

# SECTION 5

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Experimental Safety Vehicle Programs Office,  
National Highway Traffic Safety Administration,  
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for Research and Development, National  
Highway Traffic Safety Administration,  
United States Department of Transportation and  
Chairman of the Second International Technical  
Conference on Experimental Safety Vehicles*

# SECTION 5

## PART 1 SUMMATION AND CONCLUDING REMARKS

**Mr. Albert J. Slechter, Jr.**

*Assistant Director,*

*Office of Experimental Safety Vehicle Programs,  
National Highway Traffic Safety Administration,  
United States Department of Transportation*

Good morning again to you all. Yesterday afternoon we participated in two technical seminars; one on crashworthiness or passive safety, and the second on accident avoidance or active safety. We would like this morning to summarize these sessions and, as contributors from the pilot ESV country, give further perspective, if we can, to the areas of concern to the technical participants. We will have time for comments or questions from the delegation after the summary is completed.

We recognize that in this four-day period a tremendous amount of technical information has been presented, and there has been little time to digest it and to react from one delegation to the other. That, of course, is going to now be the job of all of us when we leave Stuttgart. Many opinions on specifications and priorities have been outlined in the seminars and in the technology outlines presented earlier this week. We need to consider these opinions carefully in order to assure that the best inputs from all experts throughout the world are obtained. Each of the countries represented here have road situations and safety problems that have a high degree of commonality. Yet in some cases, specific differences do exist. On a personal basis I became more familiar last weekend with the German road environment in a drive on the Autobahn to Ulm, then on down to Garmisch, west to Lindale, then on back to Stuttgart. The importance stressed in Germany on accident avoidance particularly vehicle handling and braking, was particularly noted. It is sufficient to say that the sense of priority on accident avoidance in Europe and Japan is well understood by the United States delegation. Of course, the higher priority of crashworthiness emphasized by the United States in car designs recognizes that

so long as normal people drive, and until the driving process is totally automated, many crashes will inevitably occur. I won't expand further on this thought since I believe it is well documented by now. I will now briefly highlight some of the more critical problems and concerns that have been brought forth during the conference. The order is not significant.

First, I believe dummy fidelity, the ability to obtain repeatable results in tests with anthropomorphic dummies, has been clearly indicated as a concern by all the delegations. Our Safety Systems Laboratory in the National Highway Traffic Safety Administration is very actively pursuing the standardization of the dummy. For the United States ESV program we have arbitrarily, although with the best information we now have available, opted to use a modified Alderson 50th percentile dummy, at least for our prototype tests. As improvements in dummy design become available, we will, of course, take advantage of them.

Second, the General Motors delegation pointed out the extreme difference between designing for just 50th percentile dummy performance vs. designing for the full range of dummies, from the 5th percentile female to the 95th percentile male. General Motors also pointed out that designing a system which uses belts, whether active or passive, and of course ESV is a passive restraint car; but designing for belts is a much different problem than designing for airbag restraints.

Third, the French delegation continues to indicate aggressiveness as a serious problem in the front end design of an ESV, and we agree with them. We believe this is probably one of the most significant trade-off situations that we face, the trading off of aggressiveness against crashworthiness. In order to make this trade-off properly, as the ESV program matures, we must have better data on what happens on the road -- what kinds of accidents occur and the speeds at which accidents occur. That brings up the "mixed traffic" situation, which has also been indicated as a problem; we may be over-emphasizing the fixed barrier collisions in performance specifications at the expense of the mixed traffic situation of car-to-car, car-to-pedestrian, and car-to-cycle crashes.

One common thought must be shared by us all as a result of this meeting. That is all of us must recognize the need to maintain flexibility in our thinking as we explore feasible, practical designs of subsystems and vehicles. For example, the United States ESV specification from the beginning stressed safety in barrier crashes up to 50 mph, together with other difficult specification challenges. We are not unalterably fixed to these requirements. Many, in fact, most appear to be feasible, but we believe all ramifications should be explored regarding these specifications. Without setting such a tough goal at the outset, we couldn't hope to focus the automotive engineering experts of the world on a very substantial increase in safety performance. The cost effectiveness of such specifications has not yet been determined, but is a critical analysis that must be performed by all countries, and exchanged between countries when available. Of course, as everyone who has ever tried to perform such analysis should know, data from on road accidents is critical to the analysis. It has been my experience that one never finishes such an analysis to complete satisfaction, because data are never totally complete. Nevertheless, we are increasing our research efforts in the United States to obtain the best data that we can on the speed of accidents, type of accidents, and their consequences. We expect that reasonable data will begin to be available from these programs in the 1973-74 period. It will then be coupled with the safety performance feasibility information from each of the international ESV projects. This coupling will then form the basis for first recommendations by the ESV research group of the National Highway Traffic Safety Administration, to the rulemaking bodies of the National Highway Traffic Safety Administration. Substantial lead time is anticipated to allow manufacturers time to tool up to ESV levels of performance. It is my intent here to emphasize that the ESV program is an evolutionary, exploratory program; it is not bound rigidly to a final specification at this time, but instead seeks to use the initial specification as a basis for:

1. Exploring the feasible upper limits of safety performance that can be designed in the vehicles of various weight classes,
2. Evaluating the cost and effectiveness of solutions at these specified levels,
3. Optimizing specifications for cost effectiveness, and
4. Final demonstration of feasibility through systems tests.

Some of the ESV projects are now involved in the first element; demonstration of feasibility and/or identifi-

cation of more obvious trade-offs. By our next meeting, this step for the larger class vehicle should be well along.

I would like to touch just briefly on what we see as a possible optimization, not in detail, just an indication of some of the thinking that is going on in the United States program. I'll speak most specifically to the crashworthiness specifications.

1. We are seeing, in the United States' ESV programs, that the "no damage" requirement at 10 mph in front and rear is causing a severe weight penalty in some designs, and this is particularly true in the rear end designs. We feel possibly that a relaxation will take place ultimately in that requirement.
2. Dr. Appel, yesterday, spoke of the 50 mph moving barrier and the 75 mph car-to-car requirement in rear collisions; and we agree that even though we are not at all sure of the details of the data presented and the accuracy of that data, the trend should be to lower this requirement. Again, a weight reduction can be obtained.
3. I mentioned earlier the pole impact requirement at 50 mph. We feel that here again we should take a very careful look at the 50 mph pole requirement, with a view toward a possible reduction in this requirement.
4. We recognize that we have been binding our contractors very rigidly to a three-inch intrusion specification for all crash modes. It is now rather clear to us that intrusion, which is not safety related, can take place in the passenger compartment. We believe, therefore, that in optimization, we can allow increased intrusion just so long as that increase is controlled in the structure. Again, obvious weight savings can be achieved.

You might obviously recognize that all of these comments bear heavily on the weight problem. Perhaps, we have appeared a bit mysterious in announcing weight figures specifically for the United States prototype cars. I hope it is understood that the Fairchild and AMF competition situation precludes our saying too much in this area until the cars are delivered and evaluated. We admit both prototypes are over the weight specification at this time. However, some of the items I have just mentioned as possible optimization candidates can work towards getting our cars into a weight class that is practical for the United States full-size car market. We believe, similarly, that on a percentage basis the weight of a smaller car can be maintained at a practical level.

Thank you.

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## PART 2 CONCLUDING REMARKS

Mr. Douglas W. Toms  
*Administrator, National Highway  
Traffic Safety Administration,*  
United States Department of Transportation

I would like to compliment the presenters. I feel that in every instance the people who participated in this conference did an outstanding job. Obviously, we now have a worldwide effort on experimental safety vehicles. Practically every auto producing nation and every automotive manufacturer is working on some aspect of the ESV project. In the United States we look favorably on this point and feel that this worldwide participation assists us, and we are convinced that it will benefit all the peoples of the world.

We recognize that at this conference there was a clear expression of a difference of opinion and we feel that this is a healthy situation. Make no mistake, at no time do the people involved in the United States feel that we have all of the answers or that the paths that we are following are the best ones. I would like to emphasize that the specifications for our experimental safety vehicle project were, at that point in time, our best judgment. We clearly expected that as more research took place and further experience was gained that changes would be necessary. In this regard, I would like to solicit the comments of all the auto producing nations and the comments of every manufacturer on how they feel our ESV specifications could be improved. These are not sacred, we're open-minded about them, and we must move towards the best possible set of requirements.

We should emphasize that the reason we are developing ESV, is to save lives and reduce injuries. We have repeatedly said that our priorities in the National Highway Traffic Safety Administration are first, to save lives, second, to reduce injuries, and then to concern ourselves with property damage. When we talk about certain kinds of restraints, or crashworthiness goals we do consider all three elements, but if there are trade-offs

to be made then the savings of lives must receive the highest priority.

We are much encouraged by the worldwide auto industry's commitment of dollars and resources to the ESV project. This conference clearly shows that a massive amount of money and large resources have been poured into the ESV program. We are very pleased to see this and hope that we can all work together to truly come up with requirements, worldwide, that will save lives — not just on the roads of America but on the roads of the world.

A comment needs to be made about the amount of information that was presented at this conference. Mr. Edwards said that we would have a report to you in 90 days. As you review and think through the information that was presented during the conference a great deal of new information will come to light. During the first few days as I listened to the presentations, it was clear to me that some old ideas were rejected; some ideas reflected a difference of opinion, and new solutions had been found to many continual problems. This conference has been good, in pointing out that progress has really and truly been made.

I would now like to comment briefly on the systems approach to the rulemaking requirements of the United States. A crashworthiness performance requirement, a handling performance requirement and perhaps a few other performance requirements would be issued in lieu of the specific requirements called out today. In terms of timing, it would be my judgment that we would be moving towards such a rulemaking approach within the next year or two with an implementation date in the late 70's.

It is essential that both industry and government work together. I do not mean this in terms of the automobile industry and the United States Government. I mean it in terms of all governments working together and all segments of the industry working together. This begs the question of anti-trust. Certainly we want to be sure that no situation exists where portions of the auto industry may collaborate to withhold products or information that would benefit the public. One of the ways that we assure that such collaboration does not

occur, is by inserting the government into the proceedings. Much of the conversation that has gone on at this conference and many of the meetings that have taken place are in direct violation of our anti-trust laws if it were not for the presence of the government representatives. So this is a device where the governments work together so that they are able to provide for the exchange of information without violating the laws.

The concept of aggressivity came up repeatedly and I would like from a National Highway Traffic Safety Administration policy viewpoint to make a comment. From what I have heard at this conference and from the information that has been presented to date, it appears clear to me that an aggressivity index is in order. Whether or not we will make the large car, through a softer structure, accommodate the small car remains to be seen. The evidence appears to partially support this approach. Clearly the small-large car relationship is a tough problem, and we must find solutions. The laws of physics are such that if we do not have some sort of an aggressivity index the small cars are going to get the short end of the deal in every crash. So some kind of solution must be found and so far it appears that an aggressivity index is the best solution. Possibly in the next year or so other solutions will be found.

A lot has been said about cost benefit ratios — the relationship of performance to cost. In my judgment, neither industry nor government has been particularly skilled in this area, however, I must insert a disclaimer. Certainly every manufacturer knows exactly what it costs him to produce a car, but trying to translate these costs to benefit to the public at large is difficult. I don't believe that any manufacturer would be willing to agree with his competitor as to how his car benefits the public in relationship to his competitor's car. I'm sure that every manufacturer feels that his car is a better value than his competitor. Therefore, the cost benefit relationship is difficult, and this is where the government can help. We are going to have to be more open about costs and perhaps it will be the role of the government to determine what the benefits are and to priority-rate these benefits. Then maybe we can really begin to talk openly about cost benefit relationships.

Last year, as Secretary Volpe commented, we experienced a reduction of 1,100 lives lost on our highways — a substantial reduction in our death rate per 100 million miles traveled. This year it does not look as good. We are embarking on a massive campaign in November and December to try to bring down the number of lives lost. One of the complicating factors is

that each year there are more cars sold and therefore more miles driven. This year we are experiencing an excellent reduction in our death rate, but the numbers of deaths are not coming down. Consequently the cost is still going up. The projections indicate that in direct costs we will exceed 18 billion in losses this year. Including direct and indirect we will experience losses in excess of 40 billion dollars. I'm sure it is the judgment of the United States Congress and United States Government that these losses are too large. I want to emphasize that the reason that we are here and the reason that the National Highway Traffic Safety Administration exists is to reduce these losses. That commitment is total and absolute.

This has been an excellent conference, and I invite each of you, one and all, government and industry to come to Washington for TRANSPO 72. The third ESV conference will be held in Washington in conjunction with TRANSPO 72. The dates of the conference are May 30, 31 and June 1, 1972.

My sincere thanks to each government that participated. Without your participation there would have been no conference. So to my counterparts and my colleagues of each government, a special thanks.

To the automobile industry, as much as you may not love us, my sincere thanks. I know that each member of the automobile industry worldwide put a lot of work into this conference, not only in the presentation of papers, preparation of materials, but in the extension of resources. We feel the attitudes have been good. We feel that the top people have participated and so we thank you, all of you in the auto industry for making this conference the success that we feel it has been.

A special note to Daimler-Benz, I think this has been a magnificent facility, I don't think anyone could come to this meeting without looking around and saying "pretty neat," "very nice." The refreshments, the lovely girls, the excellent surroundings, and by no small measure, I would like your recipe for your sun dance. The weather has been superb and at this time of year this is no small feat. I don't know how we at TRANSPO 72 are going to duplicate your castle. We have thought of the Library of Congress, the White House and I don't think that we can top that. An extra special thanks to Daimler-Benz for being the host industry, a great job was done and we're most appreciative. So to each of you who came, to each of you who participated, to each of you who worked so hard, my special thanks, we look forward to seeing you all at TRANSPO 72.

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## PART 3

### CLOSING ADDRESS OF THE REPRESENTATIVE OF THE FEDERAL MINISTER OF TRANSPORT

**Mr. Helmut Wagner**, Ministerial Director,  
Federal Ministry of Transport, Federal  
Republic of Germany

Mr. President, ladies and gentlemen,

Please, allow me to add three observations to what the previous speaker has said.

We have all heard with admiration which wealth of material industry have prepared to promote the idea of traffic safety, but we have also seen that in each country millions of monetary units have been spent for investigating the same things. This fact gives rise to the question whether we cannot unite in our work, at least in those fields where we have common interests, where we are not competing with one another, in order to achieve by joint work what can be so achieved. This refers firstly to research work, to biomechanics, which can be examined in the same way everywhere. Is it possible to distribute research projects? Can time and costs be saved in this way? It concerns secondly the statistics, the function of which is to prepare a programme, which must be incorporated into the current statistical programmes — a rather difficult job — and which should be as much as possible the same for all those participating so that comparable results may be obtained. Finally, there are the test methods with which to ascertain, whether this or that technical characteristic prevails. All this we can achieve through the cooperation, which has been proposed here, above all by the American delegation.

Then there is the second item: We have in Europe a multitude of national legislation, which all have their

own — and different — technical regulations. This means for industry that they have to go to great expense, in order to adapt themselves in each individual case. The idea of standardization suggests itself, and this idea has been the determining factor in our work here at this conference.

We shall be compelled to standardize, when the safety vehicle will have been created. We shall be forced to harmonize the regulations, and so eliminate an obstacle to trade, which at present still swallows up a lot of money without adequate advantage.

I want to express my thanks to the members of the American delegation with their leader, Mr. Toms, in the first place because they have devoted themselves to these problems and because they are prepared to cooperate with us.

I also want to thank you, Mr. Chairman, for the excellent way in which you have presided over this conference and have made it a full success.

It is also my wish to thank all the gentlemen from industry for the share they have had in this quite outstanding event, either by their scientific contributions or in its organization. All these accomplishments fill me with confidence that the next meeting will bring new progress, and I can only recommend that in the meantime industry and the competent authorities in every state consult each other, in order to find ways how to ensure that the next conference will lead to further progress.

Thank you, gentlemen, thank you, Mr. Chairman, and many thanks to the American delegation.

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## PART 4 CONCLUDING REMARKS

**John A. Edwards**  
*Acting Associate Administrator  
for Research & Development*  
Research Institute,  
National Highway Traffic Safety Administration

As your chairman, I would like to make a few closing comments. We have had a very effective coming together here at Sindelfingen. Clearly, we identified limitations on current statistical data and dummy response. We demonstrated considerable concern for vehicle producibility and cost benefit factors. We also collectively recognized that the ESV specifications we are working with today are actually maximized and that ultimately we must optimize these specifications based on our developmental experience, and on the real world mix of

large and small cars. We also require time because of the complexity of the project.

I'd like to make a personal observation. It is all too easy for us to become disillusioned, by the obstacles confronting us. We must not be dissuaded from our goal. I believe this challenge of improving road safety is one that we can accomplish. I believe the ESV program is a major milestone along the way.

I want to further comment on the genuine and honest openness that is clearly developing between delegations in this ESV program. There is an obvious commitment by all delegations to truly attacking and solving the road safety problem. This perhaps was the hallmark of our conference. I am honored to have been able to serve as your chairman, and at this point I now declare the Second International Technical Conference on Experimental Safety Vehicles, closed.