A Report on the National Conference on Highway Communication for Service and Safety

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•THE 3-day National Conference on Highway Communication for Service and Safety sponsored by the American Association of State Highway Officials, the Automotive Safety Foundation, and the International Association of Chiefs of Police convened at the Continental Denver Hotel, Denver, Colorado, on August 21, 1967. Cooperating agencies were the Department of Transportation; the International Bridge, Tunnel and Turnpike Association, Inc.; the National Association of Counties; the National League of Cities; the National Aeronautics and Space Administration; and the Public Health Service.

The Steering Committee for the Conference was composed of A. E. Johnson, Executive Director, AASHO; D. Grant Mickle, Vice-President, ASF; and Quinn Tamm, Executive Director, IACP. John C. Kohl, Executive Secretary, Division of Engineering, National Research Council, National Academy of Sciences, was Chairman of the Conference.

A broad cross section of government, highway users, service organizations, manufacturers, and technical specialists was represented by the 126 attendees of the Conference. The official purpose of the Conference was stated as follows:

> To explore the need for—and characteristics of—an advanced communication system to provide for the safety, security, and service of the highway user. This Conference is to exchange information between official agencies, manufacturers, user groups, and other interested parties, to help official agencies determine general performance criteria for such a communication system.

The importance of the derivation of definitive results from the Conference was stressed by Federal Highway Administrator Lowell K. Bridwell in the opening session. Mr. Bridwell also expressed his opinion that the United States is presently on the threshold of the next major highway technological advance.

A definition of the problem and its magnitude, from the point of view of cognizant highway user agencies, police traffic services and highway official organizations, was undertaken. Emissaries from representative groups in each of these categories attempted to delineate the parameters and focus the issues of the situation.

Following this, detailed presentations pertaining to individual existing and proposed motorist assistance programs were outlined. In addition to such suggested innovations as expanded police patrol, the reporting of disabled vehicles by cooperative motorists, and increased helicopter and television surveillance, many somewhat unique, complete motorist assistance communications systems were detailed by their sponsors and advocates. Some of the more notable of these programs are reviewed in the following.

HELP (Highway Emergency Locating Program) provides for the outfitting of automobiles with 5-watt, 27 MHz Citizens Band transceivers. This would enable emergency calls for highway assistance to be placed by the average motorist. Highway authorities,

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garages, towing and ambulance services, in addition to 24-hour-a-day CB teams, would monitor motorist transmissions and arrange for the necessary assistance.

REACT (Radio Emergency Associated Citizen's Teams), the predecessor of HELP, consists of volunteer CB channel monitoring by organized round-the-clock CB teams.

CRW (Community Radio Watch) is designed to enlist the aid of all land mobile radio users to cooperate with local authorities by alerting police and other responsible agencies when crimes, accidents, and fires are detected.

A method of strategically located telephone call boxes, directly connected via land-line to central dispatch points, is finding both experimental and practical use in some parts of the country. Similarly, radio call boxes can afford emergency communications. Frequency shift keying tones (70 MHz) are coded to convey "police," "ambulance," or "wrecker" information via repeaters to a central dispatch point. Call boxes are in use that can also provide 150 MHz voice transmissions.

The DAIR (Driver Aid, Information and Routing) system utilizes 27 MHz CB frequencies. It requires an AIC (Aid and Information Center), MRS's (Message Relaying Stations), magnetic triggering traps placed in the road, roadside transmitters at properly spaced locations, and interconnecting cable laid between the MRS's and the AIC. The automobile driver, who must acquire a DAIR console for his vehicle, dials a selected service. Coded tones are conveyed from the vehicle via the mobile CB transmitter to the nearest MRS, thence via cable to the AIC for acknowledgment by a dispatcher. For information, the motorist dials "0" and is instructed by the dispatcher to change to another CB frequency for two-way communications.

RRA (Radio Road Alert) is a method of communicating with the motorist by the activation of prerecorded messages carried in the equipped vehicle. Coded messages from low-power, 27 MHz roadside transmitters trigger a memory storage in the vehicle and cause recorded announcements to be made through the automobile entertainment radio.

A system called "Multicom" utilizes induction radio techniques. Roadside cables installed within the highway right-of-way are used to establish localized communication zones at strategic points along highways. Verbal traffic information or routing instructions are received by the vehicle's broadcast receiver or by special low-frequency receivers.

Ancillary programs not necessarily requiring direct contact with the moving automobile were described. In this connection such conveniences as changeable visual signs and information services, as well as emergency necessities (fire, police, medical and mechanical assistance), were mentioned.

Conference participants deliberated on the technical and economic merits and disadvantages of many of these projects during open floor discussions and during later "workshop" sessions. Objections to the widespread use of CB frequencies were based on the certainty that frequency congestion and interference would follow. The propagation characteristics and troublesome "skip" associated with 27 MHz were discussed. It was pointed out that the utilization of roadside call boxes would require that the stranded driver abandon his vehicle, thus creating a hazard to other motorists, and become a pedestrian on the highway at great personal risk. Induction systems and low-frequency broadcasts would permit only one-way communication and would, hence, be of limited value to a motorist attempting to summon assistance. The complexities of operation and the expense associated with sophisticated programmed routing and magnetic triggering trap systems were cited as extreme disadvantages. Ideas with respect to the desired capabilities of a suitable communications system were advanced by highway user group and automotive fleet operator representatives.

During a "Technical Considerations" session, pertinent topics such as radio spectrum usage and radio systems, telephone and other wire systems, and the day-to-day operation and administration of possible highway communications systems were touched upon. Presentations in these areas were made by federal and state officials as well as commercial executives.

The presentation of formal Conference papers was brought to a close by two timely submittals stressing the "systems approach" to the ultimate design of a highway communications network. The applicability of the aerospace industries method of approaching similar complex situations was emphasized. Major research projects, presently in progress under the cognizance of the Bureau of Public Roads, were described.

At this juncture the Conference members were divided into representative groups. Four "Performance Criteria Workshops"—Highway Officials, Police Officials, Road Users, and Service Organizations—were set up. Each group attempted to reach agreement as to just what the requisites for a potential highway communications system should be.

The results of the efforts of each individual workshop were summarized and discussed. Unanimity of opinion was evident on one key item—the recommended formation of a permanent working group or committee to follow through on the myriad of vital issues brought forth during the Conference.

The end of the Highway Communication Conference was marked by the presentation of the Conference Report by E. M. Johnson, President of AASHO. Major conclusions and opinions agreed on during the Conference were set forth in the Report. Some of these significant items follow.

There has been no concerted demand by the public for a highway communications system; however, the motorist's need for travel information, assistance, and advance hazard warnings should be anticipated. Concrete steps should be taken before action is forced by public pressure.

Although communications systems presently used in the operation of highways are antiquated when compared to today's air travel and railroad communication systems, a direct parallel cannot be drawn. One major factor contributing to the difference in requirements between highway travel and other transportation media is that highway operations are subject to thousands of different political jurisdictions. Coordination is vital.

Simplicity, uniformity, reliability, minimum operating and maintenance cost, and public approval of a communications system are essential. The potential communication system should be compatible with the vehicle, the highway, the environment, jurisdictions involved, and the growth that will take place.

The communications system should provide for communication among proper authorities, services, and highway users without undue interference. The design of the system should preclude the dissemination of information to those not properly concerned. The ability to determine the exact services needed, and to reassure the caller, makes two-way voice communication desirable.

Should the radiation of RF energy be necessary in connection with a selected system, the necessity for availability of frequency allocations may become a serious problem.

Improved and more rapid medical service, increased police patrols, and concerted efforts to educate drivers (thus eliminating the need for many minor mechanical assistance needs) are desirable regardless of the ultimate highway communications system to be utilized.

The results of the Conference on Highway Communications for Service and Safety were very adequately described by the closing remarks of Mr. Johnson in the Conference Report.

> The exploration of the past three days has apparently given each person in attendance some awareness of problems and needs he had not previously had. It seems rather obvious that industry can provide the necessary hardware and technology when a determination has been made as to the detailed requirements of a communication system to meet the safety and service needs of the traveling public. The two cosponsoring public agencies intend to use the information gathered at this conference to draft performance and operational criteria for a highway communication system which it is hoped will be substantially uniform throughout the country. Undoubtedly the selection of the system type and its installation will be controlled by the availability of funds.