

I-5, Vancouver Freeway

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# **Changeable Message Sign**

WA-RD 102.1

Final Report  
January 1987



**Washington State Department of Transportation**  
Planning, Research and Public Transportation Division

in cooperation with the  
United States Department of Transportation  
Federal Highway Administration

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**CHANGEABLE MESSAGE SIGN**

I-5, Vancouver Freeway

by

F. J. Blodgett, District 4 Traffic Engineer

**Final Report**

Experimental Feature WA75-02

Prepared for

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Department of Transportation  
and in cooperation with  
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## I-5, Vancouver Freeway

### Changeable Message Sign

#### Final Report

#### INTRODUCTION

Objective: In the mid 1970's preparations were being made to begin major reconstruction work on a 3.5 mile section of I-5 through Vancouver, Washington. This reconstruction of a major urban freeway offered a unique opportunity to evaluate the use of a Changeable Message Sign in informing, warning, and directing large volumes of traffic through a major construction area.

In March of 1975, a work plan establishing a Changeable Message Construction Sign Experimental Project was prepared and approved. Subsequently, a PS&E was prepared and advertised for bids. In March of 1965, American Sign and Indicator Corporation of Spokane, Washington, was declared low bidder and was awarded Contract 0176 for the supply and installation of a Changeable Message Sign and other hardware at a cost of \$47,632.14.

Location: It was determined that the sign would be located on the existing N.E. 63rd Street undercrossing. This location was selected after the following considerations.

- 1) Proximity to the proposed reconstruction: The N.E. 63rd Street structure is located approximately 0.54 miles north of any then proposed construction work, an adequate distance for motorists to read, comprehend, and act if necessary to any displayed messages.
- 2) Roadway geometrics: The N.E. 63rd Street undercrossing crossed I-5 at approximately right angles. I-5 southbound traffic at this point is proceeding toward the proposed construction on a negative 3.00% ± grade approaching a long radius curve to the left. The combined geometrics of all the elements involved provided for a site with excellent visibility to the motorist while providing adequate time and distance for the motorist to react.
- 3) Direction: The Vancouver Freeway has a history of conjection and has been particularly susceptible to backups and stoppages during the southbound morning rush hours. The situation had potential to become more severe as reconstruction of the freeway began. It was determined that a sign location visible to southbound traffic would be of the greatest value to the motoring public and provide the best opportunity to evaluate the effect of the Changeable Message sign project. A southbound orientated site would also supplement an existing advance warning system located near the southern limits of the proposed reconstruction project. (Existing sign reads, "PREPARE TO STOP", and is equipped with speed detectors). The construction area terminated at the Columbia River (Oregon State Line) effectively eliminating any sites suitably located for use by northbound traffic.

Maintenance: The Changeable Message sign has been in service since mid 1976, and has generally provided reliable service, however, it has not been entirely trouble free. Some of the problems we have experienced are cataloged below.

- 1) Telephone Circuits: The telephone lines connecting the remote keyboard to the computer unit and display are leased. Open circuits or lack of available lines sometimes delays or prevents activating the display board.
- 2) Schematics: The supplier failed to provide schematics for the computer unit, making repairs and/or adjustments to the unit difficult at best.
- 3) Repair information: Due to rapidly advancing state of the art electronics, the unit is now obsolete and is no longer manufactured. Requests for information and technical assistance often result in expensive and marginally useful information. Technicians dispatched, at considerable expense to the State, are sometimes unable to diagnose the problem. There have been times when the wrong technical expert was sent for the problem in question. State forces are currently providing most of the maintenance and repair work.
- 4) Display: We continue to experience an ongoing problem with erratic lighting of the display bulbs. The problem is not one of bulb failure. The bulbs that fail in one message may function as programmed in another, which indicates that the malfunctions are within the computer unit.
- 5) Loss of Memory: We have experienced sporadic losses of stored messages, some because of broken circuits and some for no apparent reason.

#### OBSERVATIONS

Purposes: A list of the major uses for the Changeable Message Sign with typical examples is tabulated below:

1. Construction Warning - "ROAD CONSTRUCTION NEXT 3 MILES"
2. Hazardous Condition - "STALLED CAR ON BRIDGE"
3. Accident Warning - "ACCIDENT ON BRIDGE"
4. Motorist Information - "EXPECT CONGESTION 3½ MILES"
5. Public Service - "DRIVE WITH CARE"
6. Other - "VOTE TODAY" (Election Day)  
- "HAPPY HOLIDAY" (Holiday Season)

A complete listing is found in Appendix A.

Response: There has been very little documented response from the monitoring public, however, some assumptions can be made concerning the value of the Changeable Message Sign.

- 1) Accidents: A redesigned roadway configuration and changing traffic volumes make it difficult to determine the sign's effect on accident frequencies, however, it is our opinion that the Changeable Message Sign had a positive impact on reducing accidents both during and after the construction stage.

- 2) Complaints: The lack of documented complaints would seem to indicate the sign was successful in informing motorists of construction and accident related delays and inconveniences.
- 3) Compliments: The Department has received some favorable press regarding the Changeable Message sign, especially concerning the display of public service messages and general greetings such as "BUCKLE UP", "VOTE TODAY", and "HAVE A NICE DAY".

Future: We anticipate this sign will continue to be a major factor in the Department's attempts to inform and direct motorists through the high traffic volume areas of Vancouver; however, the need for improvement and updating becomes apparent for the system to continue to operate as it does and to expand to its full potential.

- 1) Equipment Update: The existing equipment is becoming obsolete and will become increasingly difficult to maintain and repair. The sign and its support system is no longer being manufactured. Further updates of the system will undoubtedly require replacement of most, if not all, of the system.
- 2) Additional Installations: In view of the perceived positive contribution the sign has made to the Vancouver Freeway System and completion of other interconnecting freeways within the Vancouver area, expansion of the system becomes an obvious and desirable concept. Several new locations now lend themselves to the installation of Changeable Message Signs. These new sites would allow motorists to be routed on to alternate connecting roadways, bypassing closed or congested areas. District Four currently has two mobile Changeable Message Signs which have been used to alert or reroute motorists, supplementing the 63rd Street sign.

## CONCLUSIONS

The Changeable Message Sign project is generally viewed as a valuable part of the Vancouver Freeway signing system; however, tangible facts and figures on which concrete determinations of value can be made are difficult to identify. The following conclusions are generally based on opinions.

- 1) Value to Motorists: The capacity of the sign to warn motorists of hazards, delays or congestion is of an identifiable value. From a motorist's viewpoint, to be warned in advance of roadway problems, allowing one to make route changes or contingency plans is certainly a valuable aid.
- 2) Value to WSDOT: Better informing the motorist is always a goal of the Department. The Changeable Message Sign provided additional needed information, resulting in perceived reduction in both accidents and complaints during and after a major freeway reconstruction project.

## RECOMMENDATIONS

In view of the Changeable Message Sign's performance since its installation we would make the following recommendations.

- 1) All heavy volume urban freeways subject to frequent incidents should be considered as possible candidates for Changeable Message Systems.
- 2) Junctions of major freeways may lend themselves as sites for Changeable Message Sign installations (i.e. I-5/I-205).

## APPENDIX A

1 (VOTE TODAY)  
2 RIGHT LANE  
3 ACCIDENT AT 4TH PLAIN  
4 PREPARE TO STOP  
5 ACCIDENT AT MILL PLAIN  
6 ACCIDENT IN OREGON  
7 GOOD MORNING  
8 RIGHT LANES CLOSED  
9 ACCIDENT ON BRIDGE  
10 CLOSED AHEAD  
11 1 MILE AHEAD  
12 DRAWBRIDGE OPEN  
13 SURVEY CREW AHEAD  
14 (2 MILES)  
15 (DRIVE WITH CARE)  
16 HAVE A GOOD DAY  
17 (SURVEY CREW)  
18 CONGESTION AHEAD  
19 EXPECT DELAYS  
20 (CLOSED)  
21 LEFT LANE CLOSED  
22 MAIN ST.  
23 RIGHT LANE CLOSED  
24 (ONE MILE)  
25 RAMP CLOSED  
26 USE 39TH ST.  
27 STALLED CAR ON BRIDGE  
28 TRAFFIC CHANGE AHEAD  
29 <<<<USE LEFT LANE  
30 2 1/2 MILES  
31 USE RIGHT LANE>>>>  
32 EXPECT CONGESTION  
33 3 1/2 MILES  
40 WATER OVER ROADWAY  
41 ROAD CONSTRUCTION  
43 ACCIDENT AHEAD  
44 (REDUCE SPEED)  
45 CONSTRUCTION AHEAD  
51 (BRIDGE WORK)  
52 (3 MILES)  
101 CONGESTION  
112 (1 1/4 MILES)  
113 (1 1/2 MILES)  
114 BRIDGE CLOSED  
115 (ROAD WORK AHEAD)  
116 (LEFT LANE CLOSED)  
118 TESTING