

Section 1: The Basic Facts

Data, Facts, and Statistics

National Risks and Fatalities

Approximately 30 million of our nation’s 200 million drivers are currently age 65 and older. Last year alone, an estimated 7,000 people age 65 and older lost their lives in traffic crashes across our nation.

National Data

Because older Americans (particularly after age 75) tend to drive and travel somewhat less than younger and middle-aged people, their elevated risk of crash involvement, especially fatal crash involvement, may not be readily apparent. However, the risk of fatal crash involvement per mile driven rises dramatically after age 70. Statistics show that:

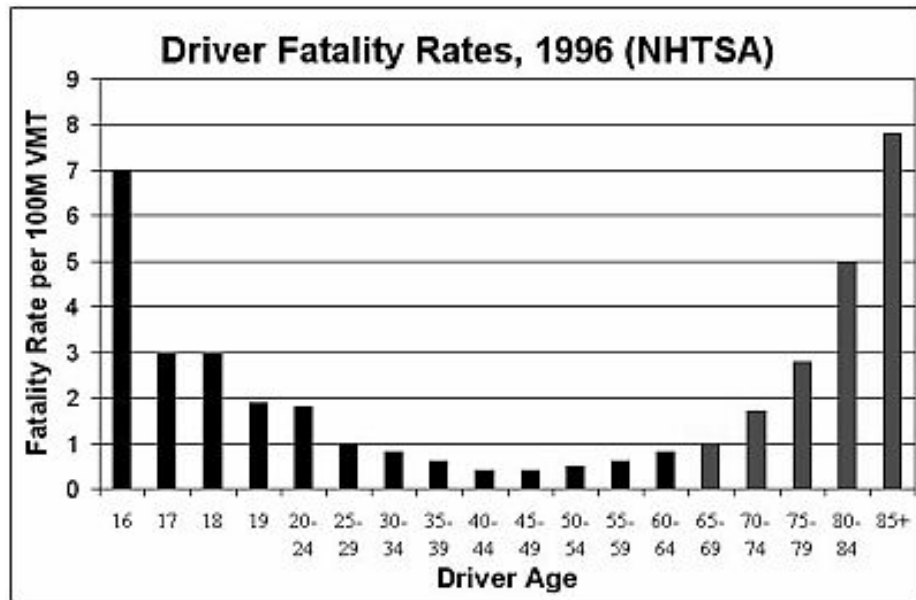
- ? On a per capita basis (per 100,000 population) people age 65 and over are more likely to be killed in motor vehicle crashes than any other age group with the exception of people age 16-24.
- ? The fatality rate for drivers in the oldest group is nine times higher than the rate for drivers aged 25-69 years.
- ? The risk of crash involvement per mile driven rises dramatically after the age of 70.
- ? By age 85, drivers average eight fatalities per 100 million vehicle miles. That’s the highest fatality rate for any age group. This is based on National Highway Traffic Safety Administration (NHTSA) estimates from the mid 1990s.

It has been a remarkable century. When I was born in 1912, I could expect to live to the age of 47. Today I am nearly twice that age, and a child born today can expect to live to age 77. We are staying alive and healthy longer than ever.
- Art Linkletter

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The Driving Age Continuum

From our first driving experiences as newly licensed teenagers to the end of our driving as elderly seasoned drivers, we experience a range of changes in our experience, physical ability, and cognitive skills. The following chart represents the fatality rates over the age continuum:



Ages 16-24

Risk is very high, drops in the first year, and continues to decline. Drivers learn from driving experiences and mature in driving judgment.

Ages 25-64

Risk declines gently with maturity and lifestyle changes in these 40 core years of driving. Between age 40 and age 50, risk is at its lowest levels and then begins to rise again by age 50-55, when most drivers begin to experience vision changes and other signs of aging.

Ages 65-69

Risk rises again as many of us experience more physical changes with aging. As drivers' lifestyles change, habits and aging-related changes in how drivers think and act begin to redefine safe driving capacity.

Ages 70 and above

Each five-year age increment shows a marked increase of risk to the aging driver, as many more medical factors come into play.

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Iowa Population and Trends

- From “What Iowa Data Says—A Summary of Facts” by Robert Thompson, Program Evaluator, Iowa Governor’s Traffic Safety Bureau, Department of Public Safety

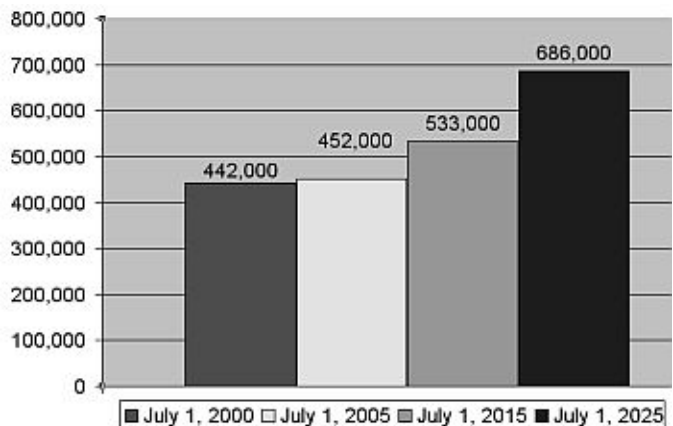
How fast are Iowans aging? Quickly, as the following information demonstrates.

- ? Iowa ranks 4th in the nation in our percentage of population over age 65.
- ? Iowa ranks near the top in all older driver percentage age groups—second only to Florida in drivers over age 85.
- ? More than one Iowa driver in six is age 65 or older (350,000 people).
- ? A 30% increase in the number of Iowans over the age of 65 is expected by the year 2020.



Population Growth of Age 65+

Census projections provided by Iowa State University’s Department of Sociology indicate that Iowa’s population of people age 65 and older will grow from just more than 440,000 to more than 680,000 by the year 2025. By 2015 there will be nearly 100,000 more Iowa senior citizens than there are today.

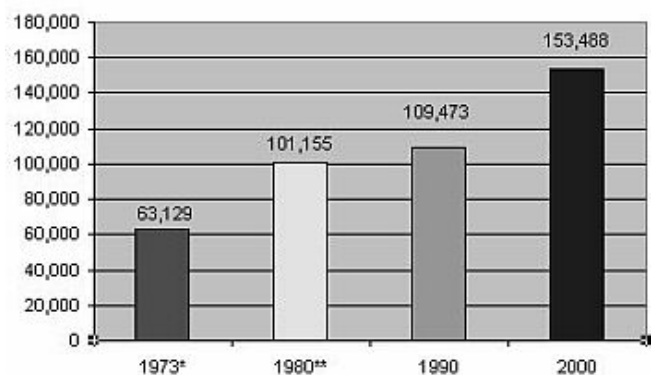


Iowa Drivers of Age 65+

Nearly 80 percent of Iowa’s current seniors are licensed drivers. If this population trend continues, Iowa could have nearly 540,000 licensed drivers age 65 and older by 2025. This would represent an increase of nearly 60%—almost 200,000 additional Iowa senior drivers.

The number of 75-and-older drivers has grown significantly since the early 1970s, as shown in the chart here

Number of Iowa Drivers 75+



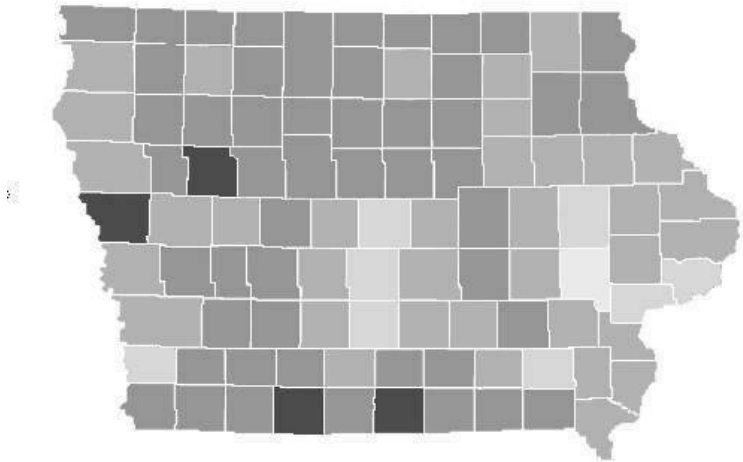
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Rural Growth

The growth in the number of senior drivers is most readily apparent in Iowa’s rural counties.

In 53 of the state’s 99 counties, people age 65 and older represent 20 percent or more of the driving population.

In four of those counties (Sac, Monona, Wayne and Ringgold), more than 25 percent of today’s drivers are 65 and older; only one county has under 10 percent.



Color	Percentage of Drivers of Age 65+
(Lightest gray)	Under 10%
(Light gray)	10-14%
(Medium-light gray)	15-19%
(Medium-dark gray)	20-24%
(Darkest gray)	25% and up

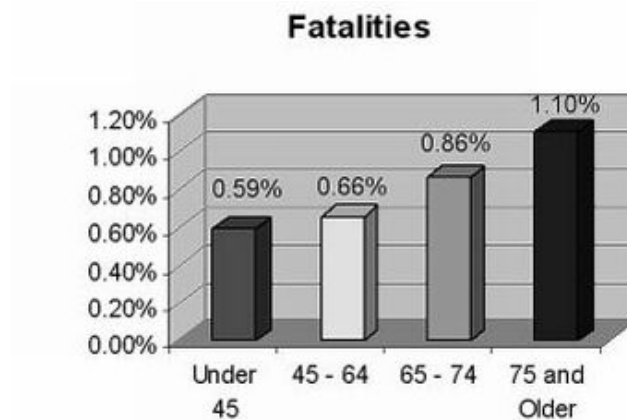
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Iowa Fatalities and Injuries for Senior Drivers

- From “What Iowa Data Says—A Summary of Facts” by Robert Thompson, Program Evaluator, Iowa Governor’s Traffic Safety Bureau, Department of Public Safety

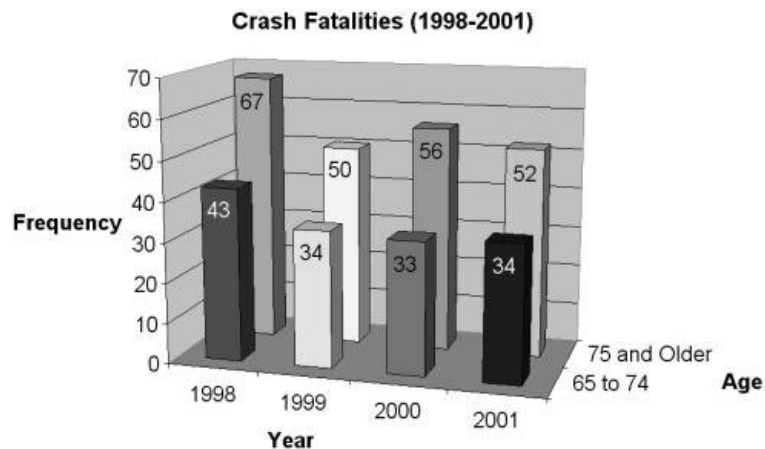
Fatality Rates by Age Group

Seniors age 75 and older are fatality victims in one of every 90 crashes in which they are involved. In contrast, people under 65 are fatality victims in only one in every 160 crashes. Fatality rates for different age groups are shown in the following chart.



Fatality Rates of Seniors

Since 1998, a total of 369 people age 65 and older have been killed in Iowa crashes, an average of 92 per year. In 1998 alone, more than 100 older people perished in Iowa crashes. Senior citizens make up 20 percent of all Iowa traffic deaths. When seniors get in crashes they are more likely to be killed than any other age group. Fatality rates for senior age groups are shown in the following chart.

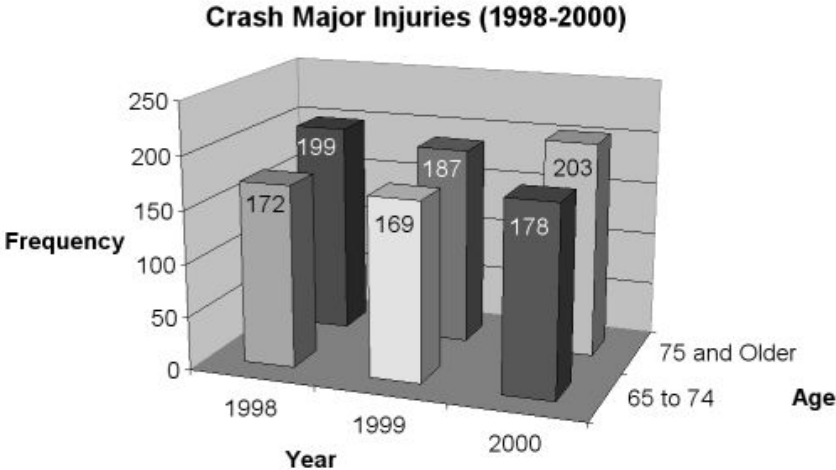


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Injury Rate of Seniors

Major injuries for older Iowans in traffic crashes total between 350 and 400 per year. People age 75 and older are more likely to die or be seriously hurt than younger seniors ages 65 to 74.

The following chart demonstrates the injury rates for senior age groups in different years.



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Iowa Crash Types for Seniors

- From “What Iowa Data Says—A Summary of Facts” by Robert Thompson, Program Evaluator, Iowa Governor’s Traffic Safety Bureau, Department of Public Safety

Types of Crashes for Seniors

Three types of crashes are more likely to involve senior drivers than younger drivers.

- ? Senior drivers, particularly those age 75 and older, are significantly more likely to be involved in crashes involving failure to yield at stop signs. In fact, they are twice as likely to be at fault or involved in this type of crash when compared to drivers under the age of 65.
- ? Seniors age 75 and older are significantly more likely to be in crashes involving left turns.
- ? Older drivers are more likely to be involved in intersection crashes than younger drivers.

The statistics are shown in the table below.

Failure to Yield Right-of-Way (FTYROW) from Stop Sign

The statistics are as follows:

Under 45: 6.87%

45 – 64: 7.39%

65 – 74: 10.27%

75 and Older: 14.11%

Failure to Yield Right-of-Way (FTYROW) Making Left Turn

The statistics are as follows:

Under 45: 6.09%

45 – 64: 6.34%

65 – 74: 7.70%

75 and Older: 10.52%

Intersection Crashes (General)

Nearly 60 percent of all crashes for drivers age 75 and older are intersection-related, as opposed to 47 percent for drivers under the age of 45.

This may relate to more complex decision making at intersections. It also may reflect that seniors are driving more in town as they grow older.

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Physical Changes

Descriptions of Several Physical Changes

– From “Defining the Changes and Challenges of Normal Aging and How They Affect Driving” by Dr. Levi Spohnheimer, Trainer, AARP 55 Alive Driver Safety Program

Vision, reaction time, and several other factors all help to shape drivers. This presentation outlines some of these factors and their effects. Our conclusion is that we must:

- ? Learn to focus diligently and single-mindedly on our driving to continue driving safely.
- ? Be aware of changing health conditions and how they affect driving.
- ? Change plans and adjust habits to take safer routes at safer times.



Vision There are a number of physical changes associated with eyesight and aging.

Eye Lens

The lens of the eye becomes progressively cloudy and yellow with age, giving faulty information to use for decisions made while driving.

Reading Light

A 50-year old needs five times as much light to read as a 20-year old, while a 60-year old needs 10 times as much light to read as a 20-year old.

Depth Perception and Peripheral Vision

With age, people also lose depth perception and peripheral vision, which affect the ability to judge distance and speed.

Memory Benign forgetfulness can result in forgetting to respond to a stop sign, to turn on a turn signal, or to watch for changes in other drivers' behavior.

Medical An accumulation of injuries, disease, and medications can cause other changes that affect the ability to drive in addition to normal aging.

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Reaction Time

Reaction times change with age.

Braking Time

A 20 year old takes three-quarters of a second to react and brake. The older driver can take up to 1.5 seconds because of chemical changes in the brain.

Brain Chemistry

Chemical changes in the brain cause us to lose six percent of the chemical connections in the brain per decade, beginning at age 20.

Mobility

Several changes occur that inhibit our mobility, including changing muscle mass and joint problems.

Muscle Mass

Men lose about one percent of muscle mass per year beginning at age 30, typically losing one-half by age 80. Women fare better.

Joints

Stiffness in the joints, ligaments, and tendons make turning to look for traffic and responding with braking or turning more difficult.

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Cognitive Changes

Dementia

– From “Predictors Of Safe And Unsafe Driving – Dementia, Alzheimer’s And Other Neurological Disorders” by Dr. Matthew Rizzo (The University of Iowa College of Medicine, College of Engineering, and Public Policy Center) and from the *Driving with Diminished Skills* Iowa DOT brochure

The *Driving with Diminished Skills* DOT brochure defines dementia as a disease of the brain causing a slow, steady decline in memory, reasoning, and other thinking tasks. Drivers with dementia may become lost, have near misses, or may be involved in crashes. Individuals with dementia:

- ? Are twice as likely to be involved in a traffic accident as other drivers the same age.
- ? May drive for up to three years after they have been diagnosed with the disease. Data indicates that 50 percent of people with Alzheimer’s disease do so.

Testing and Evaluating

The slowly progressive nature of dementia often eludes notice or definition until someone’s safety is at serious risk. Individuals with dementia experience “good days” and “bad days”. It seems they are often at their best when appearing at the DOT for a license exam or at their doctor’s office for a medical exam.

Information processing and decision making abilities are not measured by just a vision test. Thus, passing a vision screening test may not be enough to prove safe driving capacity for people experiencing aging and cognitive changes. As Dr. Geri Hall said in some cases, “The eyes have taken the picture, but the brain is not developing the film.”

The Emotional Decision

Dementia and Alzheimer’s disease can present difficult emotional and physical problems for drivers and those who care about them. This subject is further discussed in the section “About Older Drivers and Their Decisions.”

Dementia and driving is more than a safety issue. It is also an economic reality in driving-related insurance payouts. The top three payouts by risk categories are inexperienced drivers, drinking and driving, and third—dementia. We’ve made progress in reducing drinking and driving and implementing the graduated drivers license for inexperience, but we have done very little to address the issues of dementia and driving.

– Becky Groff, President, Iowa Alzheimer’s Association Coalition (IAAC)

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Testing for Effects from Physical and Cognitive Changes

SIREN: Researching into the Effects on Driving by Physical and Cognitive Changes

– From “Predictors Of Safe And Unsafe Driving – Dementia, Alzheimer’s And Other Neurological Disorders” by Dr. Matthew Rizzo, The University of Iowa College of Medicine, College of Engineering, and Public Policy Center

The driver must act rapidly upon feedback of safety errors while also monitoring travel goals, vehicle integrity, and personal state for signs of fatigue or other incapacity that would compromise safety. Aging and neurological disease (dementia/Alzheimer's) can disrupt these functions, increasing the risk of driver safety errors that lead to vehicular crashes and resulting injuries.

One problem is to determine how to test the effects of mental disorders on driving.

As a solution, the University of Iowa has developed the SIREN driving simulator. SIREN is the Simulator for Interdisciplinary Research in Ergonomics and Neuroscience, and is the only in-hospital driving simulator in the world. This simulator creates an immersive real-time virtual environment for assessing at-risk drivers while seated in a real car in a medical setting. The computer creates the driving environment. Vehicles interact with the driver, the road surfaces, and each other according to experimental needs. Driver’s collisions with these vehicles and other entities are detected as part of the data collection.

**The
Complex
Task of
Driving**

Automobile driving is a complex task. Drivers must:

- ? Monitor multiple objects and events despite being unsure of where critical hazards are;
- ? Code inputs from central and peripheral vision and the other senses;
- ? Allocate attention among onboard and roadway targets and distracters;
- ? Remember road rules, routes, vehicle operations, and other vehicle positions; and
- ? Carry out effective decision-making and execution.

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Involve the Experts A comprehensive approach to the problem should involve experts in vision, cognitive science, and automotive design and safety. We do not understand the perceptual and cognitive bases of errors in drivers with cerebral visual disturbances. Unsafe drivers may be unaware of their impairments, so they do not compensate for their greater risk.

The Challenge Our challenge is to analyze driver performance of “off-road” tests of visual perceptual and visuomotor abilities, attention, memory, and executive functions. We can assess driver performance from driving simulation, instrumented vehicles, and state driving records. Then we must determine which visual and cognitive impairments contribute to specific driving errors and crashes based on driver performance. Understanding how the brain processes visual signals helps us understand how drivers with visual impairments may fail at the driving task.

We are now applying SIREN in research studies on safety of drivers with aging and age-related neurological disorders. This research helps assess driver capacity and predict which medical conditions may affect a person’s safe driving capacity.

- Dr. Matthew Rizzo, The University of Iowa College of Medicine, College of Engineering, and Public Policy Center

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The Decision to Drive

Deciding When to Quit

- From "Active Aging Americans – Sustaining Safe Driving" by Michael Seaton, National Director, AARP 55 Alive Driver Safety Program

There are more older drivers today than ever before, and there is more need for accommodation for and education about them. Today’s seniors are living longer, retiring earlier, living healthier, are more apt to travel, and more women are driving. We need to be proactive in helping today’s seniors make safer mobility decisions and to prepare for the next generation of seniors who will grow in number and demand services and their independence.



Deciding Whether to Continue Driving

An AARP survey addressed how seniors make these driving decisions:

- ? 75% of older drivers stop driving because of their health. The number one health reason cited is vision.
- ? 70% thought about other options before deciding to stop driving.
- ? 70% decided they would depend on others for help before they decided whether to stop driving.
- ? 20% know someone (friend or family) they believe should stop driving.
- ? 82% of driving cessation decisions are made alone.
- ? 68% are not influenced by anyone else.

Credible Sources to Consult

According to the seniors surveyed, the most credible sources to consult when making a decision about safe driving were:

1. A doctor
2. The police
3. A son or daughter

Discussing the Decision with Parents

According to the adult children of seniors surveyed:

- ? 65% never spoke with parent about driving.
- ? 50% were reluctant to discuss driving concerns.
- ? 82% would discuss it when they consider it life threatening.

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The Tough Decision: Anecdotes

As Art Linkletter pointed out, making the decision whether to continue driving is a hard one for all concerned. He said, “In America, independence is very closely linked to the automobile. We all like to think we are pretty good drivers and we hate to give it up. The driving decision is about more than independence and what you want. Like it or not, you’ve got to be on alert that you’re getting old and you can’t drive forever.”

Three personal stories are briefly described below, illustrating the process’s inherent difficulties.

Art Linkletter

Art Linkletter is known to Iowans as a television celebrity whose shows have been viewed by American families for the past 50 years. At age 90, he still drives his car almost daily on Los Angeles freeways. He works tirelessly as an activist for senior citizens, and as an author, speaker, volunteer, and businessman. In addition to writing a book on aging, Mr. Linkletter is chairman of the board of directors for the UCLA Center on Aging.



He talks often about aging and shared these anecdotes and observations with Iowans in the forum. In “To Drive or Not to Drive? - Making Lifestyle And Driving Decisions With Aging,” Mr. Linkletter notes that:

In the past few years [through the UCLA and the United Seniors Association] I have learned a lot more about physical and mental challenges of aging. We can each follow all the good advice on healthy diet, mental stimulation, and exercising. In so doing, we are making life-saving decisions to live longer and more fully. Nevertheless, we each need to be alert that we are getting old, and this whole business of aging has application to driving.

Mr. Linkletter’s observations about aging and driving are not just clinical. Last year, when a longtime friend and successful executive couldn’t find his way to their familiar local restaurant, his wife asked Art to intervene. Mr. Linkletter did so, but his friend was determined to keep driving because he enjoyed driving so much, despite testing positive for early Alzheimer’s disease. Finally, Art described his family losing not just him, but also the family fortune if he should have a car crash and be at fault. This tangible argument about his family’s loss of fortune hit home and convinced him it was better to stop driving.

I said to my friend, ‘You cannot drive. It is against the law for you to drive.’ Suppose you had an accident and it was known that you had deliberately continued driving when you knew you shouldn’t?’ I told him, ‘Your driving days are over unless you want to risk your family fortune’ and he stopped driving. It was a difficult thing for him to do, and a difficult thing for me to do. Between wives and husbands it is very important to be firm about these things. An at-risk driver continuing to drive can injure or kill someone else. It is that simple and it is that important.

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Sally Taylor

In “Choices - Not Chances”, the Iowa older driver video screened at this forum, Sally Taylor describes the day she was the driver at fault in a crash that killed her husband.

In her tragic loss she learned that all drivers—and especially aging drivers—must be more attentive and consciously work to maintain good driving habits.

Now she is a volunteer instructor for AARP’s driver safety program and teaches other seniors ways to improve their driving and avoid a tragedy like hers.



Faye Thompson

Faye described her struggles with her very bright and independent mother who has been diagnosed with Alzheimer’s disease in the presentation “Dementia and Driving - A Daughter’s Story,” with Dr. Geri Hall of the University of Iowa.

Faye offered these examples of two driving incidents that demonstrate how Alzheimer’s disease has affected her mother’s ability to drive safely, and how her concentration is limited to her own interests.

- ? In one case, concentrating only on getting to her destination, Faye’s mother drove on a multi-lane road in a retail business area for more than a mile at 65 miles per hour weaving through traffic and crossing the centerline. She was “on a mission” and didn’t remember that traffic laws did apply to her – even if she did have an errand to finish.
- ? In another case, she was frustrated when a car ahead of her would not leave the intersection and used her vehicle to push the stopped car out of her way. She had not noticed that an officer was directing traffic at this intersection for a funeral procession.

As with many Alzheimer and dementia patients, Faye’s mother can function very well in some situations, and she doesn’t always exhibit signs of dementia. But, when it comes to her ability to reason, especially outside her own interests, in the words of Geri Hall, “Her ‘reasoner’ is broken. The fact that it is not safe for her to drive does not, and will not register with her.” Still, Faye’s mother is adamant that she is safe to drive.

Driving has been the largest of our battles so far. It is very wearing for families. It is also very wearing for law enforcement and the driver’s license people. They have all been incredibly patient and helpful through this ordeal.

- Faye Thompson

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Initiatives and Public Policy

The Responsibility for Action

- From "Safe Mobility for Americans Aging in Place" by Jim Green, NHTSA Region VII, and other sources.

What will happen if we do nothing? Fatalities could triple from 7,000 to 21,000 older Americans dying in vehicle crashes each year.

No single organization alone can undertake the responsibility of meeting the safety needs of our maturing society. We need to maintain safe mobility, reduce the number and severity of fatalities, and increase well-being for all older adults. Responsibility must be shared.



Shared Responsibility

Success requires the actions and resources of many diverse interests groups such as:

- ? Federal agencies
- ? Congress
- ? States
- ? Counties
- ? Municipalities
- ? Health and social service professions
- ? The private sector

We need to continue talking, planning and having forums, but at some point, very soon, we need to start implementing programs.

- Jim Green, NHTSA Region VII

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Organizations Represented at the Forum

Across the United States, many public and private sector disciplines are addressing the safe mobility needs of our growing elderly population. This includes:

- ? Involved groups representing national agencies and service provider groups
 - ? The U.S. Department of Transportation (DOT)
 - ? The American Automobile Association (AAA)
-

Involved Organizations

Some of the groups involved in the forum include:

- ? The U.S. Department of Transportation (DOT—all transportation modes). “Safe Mobility for Life” is a departmental planning goal.
- ? National Highway Safety Administration (NHTSA—people), responsible for the *Safe Mobility Handbook* and *National Agenda for the Transportation Needs of an Aging Society*
- ? Federal Highway Administration (FHWA—pavement), responsible for the *Older Driver Highway Design Handbook*
- ? Transportation Research Board (TRB—research scientists), responsible for the *Update of Special Report 218 – Transportation in an Aging Society*
- ? American Association of Motor Vehicle Administrators (AAMVA—licensing), responsible for “Grand Driver” social marketing
- ? American Medical Association (AMA—doctors), responsible for the development of driver health assessment guidelines
- ? American Association of State Highway Transportation Officials (AASHTO) studies
- ? American Automobile Association (AAA—motorists), responsible for the Three-Year Mature Driver Priority Program and driver safety courses
- ? AARP (seniors) the 55 ALIVE Driver Safety Program and public policy studies

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The United States Department of Transportation

The U.S. DOT has adopted “Safe Mobility for Life”, as a departmental planning goal. This goal strives “To preserve independent functioning, to retain the dignity and self-esteem that result from providing for one's own mobility needs as long as it is possible to do so without unacceptable risk to oneself or to others.”

Mobility for Quality of Life

The U.S. DOT asserts that mobility is central to quality of life. There is a well-established link between restricted mobility among older people and the onset or acceleration of diverse physical and mental health problems. Costs to society to provide care for seniors who lose their mobility also rise dramatically.

DOT Efforts

- This will require efforts in five areas:
- ? Keep people operating cars as late in life as possible, as long as they can do so safely.
 - ? Promote technology and training that supports those with functional or cognitive deficits so they can continue to operate vehicles safely.
 - ? Improve screening and evaluation techniques to detect when people should no longer be operating a vehicle.
 - ? Provide alternative transportation for older adults who can no longer drive.
 - ? Educate the public on how to maintain safety as they plan for their transportation needs in later years.

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The American Automobile Association (AAA)

- From "The American Driver" by Charles Butler, Director, Traffic Safety Services, AAA (American Automobile Association)

AAA is a federation of state and local chapters that total 45 million motorists and travelers in the U.S. and Canada. The AAA's 100 year old mission is to save lives and reduce injuries by preventing traffic crashes. It has done so in part by engaging in a range of information campaigns.



Priority Campaigns

The association identifies priorities and focuses resources on one topic for multi-year campaigns. Recent campaigns have included "Crisis Ahead" to promote roadway infrastructure improvement; "Young Drivers" to develop resources and enhanced training; and "Child Passenger Safety" to raise awareness and proper use of child seats.

The Mature Drivers Campaign

Mature drivers were named a priority in December 2001, and an extensive program will begin rollout in 2003. The goal is to help seniors stay mobile as long as safely possible. The program will utilize advocacy, research, education, public outreach, programs, and services. The AAA's focus is to find mobility solutions for older drivers and their families through three means:

Identify Gaps in Research and Services

This includes assessment, retraining, and counseling. AAA offers driver improvement programs in 60 clubs. Soon local club offices will offer visual/cognitive assessment services and behind-the-wheel driver assessments. AAA Foundation conducts research as subject areas are identified.

Pursue Policy Changes

This includes licensing, road design, and transportation alternatives. AAA supports legislation, such as California and Missouri's "model laws" of non-age-specific provisions for doctors, family members, and others to recommend evaluation for drivers they believe to be at risk. Other bills addressing vision testing, insurance rate reduction incentives for training, mandatory training, and other older driver issues are pending in many states.

Conduct Outreach

This includes raising awareness, disputing myths, and educating groups. AAA clubs and the AAA Foundation provide a wide range of educational materials, the <http://www.olderdrivers.org> web site, and public awareness efforts.

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Summary of Safe Mobility Decision Efforts

It is apparent that efforts from a wide range of disciplines and entities will be required to address safe mobility decisions for our older drivers in the next two decades.

Necessities Safe mobility decisions must include:

- ? Self awareness.
- ? Conscious compensation for medical and cognitive changes. This includes addressing the older drivers, the vehicle, and the roadway environment.
- ? Decisions to change our driving patterns or give up the keys.
- ? Intervention from family, licensing authorities, law enforcement, medical practitioners, or others.

Without the safe mobility decisions in these areas, everyone is more exposed to injury and death.

We can't afford to let a serious or fatal crash become the only intervention that works because we chose **not** to make decisions.