An Adequate Highway Safety Program

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INTRODUCTION

Highway safety is one of our most urgent and crucial problems. There are probably more words written about highway safety and death on our highways than on any other one subject. Safety has become one of the major considerations of highway engineering. The improvement of traffic safety and service is a major effort of the Bureau of Public Roads. The spot improvement program alone is expected to account for about 25 percent of the total annual expenditure of federal-aid funds available for highway construction on the federal-aid primary and secondary highway system. We are making it emphatically and entirely clear that safety improvements at high accident locations have had and will continue to have top priority for federal-aid highway funds.

Traffic fatalities in 1965 reached a total of 49,000. This total will probably be exceeded in 1966. Disabling injuries totaled 1,800,000. About the same number of people were hurt less seriously. The disabling injuries were about enough to fill every hospital bed in America. The measurable costs, such as property damage, medical and hospital costs, and wage losses, totaled about $8.5 billion.

It has been estimated that by 1975 we will have an increase of about 30.8 million vehicles to a total of 117 million. There will be 125 million drivers traveling something like 1.25 trillion vehicle miles.

The death rate in 1965 was 5.6 per 100 million vehicle miles. Assuming that efforts will be successful in reducing this rate to something around 4.8, we would kill about 60,000 people in 1975 in 15 to 16 million accidents. The injuries would increase about 25 percent or to a total of 2 million and the measurable costs would be in the neighborhood of $10 billion.

Since the introduction of the automobile in the United States, 1.5 million persons have lost their lives in traffic accidents—more than
the combat deaths suffered in all of America's wars. The completion of some 21,000 miles of interstate system has improved our fatality rate, a reduction to 2.8 deaths per 100 million vehicle miles compared to a previous rate of 9.7 on older roads in the same corridors. Much still remains to be done, and even more needs to be learned about the causes and prevention of highway accidents.

This sufficiently illustrated the problem and the need for action. Pressures for action have been building up and will continue to increase. Much has been done by many states, counties, and municipalities but there seems to be a reasonable doubt that any of them has done enough.

Many words have been spoken and written on corrective actions to be followed and explaining what is wrong with our present programs and activities. Wisconsin Senator Gaylord Nelson made some understandable and pointed remarks at the meeting of the National Safety Council's Committee on Winter Driving Hazards held at Stevens Point, Wis. on Feb. 3, 1966. These remarks were published in the Feb. 9, 1966 issue of the Congressional Record. He did categorize the highway safety problem as involving highway construction, driver training, traffic law enforcement, and automobile design and manufacture. These categories will be considered when an adequate program is discussed.

Ted Holmes, director, Office of Planning, U. S. Bureau of Public Roads, made the following statements in a recent talk:

"Another problem that should be viewed as critical but which seems to arouse little public concern is safety. In 1964 approximately 48,000 persons lost their lives in highway accidents, and the economic loss is estimated at a figure approximating our entire annual capital outlay for streets and highways. For many years, beginning after World War II, the fatality rate was pushed steadily downward, reaching a low of 5.2 deaths per 100 million vehicle miles in 1961 from the earlier level of over 12. These results were accomplished by constant and concerted action of many official and interested nonofficial groups carrying out a balanced program directed toward improving the performance of the vehicle, the driver, and the road. In the last three years, however, not only the number of accidents and fatalities, but their mileage rates, have been rising. In 1964, the fatality rate probably exceeded 5.7.

"To explore the question of highway safety is obviously a subject for a paper or a series of papers in itself. Despite safer highways—the interstate system thus far completed is credited with
saving at least 3,000 lives per year—and safer vehicles, the driv­
ing and walking public seems to display little interest in its own
safety. It can be but a commentary, and a sad one, on our times
that we accept as a cost of a form of transportation the loss of
nearly 50,000 lives a year. Probably it is because the likelihood
of a fatal accident seems so remote, one chance in some 18 million
miles or perhaps 50 lifetimes of an individual’s driving, that the
average driver does not perceive the safety problem as one of his
personal interest. Yet even a nation of nearly 200 million people
would not long tolerate any other condition that brought with it
a loss of 50,000 of its citizens in a single year. How long our
nation will tolerate such a loss, or whether as a people we would
accept the restraints to freedom in the use of the vehicle that must
be accepted to effect an appreciable reduction in accidents is a
social question, one that defies economics and logic just as does
highway transportation itself. Yet an awakening to the situation
may come, and come suddenly, if the rising accident rate trend is
not soon reversed.”

SOME CAUSES OF INCREASING FATALITIES

Before attempting to define an adequate program, it would be en­
lightening to review the many varied opinions as to what is causing
our increasing number of fatalities. This will also point out the
herculean task in reaching agreement and obtaining the maximum
effort towards accepting and working towards the accomplishment of
an adequate program.

Russell I. Brown authored an article entitled, Needed: $958
Engineering.” He cites an expenditure of $105 billion dollars on motor
vehicle transportation in 1964 and of this total, only $820 million
(equivalent to $8 per $1000) went for safety activities. He further
states that this expenditure is woefully inadequate for satisfactory
management of a $187 billion highway transportation system.

An article in the Feb. 14, 1966 issue of Barron’s “National Busi­
ness and Financial Weekly” entitled, Safety First? Politics and
Prejudice Are in the Driver’s Seat, contains some very interesting and
controversial statements. The article cites the much higher accident
rates in other countries of the world and states that “Viewed in per­
spective, the much maligned U. S. ‘safety establishment’ looks pretty
good.”
Ralph Nader, a 32-year-old Washington attorney, wrote a book, *Unsafe At Any Speed*. He made the claim that safe vehicle design would prevent 75 percent of the deaths and injuries occurring on the nation’s roads and streets.

**ACTIONS TAKEN TO REDUCE HIGHWAY CARNAGE**

In July 1965, the Bureau of Public Roads, compiled and issued *A National Program of Research and Development for Highway Transportation*. The program was the result of two years of study. It recognized the need for a national program to coordinate and concentrate our research and development efforts on the most urgent problems that face us in the highway field and the need for a systematic attack on the major problems facing highway transportation. Three high priority problems, namely: (1) highway safety, (2) urban transportation, and (3) reduction in costs of construction and maintenance emerged as being of greatest significance.

With regard to highway safety, the program stated:

“Major improvements in highway safety are mandatory, both from economic and social viewpoints. The 20-40 million accidents occurring annually at a cost of 10-15 billion dollars are a waste and such losses will become increasingly more intolerable. It is becoming increasingly apparent, however, that activities directed at ‘improving’ the drivers are insufficient. Major improvements must come through engineered changes which will aid the driver. The controlled-access highway is the best example of an engineered solution which has provided the greatest single contribution to safety ever devised. More fundamental developments, however, are needed if similar gains are to be made on existing streets. They must come through communication and control devices built into the highway and the vehicle.”

At time of last report, there had been some 50 research problem statements submitted in highway safety.

Some examples are:

Develop more meaningful accident frequency rates.
Study likelihood of accidents in terms of the proximity of fixed objects.
**Prevent** surface of bridge from icing prior to approach pavement.
Relate traffic control devices to driver behavior and traffic accidents.
Need for median crossovers on interstate system.
Determine more precisely by brand names the role of vehicle design, size, and weight that various vehicles play in traffic safety in regard to involvement and severity.

Problems created by dropping lanes at interchanges.

Develop warrants for lighting of interchanges.

Study the problem of prohibiting certain persons, vehicles, equipment, and animals from using the interstate system.

Effect of air pollution on driver characteristics and safety.

Many are familiar with or have heard of The Action Program as developed by the President's Committee for Traffic Safety. The action program is a guide to what needs doing—the national master plan. It does not tell how to do it.

Previously published sections of this master plan cover:

"Laws and ordinances, traffic accident records, education, engineering, motor vehicle administration, police traffic supervision, traffic courts, public information, organized citizen support, and research."

In an effort to step-up the activities of the states, congress, at its last session, passed the Baldwin Amendment. Congress came very close to approving a measure that would have suspended reimbursement of federal-aid funds to those states whose traffic safety programs were deemed inadequate. However, the measure as passed reads:

"After Dec. 31, 1967, each state should have a highway safety program, approved by the secretary, designed to reduce traffic accidents and deaths, injuries, and property damage resulting therefrom, on highways on the federal-aid system. Such highway safety program would be in accordance with uniform standards approved by the secretary (of commerce) and should include, but not be limited to, provisions for an effective records system, and measures calculated to improve driver performance, vehicle safety, highway design and maintenance, traffic control, and surveillance of traffic for detection and correction of high or potentially high accident locations."

The Subcommittee on Executive Reorganization, chaired by Senator Ribicoff of Connecticut, will continue the hearings on the Federal Role in Traffic Safety. Ralph Nader was the only witness at a lengthy hearing during the week of Feb. 7. His testimony before the subcommittee was published on page 3511 of the Feb. 22, 1966 issue of the "Congressional Record." An additional article by Nader relative to The Coming Struggle for Auto Safety was inserted in the Feb.
21, 1966 "Congressional Record" by Senator Nelson of Wisconsin. Hearings previously held by Senator Ribicoff's subcommittee have been published in booklet form, Part 1 and Part 2, by the U. S. Government Printing Office. Senate Bill 2162; to provide for research, design, development, and construction of fully operational passenger motor vehicles in prototype quantities embodying certain safety features, and Senate Bill 2231; to establish a National Highway Traffic Safety Center to promote research and development activities for highway traffic safety, to provide financial assistance to the states to accelerate highway traffic safety programs and for other purposes, are two bills being sponsored by Senator Ribicoff.

A series of regional interagency liaison conferences were held during 1964-5 for the purpose of discussing the adequacy and effectiveness of liaison between state agencies with a primary responsibility in highway safety. These seven regional meetings were sponsored by The American Association of Motor Vehicle Administrators, The American Association of State Highway Officials, The International Association of Chiefs of Police and were supported by The Institute of Traffic Engineers and The U. S. Bureau of Public Roads. At the outset of each conference, 90 minutes were devoted to brainstorming topical problems of mutual concern. There were 124 items developed as a result of these "brainstorming" sessions. A report of these conferences has now been published by the Bureau of Public Roads.

The most recent and the most significant national development was the introduction in congress of the President's proposed Traffic Safety Act of 1966. The three components of this program are (1) federal grants to the states for highway safety will be increased, (2) automobile safety performance will be improved, and (3) the federal government's highway safety research efforts will be expanded.

Title I authorizes the secretary to establish federal motor vehicle safety standards for motor vehicle equipment if after two years from the date of enactment of the act, he determines there is need therefor and that existing standards are inadequate or insufficient. The President in his message urged congress to act "speedily and favorably" on S. 2669, a bill establishing safety standards for motor vehicle tires shipped in interstate commerce. The present federal law providing for brake fluid and seat belt standards would be repealed but the standards continued in full effect. Appropriations totaling $45 million from the highway trust fund for fiscal years 1967 through 1972 would be authorized to carry out title I.
Title II authorizes the secretary to plan, construct, maintain and operate a traffic accident and injury research and testing facility. Up to $3 million would be authorized to be appropriated out of the highway trust fund for the planning of such a facility.

Title III authorizes the secretary to encourage and assist the states to establish highway safety programs, as now provided by legislation known as the Baldwin Amendment which would be repealed. A total of $420 million out of the highway trust fund would be authorized for this purpose over the six-year fiscal period ending June 30, 1972. Such funds, after deduction of administrative expenses, would be apportioned to the states, 75 percent on the basis of population and 25 percent as the secretary in his administrative discretion deems appropriate. An additional $160 million would be authorized for the same period to strengthen and expand the federal government's highway safety program.

The legislation for the national driver register service would be restated and expanded to cover denials, in addition to termination and withdrawals of an individual's license or privilege to operate a motor vehicle. The present procedure of reporting only on drunken driving and law violations resulting in death would be thus broadened.

Section 313, title 23 of the United States Code, directing the secretary (presently of commerce) to assist in carrying out the President's action program on highway safety would also be repealed. In his message the President said that The President's Committee for Traffic Safety would be "reorganized, strengthened and supported entirely by federal funds."

The President's message on transportation to the congress also urged the establishment of a Department of Transportation. This would bring together almost 100,000 employees and almost $6 billion of federal funds now devoted to transportation. The following agencies and functions would be consolidated in the Department of Transportation:

1. The Office of the Under Secretary of Commerce for Transportation, and its policy, program, emergency transportation and research staffs.
2. The Bureau of Public Roads and the federal-aid highway program it administers.
3. The Federal Aviation Agency.
4. The Coast Guard except in time of war when it operates as part of the Navy.
5. The Maritime Administration.
6. The safety functions of the Civil Aeronautics Board, the responsibility for investigating and determining the probable cause of aircraft accidents and its appellate functions related to safety.

7. The safety functions and car service functions of the Interstate Commerce Commission, principally the inspection and enforcement of safety regulations for railroads, motor carriers, and pipelines, and the distribution of rail car supply in times of shortage.

8. The Great Lakes Pilotage Administration, the St. Lawrence Seaway Development Corporation, the Alaska Railroad, and certain minor transportation-related activities of other agencies.

ADEQUATE HIGHWAY SAFETY PROGRAM

No attempt is made to compile a complete and adequate program for all the facets of highway safety. The intention is to dwell more specifically on highway engineering and only broadly touch on the other fields. For proper orientation and to assign responsibility to specific areas one must go back to the categorization of highway problems. First, let us broaden the previously mentioned categories slightly, namely, (1) highway design and construction (2) training and legislation (3) traffic operation and law enforcement, and (4) automobile design and manufacture.

Highway Design and Construction

Concepts of highway design and construction are changing and must continue to change until all the reasonable safety features are incorporated into our roadway cross section. We must not necessarily limit ourselves to:

1. Making uniform signing and marking a reality.
2. Ridding the roadway cross section of all obstructions that are destructive to out of control vehicles.
3. Flattening fill and cut slopes.
4. Moving piers and abutments of large structures as far away from edge of traveled way as is economically feasible.
5. Obtaining independent roadway design on maximum number of miles of dual lane pavement design.
6. Determining and using the safest sign and light standard.
7. Utilizing safer guard rail designs.
8. Paying particular attention to adequate signing, hazards at railroad crossings, condition of shoulders, location and size of
trees, and traffic operations during a stepped-up schedule of maintenance inspections.

9. Conducting sufficient study and research to develop guidelines on where to spend the safety dollar. Safety demonstration projects should start to give this answer. The safety dollar should be used where it shows the greatest accident and fatality rate reduction.

10. Accepting and utilizing the feedback from traffic operations and enforcement.

Training and Legislation

1. Driver training must be stepped-up.
2. Instructors must be included in our program.
3. Continued research on causes of driver lapse.
4. Passing of legislation requiring testing of drivers.
5. Passing of legislation denying privilege of using highways to proven dangerous and incompetent drivers.
6. Training of accident investigators.

Under No. 1 above, if all drivers were trained to accomplish the following simple test and to take corrective action, if necessary, before starting any trip, we would be much farther advanced than at present. Here are the questions:

a. Does everybody have his or her seat belt fastened snugly?
b. Is the car in safe driving condition—especially brakes, lights, steering and tires?
c. Is the driver prepared to leave at least one car length between his auto and the one ahead for every ten miles an hour of speed?
d. Has enough time been allowed to make the trip—without rushing?
e. For long trips, have frequent rest breaks been mapped out along the way?

All drivers should be trained to take the proper steps in case of an accident.

Operations and Enforcement

1. More alert and intelligent reporting of causes of accidents.
2. Usable feedback to design and construction.
3. Accepting and actually working for uniform signing and marking.
4. Continued research in such areas as wrong-way ramp entry, interchange and intersection lighting, edge marking, and finding out "what's wrong with drivers."

5. Improving our means of enforcing traffic laws and maximizing the penalty to flagrant violators.

6. Developing better means of pursuing and arresting violators on high volume urban freeways.

**Automobile Design and Manufacture**

The public must force the automobile manufacturers to step-up their research and to immediately incorporate all safety improvements into their currently manufactured vehicle. If it takes the development of compulsory national standards to place the safest vehicle that can be developed on the highway, then that is the route that must be taken. As a simple illustration of what hasn't been done—we haven't pushed the development of headlights which will give the drivers an adequate view of what is ahead and still not blind the other fellow.

Space will not permit discussion of a comprehensive safety program. Only a few of the items that may hurt both the pocketbook and one's vanity have been mentioned.

However, we must all admit that the price of safety is relatively small. The driver, the public authority and official, the automobile manufacturer, and the designer and builder of the highway must determine to exert an organized, intelligent and coordinated effort to give priority to the protection of life and limb.