WORK SESSION
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DESIGN AND CONSTRUCTION OF SAFE ROADS AND STREETS

Moderator

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Panelists

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INTRODUCTIONS

Glen M. Kelly is Assistant State Highway Engineer for Preconstruction at the Transportation Cabinet. A native of Danville, he has a BS degree in civil engineering from the University of Kentucky. He began working part time for the Department of Highways in 1965 as a student and full-time in 1970.

Dr. Daniel Turner is head of the Civil Engineering Department of the University of Alabama. He spoke at the Forum this morning.

David Oliver is Deputy Assistant Chief Council for the Motor Carrier and Highway Safety Law Division of the Federal Highway Administration. Dr. Oliver received a J.D. from Washington and Lee School of Law and an L.L.M. from Georgetown University School of Law.

Tom Layman is Assistant State Highway Engineer for Construction at the Cabinet.

OPENING REMARKS

As you are no doubt aware from listening to the speakers this morning, the theme of this Forum is Traveling Safely in Kentucky. The emphasis has been on motivating each of us to consider safety in every aspect of designing, constructing, and using the highway system. Traffic accidents, whether they result in property damage, injuries, or, at worst, fatalities, affect us all.

In this work session, we'll be taking particular interest in the areas of design, construction, and standards—the nuts and bolts of the field of transportation safety.

We have a dramatically changed society in America and, to meet the needs of those whom we serve, we must be aware and be able to adapt to them. No longer can we design a highway or structure based on standards that worked for past decades. Today's population is changing; not only is the number of people using the highway system increasing, but the age of the average driver also is escalating.

When the automobile first rolled in the early years of this century, the average life span was much less than it is today. In 1890 only four percent of the population was over 65 years of age, while today over 12 percent of the population is in this age group. By the year 2020, 17 percent will be over 65 and almost half of those will be over 75 years old. This means that over 50 million people of that age group will be eligible to drive on our highways.

According to the Urban Studies Center at the University of Louisville, the number of people over 65 years of age in Kentucky by the year 2020 will...
represent more than 19 percent of the population. This, coupled with the drop in the teenage population percentage from today's 32 percent to approximately 21 percent, presents a different picture for society in the twenty-first century.

Are we prepared for this change? Is our highway system designed for this new consumer? Are we geared to shift from concerning ourselves with the problems of teenage drivers to the concerns of the elderly? No, we're not, but we will be.

When research was performed in 1940s to determine the current letter height for our road signs, only seven percent of the population was over 65. Most drivers in this age group are physically capable of safe driving; however, it's been proven that with age, a person's perception of light diminishes.

The twenty-first century will bring a new profile of driver to the road; the aging population that will be driving in the next 20 to 30 years will include many of us. The automobile has become such an integrated part of our lives that it's second nature for us to travel extensively and, if anything, this dependence on highway travel will increase as the years go by. With improvements in the health field and with emphasis on physical fitness, the older population is healthier and more affluent than the senior citizens of years past.

The Transportation Research Board has initiated a study on the mobility and safety needs of older persons. The Board's findings show that over 80 percent of trips by those 65 years or older are in automobiles. This is due to the fact that the population is steadily moving from the inner city where mass transit is available to the suburbs where mostly the only way to travel is by car. Current statistics indicate that, although they are quite capable of driving safely, drivers 75 years of age or older are more at risk of being severely injured or killed in an automobile crash than younger drivers. We have time to correct the problems associated with this aging population, but we must start solving these problems now.

One example of current needs in transportation design relates to traffic signs. Current signs used by highway departments throughout the United States have been adequate for a number of years; however, the design standards of 1940 were not targeted toward the older citizen. Assuming that a one-inch letter is visible or legible at 50 feet, the current standard roughly corresponds to a visual acuity of 20/25, which exceeds the visual ability of about 40 percent of the drivers over 65. Since this percentage is increasing, we recognize that some rethinking along the lines of road signs and pavement markings may be necessary. With improved signing standards, the older drivers, as well as the rest of the population, will benefit. Remembering who we're serving and keeping the safety of our traveling public in mind when we design and construct highways is of primary importance.

Many solutions have been proposed to alleviate the problems of older drivers, from requiring them to be retested on a regular basis to not allowing them to drive at all after reaching a predetermined age. To me the former solution is undesirable and the latter solution is unacceptable. Our highways should be available for all citizens capable of using them and finding ways to keep this service available to as many people as possible is of paramount importance. Not all of our older citizens are drivers, still, they are a concern to us. Some people, because of the physical or monetary limitations, are
unable to rely on private automobiles for their transportation needs. For such people walking is the most frequently used mode of travel. Walking is important, not only as a means to shop and visit friends, but as a means of exercise. Road facilities must be planned and designed for everyone, not just senior citizens.

Not all safety hazards are under our immediate control. Driver inattention is listed as the main cause of accidents, with unsafe speeds and alcohol involvement listed as contributing factors. Designing a highway system to accommodate those under the influence of alcohol and speeders would be impossible, but, with the help of law enforcement personnel and the Legislature, we will do our best to protect the motoring public from these menaces. No longer are faster speeds necessarily better; it is the convenience and safety of every user of the highway system that is meaningful to us.

The engineering profession is changing as the needs of society change, I ask each of you to take seriously what you learned during this Forum and in this workshop.

I placed a special emphasis on the older drivers as a standard to meet when considering changes in the way we think about highway design and construction. Catering to their needs serves us twofold. When we meet the minimum needs of those who are having the most problem with the system as it is today and who will be sharing a considerable portion of this system, we will all stand to prosper. We take our mission seriously and any shortcut that compromises the safety of our people is unacceptable.

**DESIGN—A BEGINNING STEP**

*by Glen Kelly*

I would like to thank Calvin Grayson for including me and the other people from the preconstruction area in this work session and the Transportation Forum.

In the construction and the design areas of the Transportation Cabinet, we feel we are considering transportation safety from the ground up. The preface of our highway design manual includes a paragraph which states, "the prime importance is the design and construction of a modern, safe, and functional network of highways that serve the national defense and the citizens of the Commonwealth and be a credit to the Department and the Commonwealth. To this end the designer must be of conscientious effort to geometric design features, construction, and right-of-way cost, arraign traffic volumes, utility maintenance, and safety." The terms "safe" and "safety" are problems in this statement in forming the basis of most of our designs.

If you drive the roads in this state and drive through construction work zones, you'll see that we are addressing safety in our design process.

I'd like to take a few minutes to comment on our design standards, design processes, changes in the design area, traffic control, and risk or liability.