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THE UNIVERSITY OF NORTH CAROLINA
HIGHWAY SAFETY
RESEARCH CENTER

Testimony to

Subcommittee on Surface Transportation
of the
Committee on Public Works and Transportation
U.S. House of Representatives

by

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HIGHWAY SAFETY RESEARCH AND IMPLEMENTATION FUNDING NEEDS

I would like to thank you for this opportunity to appear before you and to provide testimony concerning the reauthorization of the post-Interstate surface transportation programs. I am Deputy Director of the University of North Carolina Highway Safety Research Center, a center established in 1968 to evaluate North Carolina's state-based highway safety programs, to conduct research on issues of national importance, to train practitioners in the field of highway safety, and to provide public service to local communities in their safety programs. In this 20+ years, we have conducted projects for both FHWA and NHTSA, for various private funding agencies, and, through a cooperative relationship perhaps unique in the US, for various state agencies through funding provided by the North Carolina Governor's Highway Safety Program. I will attempt to provide information about safety research funding at the federal (403) level and about local highway safety program implementation and evaluation issues (i.e., 402 issues) in the State of North Carolina.

Thank you members of this subcommittee for your past support of safety and safety research. I will share with you some success stories that show that there is a clear link between safety research and real-world implementation of successful programs that reduce motor vehicle deaths and injuries. Then, I will share some of my thoughts about the types of additional research that's needed and why. I hope that this information will encourage you to continue, and even to increase, support for highway safety research in the face of pressures to cut the budget, to increase road maintenance, to increase traffic capacity enhancements, and to do all those other things that clearly need to be done and are often more "politically acceptable" than safety programs. There is little doubt in my mind that people would rather see money spent on repairing potholes and building new roads rather than on seat belt law enforcement research. However, the payoff from these possibly "unpopular" fixes are tremendous in terms of ultimate health care cost to society and emotional costs to families and individuals. Our mileage death rate is one of the lowest among industrialized nations. Yet at the current death rate, we will be killing approximately 80,000 people each year by the year 2020.

I emphasize that highway safety is a health concern. (I am changing the focus to health since it appears to me that most people believe themselves to be experts in safety -- it being mostly "common sense" -- but not in health issues.) As a health problem, motor vehicle injuries are the seventh leading cause of death. However, because the people who die from motor vehicle injuries are so young, the societal economic loss per motor vehicle death (based to a large extent on the number of years of productive life lost) is more than three times the economic loss from each cancer death and six times the economic loss from each death resulting from cardiovascular diseases. At the same time, research funding for <u>all</u> injuries (motor vehicle and other) is only approximately 16% of that for cancer research and 36% of that for cardiovascular research. Motor vehicle injuries are the leading cause of injury deaths (32% of the total), the second leading cause of hospitalization (22% of the total), and result in the largest share of the long term economic cost (31% of the total). The 1989 report to Congress concerning <u>Cost of Injury in the United States</u> indicates that motor vehicle injuries alone are costing our society approximately $49 billion per year in long-term economic cost.

I am not an expert in the appropriation of research dollars at the federal level, nor am I an expert in the priorities for US Department of Transportation research programs. I am sure they have provided you with that information. However, I do feel strongly that motor vehicle injury research may well provide more payoff per dollar spent than many of the other types of health-related research we are currently funding with little hesitation.

Let me now move to some specific information related to research findings and needs. I first submit that the research program must be an integrated program which includes research activities related to the driver (and pedestrian, bicyclist, motorcyclist, and other road users), to the roadway, to the vehicle, and finally to local, community-oriented programs within the States (primarily the 402 funded efforts). Second, I note that while we always hope to design treatments which are successful, safety research/evaluation which shows a lack of benefit is often as important as research showing a benefit. The safety field has been characterized for decades by programs and treatments which appear logical and beneficial, but which do not reduce crash injury when carefully evaluated. Each time a poor program is either eliminated or limited due to good evaluation, dollars are freed up for the implementation of successful programs.

With respect to the driver, in my opinion we have clearly conducted research which has resulted in decreases in death and injury at both the national and state level. For example, we have identified the effects of various occupant restraint systems, have evaluated methods through which usage of these systems can be increased (both educational and legal), and have implemented these programs to the extent that we have now increased seat belt usage from a very low figure of approximately 8-12 percent before 1980 up to the current figure of somewhere between 45 and 60 percent. Unfortunately, our research also shows that the 40-50 percent who continue to not use existing occupant restraint systems are involved in more than their share of crashes. Thus, there is a clear research need to develop means for targeting the non-users, finding out why they don't use the belts and finding out what programs might work. (I have recently served on a Transportation Research Board committee in which the occupant restraint research needs have been more fully examined and defined. I refer you to TRB Special Report 224, Safety Belts, Airbags, and Child Restraints -- Research to Address Emerging Policy Questions for additional needs.)

In other driver-related areas, while we know that suspending or revoking the license of a "poor" driver will significantly reduce their subsequent crash rates, this is not a sanction that can be applied to a large number of drivers. Indeed, we have identified few educational or short term (non-sanction) programs which appear to have significant benefit. For example, there is a clear need to identify additional programs which would reduce the elevated crash risks of both the young male driver and the elderly drivers (who will become an increasing part of our driver and pedestrian populations). In terms of alcohol use and motor vehicle injury, while there has been a decrease over the past few years in the percentage of alcohol-related deaths on our highways, alcohol continues to play a very significant role in fatal and injury crashes. Our society drinks (and now to worsen the situation, some part of our society

drinks and takes drugs). We are bombarded with TV and radio advertisements which indicate that drinking is not only an acceptable part of life, but is a desirable, sexy, and almost necessary part of life. The amount of money that is spent on sending these messages to us far, far exceeds the amount of money we spend on programs to find ways to keep our society from drinking and then driving cars. Clearly, significant research is needed here to determine what can continue to reduce the incidence of drinking (and now drug-related) driving.

With respect to basic driver education programs, we have had very little success in documenting a benefit of the driver education program as it is now taught in the U.S. Perhaps this is partly because of the limited amount of hours that are spent in these programs (only six hours behind the wheel for most students) and partly because an effect for such a limited program is more difficult to quantity in our society where students have grown up with cars (and thus received some "driver training) all of their lives. However, given the high risk of teenage drivers, it may be time to look at programs which gradually introduce them into the licensed driver population by requiring that they accumulate a large amount of parentally-monitored driving experience before full licensure, or by permitting only daytime driving for first-year drivers, or, indeed, by refusing to license 16 year-olds. While these are decisions that will be made in a legislative arena, they must be based on research. These programs have not yet been tried and thus the research and evaluation has not yet been completed.

Finally, there is the issue of research that has not been done through the past 20 years in the basic areas of driver behavior -- why do drivers behave and drive as they do? My understanding is that NHTSA is beginning in a new emphasis area with respect to driver behavior including the development of a driver simulator, a move that is needed. However, I note that this possibly very expensive effort needs to be well-managed in order that it not cripple other crash-related research programs.

With respect to the roadway, FHWA's research programs related to roadside hardware, bridge rail and guardrail design, roadway geometrics, and other aspects of the roadway system have resulted in information which can be put to use daily by roadway designers and traffic engineers in their work. However, as documented in reports such as Highway Safety: At the Crossroads, we have not developed a "science-based" system for the engineer such that he or she has the safety-related knowledge to compare alternative designs in terms of potential future safety benefits and costs. Part of the problem lies in the lack of sound research information on certain roadway features or designs. Even though we have been conducting roadway research for years, there are still a number of treatments and roadway design components for which we have no defined level of safety benefit. These include such basic things as sight distance at intersections, the benefits of lower level (less expensive) guardrails or safety hardware on low volume roads, the effect of increased use of heavy and larger trucks on our highway, the effects of various types of signalization at our intersections, and others. These problems have been noted by others in their work and clearly need emphasis and increases in research funding.

But part of the problem also lies with the education engineers receive, the transfer of safety knowledge to the design manuals and warrants used by these engineers, and the priority of safety in the existing State and Federal highway bureaucracy. While I am certainly not criticizing FHWA for the work they've done from a safety research point of view, I agree with the aforementioned report that it is the case that safety has not been given a high enough priority within the engineering community. (I say this as a traffic engineer myself.) There has been little safety education provided to engineers in our roadway engineering curriculums, nor has there been the transfer of research-based knowledge to these engineers in their on-going work. Thus, there are not only research funding needs, but also needed study of how safety could receive a higher priority in the decisions made at both the federal and state level. There is also documented evidence in the same report that some states have not done an acceptable job of spending even those limited highway safety funds appropriated for spot-improvement programs, nor have they evaluated treatments implemented such that future knowledge can be developed. As I expect has been noted by previous speakers, North Carolina has a long-established program of hazard correction in our State. In addition, our DOT is moving even further forward by establishing a highway safety team within the Division of Highways whose job will be to ensure that the various safety-related programs being conducted within the DOT are coordinated and that safety does receive the needed priority in both design and rehabilitation efforts. Similar programs need to be implemented (indeed, required) in other states.

With respect to the vehicle, NHTSA and automobile manufacturers continue to carry out programs aimed at making the vehicle safer, and these efforts have significantly increased the crashworthiness of these vehicles. However, our progress to date may well be changed by continued increases in oil prices and by the demands of our environment which will require more fuel-efficient (smaller, lighter) vehicles. Such changes will result in safety tradeoffs, tradeoffs which need to be studied carefully before decisions are made.

I would also note the need for more coordinated research between those designing vehicles (or vehicle regulations) and those roadway researchers who are responsible for designing roadside hardware (e.g., guardrails, breakaway sign posts, utility pole treatments, etc.). We change vehicle designs each year, but the safety hardware beside our roadways stays in place for up to twenty or more years. Since the hardware design is based largely on the results of crash tests involving vehicles in the fleet at the time of design, subsequent (sometimes minor) changes in such parameters as the stiffness of the vehicle fronts or doors, the height of the frame, or the seating height of the driver can cause well-designed hardware to quickly lose a significant part of its effect due to changes in the vehicle fleet.

A final vehicle-related issue that I bring to your attention is the need to build safety research into the new work now being done in the Intelligent Vehicle/Highway System arena. My understanding is that this will be an emphasis area for FHWA, NHTSA and private enterprise over at least the next few years. I note that, in addition to US/foreign economic factors, the primary rationale for this work is to increase capacity, i.e., to move more vehicles on our limited roadway network. This effort clearly has immediate safety implications (such as possible driver distraction from "heads-up" displays),

but also leads to the possibility of future enhancements in overall vehicle safety. There is a safety subgroup involved with the Automated Driver Information Systems workgroup. What is needed is to keep safety as a priority issue in this work, to identify both short-term and long-term research needs, and to fund them adequately.

With respect to local programs, I submit that the majority of safety programs that are implemented in local communities in North Carolina and a significant number of safety programs implemented on a statewide basis have been a direct or indirect result of 402 funding. As described in earlier testimony by Mr. Paul Jones, Governor's Highway Safety Representative, 402 funding has allowed our state to design trial programs based on our best knowledge, to implement these programs, and then to evaluate these programs to determine if they are having the expected benefit. It has also allowed us to evaluate other programs that the state already had implemented and make recommendations concerning their future. While I cannot speak for the other states, I feel that the 402 program has been a success in North Carolina. Let me provide one example of this success.

In the early '80's, our observational and crash report data indicated that infants and young children were being protected by restraint systems only approximately 3 to 8 percent of the time. Using 402 money, we then began an effort to determined the size and nature of the problem in order to design a series of possible treatments. We tried educational programs at physicians offices alone. We tried public education programs and the establishment of community restraint-loaner programs. These were not enough, but because of health-related interest that had been generated in local communities (mainly by 402 activities), our state legislators were convinced to pass a child safety seat law. Our usage level in North Carolina is now over 85% for children less than 5 years of age. It is estimated that over 300 children have escaped serious injury as a result of this safety seat use. This would not have occurred without these 402 funds. As an offshoot of this activity, during the early years of the program, 402 dollars were used to help establish programs in which local community groups across the state were provided with training and matching safety seats which were to be loaned out to people who could not otherwise afford to buy one or who would not purchase their own restraint for other reasons. At the peak, staff at the Highway Safety Research Center were working with and monitoring the progress of 134 of these programs. However, the ultimate success of this project is that although funding for these programs was stopped in October of 1986, our latest inventory shows that almost 100 of these programs continuing to operate in the communities. This represents a tremendous number of hours of volunteer time and a large number of children that have been protected, all as a result of 402 funds.

This is only one success story. There have been others. I fully believe that 402, if properly managed and properly implemented, can be a very successful compliment to the 403 research and implementation efforts at the national level. I believe that our success has been the result of a number of factors, with two of the primary ones being an early strong link between the GHSP program and the research and evaluation expertise at HSRC, and good GHSP administrators and personnel. While my opinion may not be shared by all, I believe that to be successful, the 402 programs have to be coupled with

evaluation and research expertise which can help define possible treatments based on research knowledge and can evaluate trial programs to determine which are beneficial and which should be dropped or modified. I would urge continued funding of this effort with the guidelines that it be a program and evaluation effort rather than just a series of projects designed by well-meaning administrators or local "safety experts" who may or may not be knowledgeable concerning what works and what doesn't. We have been very fortunate in North Carolina in that the administrators have either come into the program with knowledge of the highway safety area or have been willing to gain such knowledge quickly in their tenure. I think this will continue to be the case in our state and would hope it would be the case in other states.

In summary, I have mentioned a number of areas which I feel deserve research and implementation efforts and funds. I began this talk by saying that there are also tremendous needs for roadway maintenance and construction activities. I am certainly not trying to make this a battle between construction and maintenance needs and safety needs. I hope and trust that there will be enough money for all of these needs, as all are essential to an integrated program. However, given my years of experience in safety research and in safety program implementation, I do feel that in times of short budgets, increased inflation, and increasing pressure from the public to make their "driving lives" better immediately, there is the tendency to meet immediate demands rather than the more nebulous long-term costs of future health care and emotional trauma. However, these long-term costs are the ones that will be most important to not only our current generation but also to the generation that my child and yours belongs to. I realize that I may be "preaching to the choir" in my remarks to you, but I hope that some of this information will help you carry this message to you fellow committee members and to the rest of Congress in the STAA budget deliberations.

Thank you very much for your attention.

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