11 percent of the motorists used the service and 88 percent did not use the service. Three-quarters of the motorists thought the service would be useful and 64 percent thought tourist information would also be helpful on the radio system.

**APPENDIX B
NEWS RELEASE**

FOR IMMEDIATE RELEASE

5-3J

MAY 5, 1988

"From New Buffalo to Battle Creek, travelers along eastbound I-94 will be able to tune their car radios to a special broadcast which will provide highway construction information this summer, the Michigan Department of Transportation (MDOT) said today.

Three low-power radio transmitters will be in operation by Friday (May 6). Drivers can tune in the messages by dialing 1200 AM on their radios.

The radio information system is part of the transportation department's "Mobility '88" program designed to minimize inconvenience to motorists in highway construction areas.

Signing along I-94 will direct motorists to pull into MDOT's New Buffalo Welcome Center, or rest areas near Coloma and Battle Creek, for taped messages about road construction conditions ahead. Information will be changed as the projects progress.

The department has nearly a dozen road improvement projects along I-94, from bridge work near St. Joseph to major road reconstruction at Kalamazoo, Marshall, Jackson and Ann Arbor.

Travelcast Radio Co. of Ann Arbor installed the low-power AM radio transmitters and will assist MDOT with monitoring the quality of the tapes.

A second advisory radio system along I-75 in southeastern Michigan will go into operation Friday for travelers in the area."

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