*C*rash *A*nalysis, *S*tatistics & *I*nformation *Notebook 2008*

*C*rash *A*nalysis, *S*tatistics & *I*nformation

Georgia Department of Transportation **January 2008**

Note About the Crash Analysis, Statistics & Information Notebooks

Try to think of anyone that you know that hasn't been affected by a car crash. More than likely everyone has had some sort of loss. Either they have been in a crash themselves or someone close to them has been in a crash. If they were lucky it only resulted in damage to their vehicle and the irritation of having to take time off work for repairs. Many unfortunately also were injured and some received injuries that were so severe their lives were changed forever. For others the loss was even greater, they lost someone they loved, a husband or daughter or brother or mother. For them the loss cannot be measured.

Throughout this document we try and bring the numbers into a human dimension. These are not just numbers in a database each number represents a loss. Boxes will highlight the data and put it in perspective to further document the risk. Photos from a variety of sources will be used to provide dramatic visual description. Traditionally crash data is often presented as single fact sheets highlighting a single factor such as 'Vehicle Type' or 'Road Type'. This document will try to show how the risk factors interrelate to produce a crash. Complete detailed analysis of each of the many risk factors and their complex interaction is beyond the scope of this document but special sections through out the document will be used to expand analysis on critical issues and bring the multiple crash contributing factors together.

In addition, a new section called 'Connections' will describe the varied and complex factors that contribute to crashes. The Connections sections are a compilation of different crashes and photos that illustrate crashes and the complexity of risk analysis. Narratives from crash reports by law enforcement officers and emergency medical technicians will be used to describe how the crash happened and the results. Data is only quantitative but the narrative is qualitative and shows aspects of the crash that can't be easily documented by simple numbers.

All data unless otherwise noted is from the Georgia Department of Transportation (GDOT). The motor vehicle crash data used in this document is from the Georgia Department of Transportation revised and released as of January 2008. For urban and rural designations pre-2003 census categories have been used because they more accurately reflect the roadway characteristics.

Risk -it is all about risk and the numbers clearly document the risk we all face on the roads. Reducing the risk involves understanding the specific factors and events that lead to a crash in order to design risk reduction measures and save lives. This is why this data is kept and why it is presented here.

Angelyn Rios

- **From 2000 to 2006 in Georgia over six million people were involved in a motor vehicle crash** either as a driver or passenger or pedestrian. That is on average 2,394 people each day. Almost one million men, women and children were injured in motor vehicle crashes in Georgia from 2000 to 2006. Over the seven year period crashes resulted in more than 2,500 injuries on average each week.

- **From 2000 to 2006 in Georgia, 11,435 people lost their lives** in motor vehicle crashes. On average 31 people die in crashes each week.

- **Three out of four fatal crashes occurred on two-way roads with no separation or barrier** they are the highest risk roadways. The majority of fatal crashes on two-way roads without any separation occurred in rural counties. Twice as many people are killed in crashes in rural Georgia counties as are killed in the five metropolitan Atlanta counties.

- **Off road fatal crashes accounted for 41 percent of all fatal crashes in Georgia in 2006.** Overturn and fixed object crashes pose the highest risk of injury or death to the vehicle occupants. In rollover crashes half of the occupants were either killed or injured. In fixed object crashes one out of three occupants were injured or killed. From 2000 to 2006 there has been a steady increase in rollover crashes. The number of fatal rollover crashes increased 41.2 percent from 2000 to 2006.

- **Horizontal curves are one of the major road characteristics that increase the risk of crashing.** In 2006, one out of two fatal off road crashes happened on a curve although straight roadway segments far outnumber curved roadway segments.

- **One out of three fatal crashes in Georgia in 2006 occurred on off-system roads** and almost all of these fatal crashes were on two-way roads without any separation. Of the off road fatal crashes on two-way off-system roads 62 percent were on horizontal curves.

- **One out of four fatal crashes in Georgia occurs at an intersection.** Sixty percent of the vehicles in fatal intersection crashes in 2006 were at an intersection without any traffic control. The highest number of fatal intersection crashes occurred in rural counties.

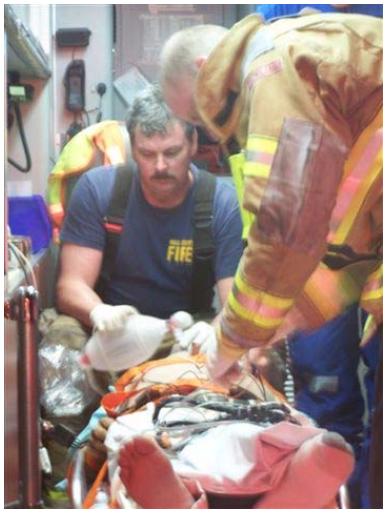
- **Crashes that occur at an angle account for 25.5 percent of the fatal crashes in Georgia in 2006.** From 2000 to 2006 there have been 2,618 angle fatal crashes in Georgia. Collisions occurring at an angle are the most frequent manner of collision at intersections. These occur when one vehicle is turning and struck from the side by another. Sixty-one percent of the vehicles in fatal intersection crashes were struck at an angle.

- **Rural counties accounted for 60 percent of the fatal rollover crashes involving pickup trucks.** In 2006, one out of three fatalities in Georgia occurred in a crash involving a pickup truck.

- **A higher proportion of pickup crashes were fatal.** The proportion of pickup truck crashes that were fatal was almost twice that of passenger cars. Pickup truck adult occupants have a lower seat belt usage than occupants of passenger cars and sport utility vehicles. The number of pickup trucks in fatal crashes increased 17 percent from 2000 to 2006. Even when adjusted for the increase in the number of registered vehicles the fatal crash rate increased 5.7 percent.

- **One out of six fatalities in Georgia occurred in a crash involving a large truck.** Of the 270 fatalities that occurred in crashes involving at least one large truck in 2006, 86.3 percent of the people killed were occupants of the smaller vehicle compared with 13.7 percent for the large truck occupants.

- **Almost one-third of the fatal motorcycle crashes occurred in rural counties.** The proportion of motorcycle crashes that were fatal was twelve times greater than that of passenger cars. Seventy-two percent of motorcyclists were either injured or killed compared with only 16 percent of the occupants of passenger cars. The motorcycle fatal crash rate increased 60.8 percent from 2000 to 2006. There has been a gradual but dramatic increase in motorcycle fatalities for middle age and older bikers. From 2000 to 2006, motorcycle drivers in fatal crashes under age 40 increased 117.1 percent. In contrast for drivers over age 39 the increase was 254.6 percent.



- **Almost five people died every day on average – more than 32 deaths each week**. Fatalities have increased from around 1,500 each year in the 90's to over 1,700 in 2005 and 2006.

- **In 2006 alone the number of injured children ages 5-9 would fill not 10 classrooms, not 50 classrooms but 128 classrooms.** For middle school age children ages 10-14 the number is even greater. The number of injured children ages 10-14 in 2003 would fill 148 Georgia classrooms.

- **In 2006, persons over age 74 were almost four times more likely to be killed than younger persons** under age 65. Of the persons over age 74 injured, 3.84 percent were killed compared with 1.12 percent for persons under age 65.

- **Unsafe or illegal speed is involved in one out of six fatal crashes in Georgia.** The number of speed related fatal crashes has increased from 2000 to 2006. The chance of being seriously injured is three times higher in crashes related to speed than crashes not related to speed.

- **Over 4 million drivers have been involved in crashes resulting in almost a million injuries.** That is on average 1,720 drivers each day – 72 drivers every hour. In 2006 alone 1,703 men, women and children lost their lives on Georgia's roadways.

- **One out of ten of the drivers in crashes in Georgia in 2006 had driver's licenses from other states** or countries. This proportion is even greater for drivers in fatal crashes. The majority of out-of-state drivers were from nearby states for both crashes and fatal crashes.

- **For all age groups rural counties have the highest number of drivers in fatal crashes and the highest driver fatal crash rate.** The fatal crash rate for drivers ages 16-17 in rural counties is almost double the fatal crash rate for drivers ages 16-17 in the five Atlanta metropolitan counties.

- **From before the Teenage and Adult Driver Responsibility Act went into effect in 1996 to 2006 the number of fatal crashes involving drivers ages 16-17 declined dramatically.** When comparing 1996 with 2006, the number of drivers ages 16-17 in fatal crashes declined 32.8 percent but the decline for drivers ages 18-20 was only 3.3 percent. In comparison the number of drivers over age 24 in fatal crashes increased 16.9 percent.

- **Older drivers often have older passengers. The older person's greater susceptibility to physical injury greatly increases the chance that someone in an older driver's vehicle will be seriously injured** or killed in a crash. The lack of adequate funding for EMS and trauma centers is a special problem in rural areas. This deficiency complicates the outcome for older persons who are more susceptible to injury and may have previous existing medical conditions.

- **The number of older drivers in fatal crashes in rural counties is almost three times greater than the number of drivers in fatal crashes in the other three regions.** In rural areas the lack of accessible public transportation necessitates driving on high risk rural roads. In addition the long distances to emergency care and trauma centers increase the risk of a serious injury leading to death.

- **From 2000 to 2006 on average three pedestrians were killed each week.** Forty pedestrians were injured on average each week. Pedestrians are 32 times more likely to be killed in motor vehicle crashes than vehicle occupants are.

County Level Data Tables –Rates per Vehicle Miles Traveled

County Level Data Tables –Rates per Population

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The sheer magnitude of the crash numbers document the risk we all face on Georgia's roads. The numbers are staggering. It is very difficult to look at these numbers and fully comprehend the losses. They are not just statistics: Each number represents a loss. Putting it all in perspective is hard to do because there are so many crashes, injuries and deaths it is hard to bring it down to a human scale. Risk -it is all about risk and the numbers clearly document the risk we all face on the roads.

- Since 2000 over six million people have been involved in a motor vehicle crash in Georgia either as a driver or passenger or pedestrian. That is on average 2,394 people each day.
- Over 4 million drivers have been involved in crashes resulting in almost a million injuries. That is on average 1,720 drivers each day.
- From 2000 to 2006 over one million drivers were involved in a crash where someone was injured and over 16,000 drivers were in a crash where someone died.

- In the last seven years 11,435 people have died in motor vehicle crashes in Georgia. On average, every Georgian will be involved in a crash every ten years. And that is the risk we face on the roadways.

Drivers, Crashes, Injuries and Fatalities

	2000	2001	2002	2003	2004	2005	2006	2000-2006
Crashes	309,768	317,851	327,774	331,612	342,922	348,061	342,534	2,320,522
Total Persons	824,820	849,335	871,308	874,256	899,821	908,142	888,919	6,116,601
Drivers in Crashes	585,916	603,217	621,439	626,906	649,649	658,263	648,339	4,393,729
Passengers	235,434	242,618	246,394	243,865	247,737	247,310	238,038	1,701,396
Drivers in Injury Crashes	159,796	164,476	165,090	165,709	171,818	173,925	167,048	1,167,862
Injuries	130,608	132,305	132,623	132,879	138,130	139,194	133,555	939,294
Drivers in Fatal Crashes	2,244	2,438	2,260	2,377	2,434	2,609	2,515	16,877
Fatalities	1,549	1,656	1,531	1,610	1,641	1,745	1,703	11,435

Driver data excludes pedestrians
Injury Drivers excludes drivers in crashes that resulted in a fatal injury.

It is all about risk. Even with the best roadway, the best driver, the best vehicle, the risk for a crash still exists.

- Each type of roadway possesses a unique combination of risk factors that are unique and inherent to the roadway design and construction. These risks can be reduced but not eliminated. There is no completely risk free road. *No road is completely safe.*

- The vehicles we drive each pose inherent risks of their own. The list of safety improvements in our vehicles is impressive but there is still much work to be done. Smaller vehicles although they may be more economical or handle better than larger vehicles are at risk when colliding with a larger vehicle. Some larger vehicles have their own risks in their tendencies to roll over along with other built in design challenges. Again there is no completely risk free vehicle. *No vehicle is completely safe.*

- For drivers at risk the list of driver errors and risk behavior goes on and on –everything from excessive speed to simple inattention. Sometimes a particular age group can be identified but for all of us driver errors and risky behavior are things we must always be on guard against. Even the best driver may have a moment of inattention or make a wrong move that could have potentially fatal results. And again there is no completely risk free driver. *No driver is completely safe.*

In perspective…. Each year the number of people injured in crashes would fill three large stadiums. Think of three large baseball stadiums filled to overflowing with injured men, women and children.

- Understanding your risk, determining its source and developing ways of reducing the risk is the goal of crash data. It is a process that requires accurate data examined over a span of time that allows for a truly accurate picture of the risk potential for even small segments of roadways. Roadway risk reduction is like all big problems it is solved one roadway segment at a time.

- Good data is needed to first evaluate the risk, then determine the solution and then evaluate the results of applying the remedy. Only then can we move on to the next problem.

On average each year 873,800 persons are involved in motor vehicle crashes either as drivers, passengers or pedestrians out of an average population of an estimated nine million in Georgia. Everyone is at risk.

- Over the past seven years on average 368 people were injured in crashes each day compared with a daily average of 60 aggravated assaults.
- Motor vehicle crash fatalities out numbered murder victims almost three to one over the past seven years.
- On average 32 people were killed in crashes each week compared with 10 murders.

In perspective….

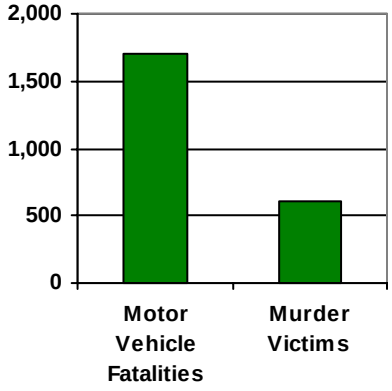
In 2006, 1,703 people were killed in crashes compared with 601 murders in Georgia.

In that single year 1,102 more people died in crashes than were murdered.

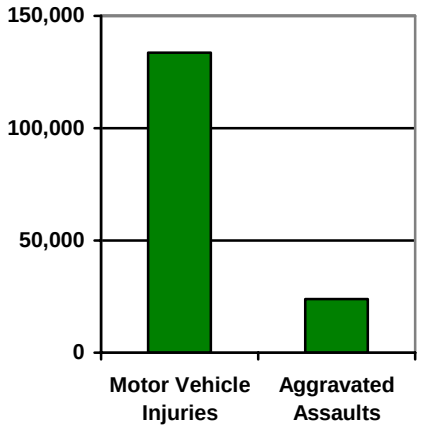
133,555 people were injured in crashes compared with 23,867 incidents of aggravated assault.

In that single year 109,688 more people were injured in crashes than by aggravated assaults.

2006 Motor Vehicle Fatalities Compared with Murder Victims



2006 Motor Vehicle Injuries Compared with Aggravated Assaults



Crime versus Crashes

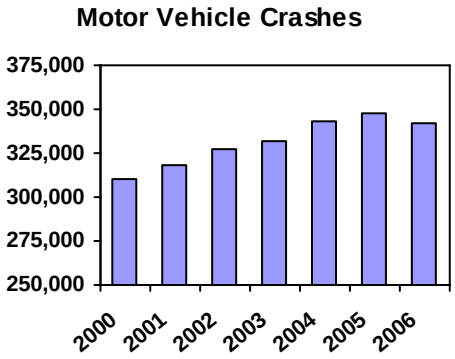
	2000	2001	2002	2003	2004	2005	2006	2000-2006
Murdered Victims	496	549	521	619	476	526	601	3,788
Crash Fatalities	1,549	1,656	1,531	1,610	1,641	1,745	1,703	11,435
Aggravated Assaults*	21,463	22,930	21,109	20,912	20,823	22,409	23,867	153,513
Crash Injuries	130,608	132,305	132,623	132,879	138,130	139,194	133,555	939,294

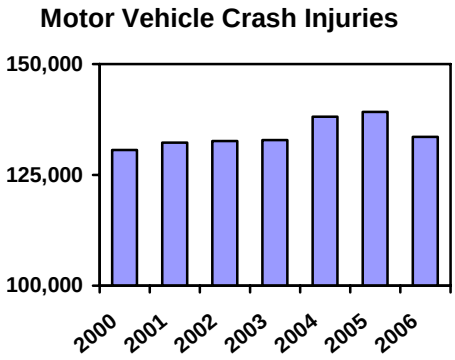
*Aggravated assaults may or may not involve an actual physical injury to a victim.

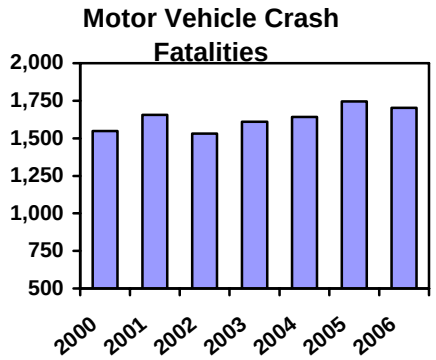
Data Sources: Georgia Department of Transportation, crime data from Georgia Bureau of Investigation

In 2006 alone 1,703 men, women and children lost their lives on Georgia's roadways. Almost five people died every day on average – more than 32 deaths each week. Fatalities have increased from around 1,500 each year in the 90's to over 1,700 in 2005 and 2006.

- From 2000 to 2005 motor vehicle crashes increased and then declined in 2006 –the first such decline in ten years.
- Although the number of injuries remained about the same from 2000 to 2003, they increased in 2004 and 2005 and then declined in 2006. The injury rate remained about the same due to the increase in risk exposure –a greater number of vehicle miles traveled. A declining rate indicates the relative risk has declined and does not mean that the risk of injury is still not significant.
- Multiple factors come into play when trying to understand crash data. More drivers and vehicles contribute to more crashes but protective behaviors such as seat belt use or motorcycle helmet use greatly reduce the number of people injured or killed. In addition, seat belts and helmets not only save lives they also reduce the chance of serious injury.
- Seat belts do not prevent crashes, they prevent injuries. In some cases the crash is so severe that no occupant protection device will prevent an injury.
- Preventing the crash itself is the most effective way of preventing injuries and fatalities.







Crashes, Injuries and Fatalities

Number and Rate per 100 Million Vehicle Miles Traveled

	2000	2001	2002	2003	2004	2005	2006	2000-2006
Crashes	309,768	317,851	327,774	331,612	342,922	348,061	342,534	2,320,522
Rate	299.5	297.6	316.9	306.1	306.3	312.4	307.9	306.7
Injuries	130,608	132,305	132,623	132,879	138,130	139,194	133,555	939,294
Rate	126.3	123.9	128.2	122.7	123.4	124.9	120.0	124.1
Fatalities	1,549	1,656	1,531	1,610	1,641	1,745	1,703	11,435
Rate	1.50	1.55	1.48	1.49	1.47	1.57	1.53	1.51

From 2000 to 2006, 42,337 people received severe incapacitating injuries such as traumatic head injuries, paralysis, or other serious injuries. Motor vehicle crashes are the leading cause of traumatic head injuries, injuries that often result in death or decades of slow and incomplete recovery.

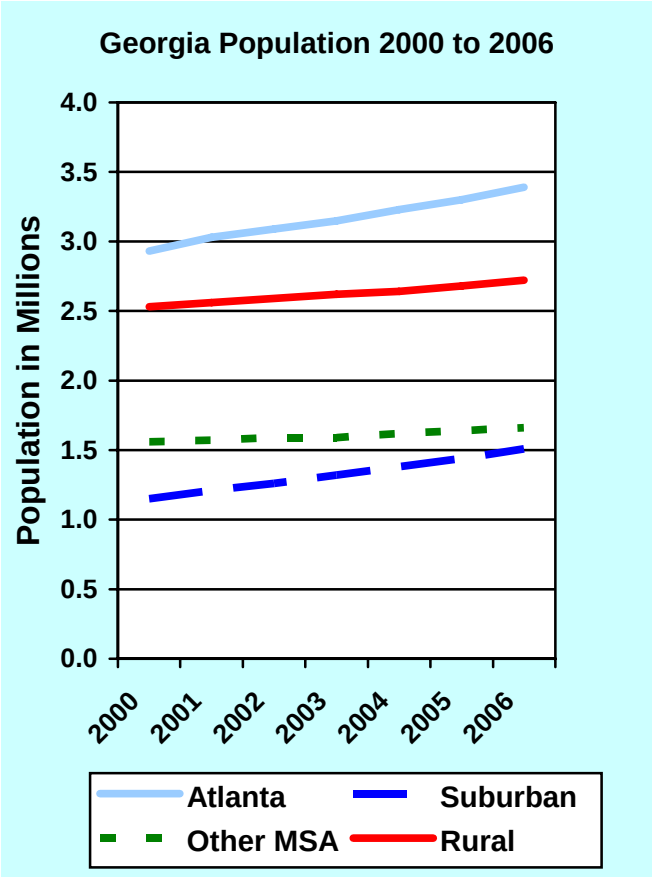
- On average each week 116 people were seriously injured and 31 killed.
- Minor and moderate injuries such as minor cuts or sprains far outnumber serious or fatal injuries – 1,844 minor injuries and 621 moderate injuries on average each week.
- Crashes resulting in serious injury or death increased from 2000 to 2006. The number of serious injuries such as coma or paralysis increased 11.1 percent –637 more serious injuries in 2006 than in 2000.
- Emergency medical services are essential when dealing with injuries and absolutely imperative if the crash victim is seriously injured. Medical care at the scene can reduce the risk impact of a serious injury and in life threatening injuries has saved lives at the crash scene.
- The increase in serious injuries parallels the increase in fatalities because the factors associated with fatal crashes are often also associated with factors that cause serious injury crashes.

Motor Vehicle Crash Injuries
Number and Rate per 10,000 Population

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Minor Injuries	92,974	94,499	95,062	95,069	98,559	99,492	95,339	2.54
Rate	113.0	112.2	110.6	108.6	110.3	108.9	101.8	-9.87
Moderate Injuries	31,882	31,873	31,832	31,960	33,252	33,337	31,827	-0.17
Rate	38.7	37.8	37.0	36.5	37.2	36.5	34.0	-12.26
Serious Injuries	5,752	5,933	5,729	5,850	6,319	6,365	6,389	11.07
Rate	7.0	7.0	6.7	6.7	7.1	7.0	6.8	-2.37
Total Injuries	130,608	132,305	132,623	132,879	138,130	139,194	133,555	2.26
Rate	158.7	157.1	154.2	151.9	156.4	152.4	142.6	-10.12
Fatalities	1,549	1,656	1,531	1,610	1,641	1,745	1,703	9.94
Rate	1.88	1.97	1.78	1.84	1.84	1.91	1.82	-3.37

Georgia's exploding population growth has had profound effects on the crash risks on our roads and highways. Increased volumes of drivers, cars and travel lead to congested roadways, which increase the risk of crashes. In turn, because of the increased congestion speeds tend to be slower leading to fewer or less severe injury crashes.

- The increase in population has not been even throughout the state. Some areas have seen exponential growth while others have seen only small gains. This disparity has an effect on motor vehicle crashes in many ways.
- The population in the suburban Atlanta counties increased 31.5 percent from 2000 to 2006 compared with an increase of only 6.53 percent in metropolitan counties outside of Atlanta and 7.57 percent in rural counties.
- Moderate growth occurred in Clayton, Cobb, DeKalb, Fulton and Gwinnett counties, the five Atlanta metropolitan counties – 15.63 percent from 2000 to 2006.



Data Source: U.S. Census Bureau (see next page)

In Perspective….

Another aspect of the increased vehicle miles traveled and population is that although the number of crashes or injuries may increase the rates may decline. In order to compare the number of crashes from one year to the next or from one county to another we need a measure of the exposure to risk. The amount of travel or the vehicle miles traveled gives us one measurement of risk.

The rate is a measurement of exposure -in simplest terms the more you travel the greater your risk of having a crash. By taking the exposure into account we can compare one county to another or trends over time. The rate is calculated by dividing the crashes or injuries by vehicle miles driven or population. The resulting rate is a measure of the degree of risk in a county or on a type of roadway.

This should be a measurement of risk of being in a crash. But rates can be misleading. If a high risk road with a high number of fatalities has a fatality rate that is declining it does not necessarily mean that it is a safer road. It may only mean that because of all the increased traffic the relative risk is lower for all possible motorists. The road may still be high risk.

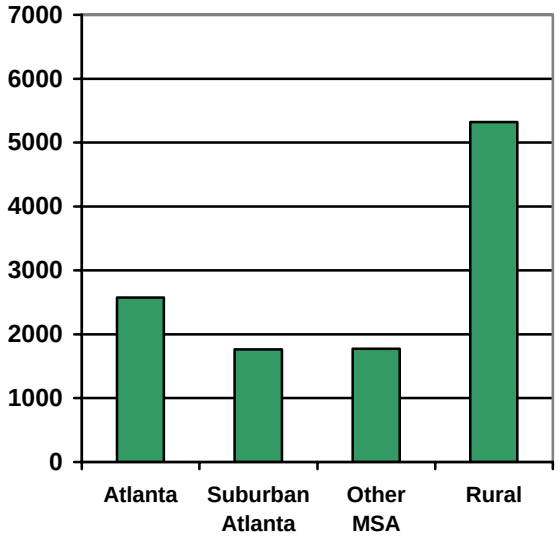
Even though more crashes occur in the five Atlanta metropolitan counties more people die in rural counties.

The number of people killed in rural Georgia counties is almost double those killed in the five metropolitan Atlanta counties. In comparison, the number of crashes in the five Atlanta counties is almost double the number of crashes in Georgia' rural counties.

Atlanta suburban counties have seen an increase in crashes but a decrease in fatalities. Increased population and congestion leads to more crashes but bumper to bumper traffic leads to slower speeds which reduce the severity of injury.

The opposite is true of the other MSA counties that show a decline in crashes but an increase in fatalities.

Total Fatalities by Region, 2000-2006



Crashes Injuries and Fatalities by Region* 2000 to 2006

Number and Rate per 100 Million Vehicle Miles Traveled

	2000		2006		Percent Change in	Percent Change in
	Number	Rate	Number	Rate	Number	Rate
Crashes						
Atlanta	135,988	402.3	151,193	433.0	11.18	7.65
Atlanta Suburban	41,005	274.9	51,766	284.9	26.24	3.65
Other MSA	53,763	336.2	56,905	333.9	5.84	-0.71
Rural Counties	79,012	204.1	82,670	201.0	4.63	-1.52
Injuries						
Atlanta	49,524	146.5	49,939	143.0	0.84	-2.37
Atlanta Suburban	18,115	121.5	21,314	117.3	17.66	-3.40
Other MSA	23,187	145.0	22,632	132.8	-2.39	-8.44
Rural Counties	39,782	102.8	39,670	96.4	-0.28	-6.14
Fatalities						
Atlanta	369	1.09	398	1.14	7.86	4.43
Atlanta Suburban	235	1.58	267	1.47	13.62	-6.72
Other MSA	244	1.53	281	1.65	15.16	8.03
Rural Counties	701	1.81	757	1.84	7.99	1.64

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

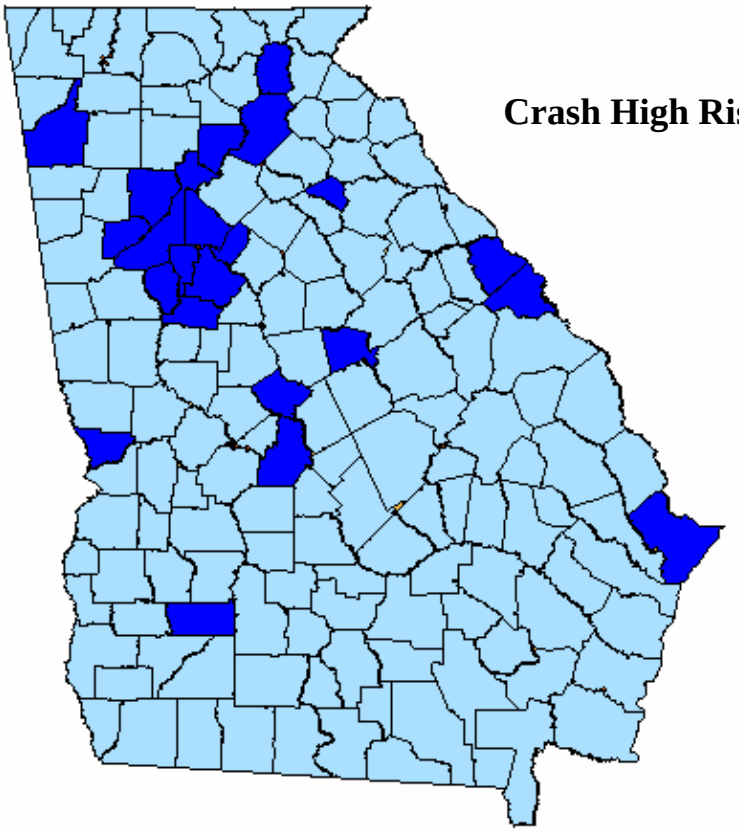
Data Source: U.S. Census Bureau

Congestion and high numbers of vehicles and drivers combine to increase the risk of crashes and at the same time can reduce the severity of a crash due to lower speeds and other factors associated with fatal crashes.

Congestion also can interfere with the ability of emergency vehicles getting to the crash scene to provide life saving aid thus increasing the risk of crash victims dying.

Modern road design contributes to fewer fatal crashes because of medians or barriers, clear signs, wide solid shoulders and well-planned traffic control devices. These road characteristics assure that in the event of loss of control of the vehicle, the vehicle does not go into oncoming traffic or off the road into a fixed object.

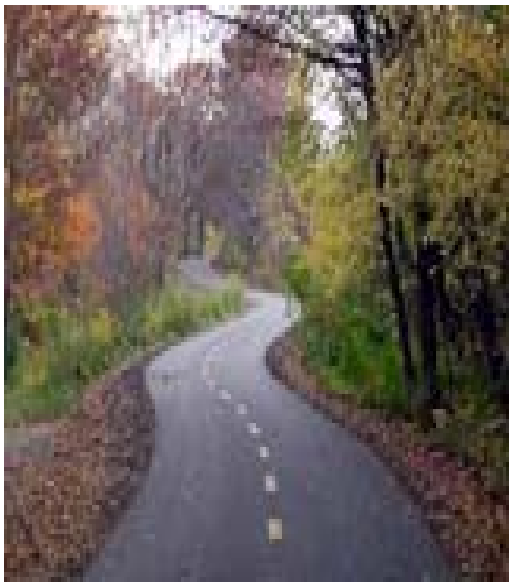
Crash High Risk Counties



2000-2006 Crash Rate per 100 Million VMT

Counties with a crash rate higher than the state crash rate are in dark blue. The counties in dark blue have the highest risk of being in a crash.

Compare it to the fatality high-risk counties on the next page.



Two-way roads without a physical barrier or separation predominate in rural areas. These roads have the highest fatal crash risk.

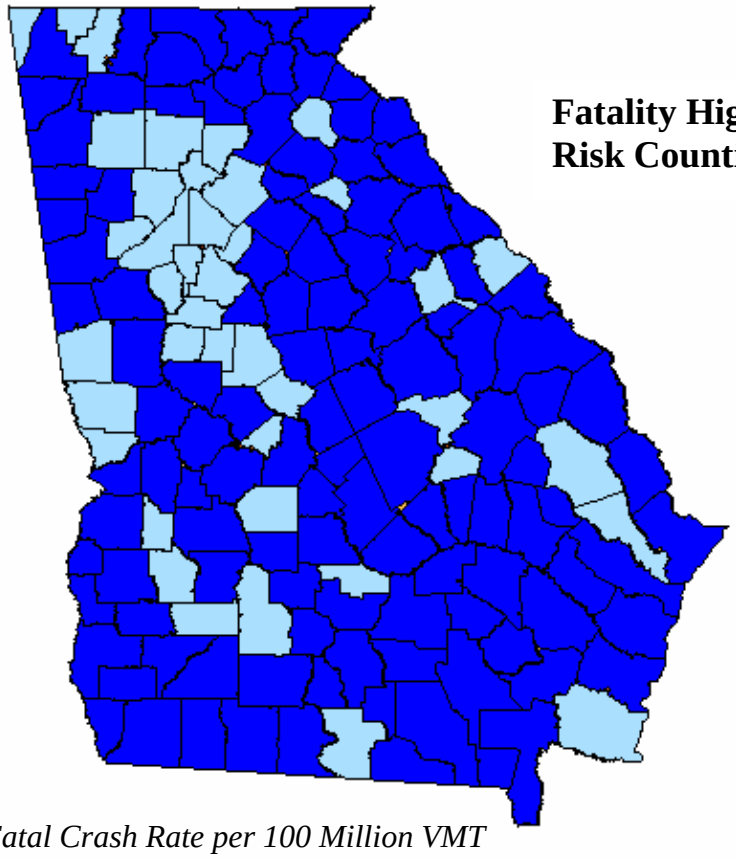
Two-way roads are often narrow roads with no physical barrier or division separating oncoming traffic, sharp curves, limited visibility, little or no shoulder, and with frequent entering and exiting traffic. This greatly increases the risk of a crash.

These characteristics also present a risk for emergency vehicles traveling at the high speeds necessary for immediate response. This combined with the lack of trauma centers in many rural areas further increases the risk of dying for the seriously injured.

These roadways are also a problem in emerging suburbs that often are not prepared for massive increases in population with their limited funding resources and infrastructure.

Counties with a fatality rate higher than the state fatality rate are in dark blue. In other words the highest risk of being killed in a crash is in the counties in dark blue.

The fatality map on the right is almost a mirror image of the crash high-risk counties.



2000-2006 Fatal Crash Rate per 100 Million VMT

Risk and the Roads…..
Section II

***C*rash *A*nalysis, *S*tatistics & *I*nformation**

Georgia Department of Transportation **January 2008**

This section will cover both the roadways and the crashes because crash risk cannot be separated from the characteristics of the roadway. Certain types of roadway have a much higher risk due to very basic features such as two-way roads with nothing to separate oncoming traffic or curved roadways that sometimes are difficult to negotiate. It will also cover effective road engineering treatments that reduce the risk of crashing.

Connections…..

The Crash Report

'Crash occurred on two-way road divided by a single dotted center line.
Vehicle traveling north failed to negotiate the curve and when the rear tire left the pavement it dug into deep ruts in the soft dirt and driver lost control of the vehicle.
Vehicle out of control left the roadway and struck a tree.
Vehicle came to rest wrapped around tree.
Vehicle doors jammed, Rescue and EMS arrived and extricated driver but driver had not survived his injuries'
-Crash Report

Crash report narrative is taken from crash reports by Georgia law enforcement officers. Photographs are purely for descriptive purposes and are not from the crash scene.

From 2000 to 2006 rollover crashes increased 29.7 percent in Georgia. In rollover crashes where someone was fatally injured the increase was even greater, 41.2 percent from 2000 to 2006.

- Critical to crash analysis is the determination of how the crash occurred. Identifying the first harmful event and the severity of the crash based on injuries links how the crash occurred to the level of risk to drivers and passengers.
- From 2000 to 2006 crashes in which the first harmful event was collision with another moving vehicle accounted for 76.9 percent of total crashes but in comparison only 46.3 percent of the fatal crashes involved a collision with another vehicle.
- Overturn crashes accounted for just one out of 100 of all crashes, in comparison they were one out of ten of the fatal crashes.
- Crashes into fixed objects accounted for 12.6 percent of all crashes but 27.4 percent of all fatal crashes. From 2000 to 2006 fixed object crashes increased 4.2 percent in comparison during the same time fatal fixed object crashes increased 11.3 percent.

Type of Crash

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Crashes								
Moving Vehicle Collision	238,100	246,035	252,978	255,197	263,547	267,363	264,064	10.90
Fixed Object Crash	39,255	37,907	41,658	41,681	43,020	44,053	40,917	4.23
Overturn Crash	4,986	4,919	4,963	4,692	5,478	5,637	6,467	29.70
Total	309,768	317,851	327,774	331,612	342,922	348,061	342,534	10.58
Non-Fatal Injury Crashes								
Moving Vehicle Collision	62,252	64,319	64,243	64,811	66,925	67,376	64,547	3.69
Fixed Object Crash	13,677	13,107	14,153	13,915	14,541	14,956	14,103	3.11
Overturn Crash	2,830	2,789	2,816	2,843	3,364	3,441	3,737	32.05
Total	83,675	85,470	86,081	86,526	89,983	91,177	87,851	4.99
Fatal Crashes								
Moving Vehicle Collision	604	685	604	646	679	702	656	8.61
Fixed Object Crash	469	442	415	470	402	539	522	11.30
Overturn Crash	114	129	139	120	154	137	161	41.23
Total	1,385	1,475	1,369	1,469	1,467	1,595	1,562	12.78

*Data for other crash types not presented.

**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

Overturn and fixed object crashes pose the highest risk of injury or death to the vehicle occupants. In rollover crashes half of the occupants were either killed or injured. In fixed object crashes one out of three people were injured or killed.

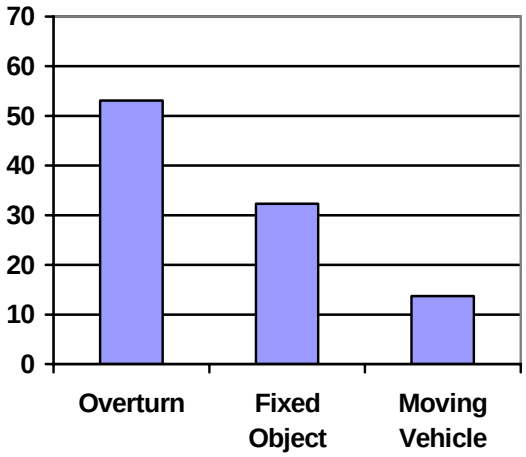
In comparison in crashes involving another vehicle one out of 10 occupants were killed or injured.

- Rollover or fixed object single vehicle crashes accounted for four out of ten of the fatalities that occurred in 2006. In comparison only about 15 percent of all crashes involved rollover or fixed object single vehicle crashes.

- The type of crash can predict your risk for injury or death. Rollover crashes result in more injuries and fatalities due to the extensive vehicle damage and perhaps more importantly the risk for unrestrained occupants to be ejected from the vehicle. In 2006 of the 10,215 vehicle occupants in overturn crashes 5,424 were either injured or killed.

- In fixed object crashes, depending on the force of impact, the crash often results in the occupants being ejected from the vehicle if they have failed to use seat belts. In 2006 of the 57,897 vehicle occupants in fixed object crashes 18,723 were either injured or killed.

Severity of Injury, 2006
Percent of Persons in Crash Injured or Killed



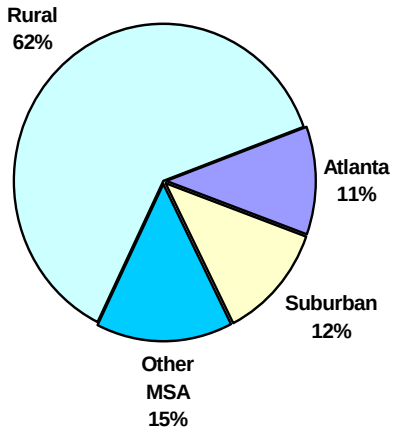
Severity of Injury, 2006
Percent of Persons in Crash Injured or Killed

	Occupants	Injuries & Fatalities	Percent Injured or Killed
Moving Vehicle	762,810	104,305	13.67
Fixed Object	57,897	18,723	32.34
Overturn	10,215	5,424	53.10

Regardless of the type of crash, rural counties have more fatalities than urban areas. Rural counties accounted for 41.9 percent of the fatal crashes involving another vehicle, 49.6 percent of the fatal fixed object crashes and 62.2 percent of the fatal rollover crashes although they accounted for only 37 percent of the vehicle travel in the state.

- From 2000 to 2006, 49.6 percent of the fatal fixed object crashes occurred in rural counties, compared with 18.2 percent in the five major Atlanta metropolitan counties.
- The disparity was even greater for overturn crashes, 62.2 percent occurred in rural counties compared with 11.1 percent occurring in the five Atlanta metropolitan counties.

Rollover Fatal Crashes by Region, 2000-2006



Crash Type by Region, 2000-2006

	Moving Vehicle		Fixed Object		Overturn	
	Number	Percent	Number	Percent	Number	Percent
Crashes						
Atlanta	874,999	49.0	84,266	29.2	6,784	18.3
Atlanta Suburban	236,468	13.2	49,630	17.2	6,281	16.9
Other MSA	345,400	19.3	55,679	19.3	5,802	15.6
Rural Counties	330,417	18.5	98,916	34.3	18,275	49.2
Georgia	1,787,284	100.0	288,491	100.0	37,142	100.0
Nonfatal Injury Crashes						
Atlanta	296,224	45.9	32,605	25.8	3,837	16.2
Atlanta Suburban	88,823	13.8	21,998	17.4	4,005	16.9
Other MSA	127,395	19.8	23,005	18.2	3,622	15.3
Rural Counties	132,417	20.5	48,610	38.5	12,205	51.6
Georgia	644,859	100.0	126,218	100.0	23,669	100.0
Fatal Crashes						
Atlanta	1,101	24.1	593	18.2	106	11.1
Atlanta Suburban	805	17.6	516	15.8	114	11.9
Other MSA	754	16.5	534	16.4	141	14.8
Rural Counties	1,916	41.9	1,616	49.6	593	62.2
Georgia	4,576	100.0	3,259	100.0	954	100.0

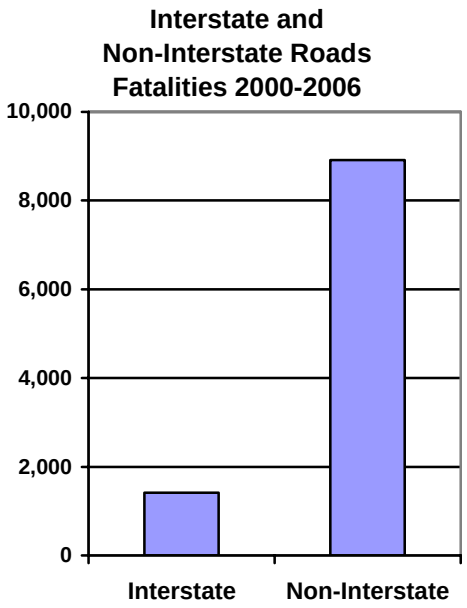
*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

Data Source: U.S. Census Bureau

**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

The majority of all crashes occur on non-interstate roads. Almost nine out of ten crashes occur on non-interstate roads. In addition, non-interstate roads pose a higher risk of death or injury than interstate roads.

- Compared with interstates non-interstate roads are often not as well engineered and often have frequent entering and exiting traffic which greatly increases the risk of a crash.
- Non-interstate roads are also higher risk for serious injuries than interstates. In 2006, there were 5,626 serious injuries in crashes on non-interstate roads compared with 763 serious injuries in crashes on interstate roads.
- After steadily increasing from 2000 to 2005 the number of crashes on interstates, state routes and county roads declined in 2006.
- The number of fatal crashes on state routes increased from 2002 to 2006. From 2000 to 2006, an average of 24 fatalities occurred on non-interstate roads each week, compared with an average of 4 fatalities each week on interstates.



Interstate and Non-Interstate Roads

	2000	2001	2002	2003	2004	2005	2006	2000-2006	Percent
Crashes									
Interstate	34,024	35,995	37,106	37,503	39,167	40,068	38,792	262,655	11.32
State Route	96,157	98,152	103,930	103,685	108,498	109,573	105,927	725,922	31.28
County Route	85,024	90,204	95,407	99,802	104,472	106,210	105,152	686,271	29.57
City Street	94,563	93,500	91,331	90,622	90,785	92,210	92,663	645,674	27.82
Total	309,768	317,851	327,774	331,612	342,922	348,061	342,534	2,320,522	100.00
Non-Fatal Injury Crashes									
Interstate	8,980	9,583	9,257	9,248	9,622	9,969	9,428	66,087	10.82
State Route	29,178	29,615	30,767	30,731	32,320	32,354	30,935	215,900	35.35
County Route	22,787	24,056	24,870	25,363	26,761	27,495	26,568	177,900	29.13
City Street	22,730	22,216	21,187	21,184	21,280	21,359	20,920	150,876	24.70
Total	83,675	85,470	86,081	86,526	89,983	91,177	87,851	610,763	100.00
Fatal Crashes									
Interstate	192	210	173	196	213	220	209	1,413	13.69
State Route	624	684	635	660	668	697	705	4,673	45.27
County Route	413	418	426	457	434	523	482	3,153	30.55
City Street	156	163	135	156	152	155	166	1,083	10.49
Total	1,385	1,475	1,369	1,469	1,467	1,595	1,562	10,322	100.00

The majority of fixed object crashes occur on state and county routes. This is also true for overturn crashes.

Three out of four fatal crashes occurred on state or county routes regardless of the crash type.

Only one out of ten fatal fixed object crashes occurred on interstate roads.

- Seventy-nine percent of the fatal fixed object crashes occurred on state or county routes. For overturn crashes, 74.7 percent of the fatal crashes happened on state or county routes.

- The same pattern is true for injury crashes. For fixed object injury crashes 71.9 percent happened on state or county roads. For overturn crashes resulting in an injury 76.4 percent occurred on state or county roads.

Risk in Perspective:

Exposure to risk can be presented in many ways. The amount of travel is one of the best ways to measure risk

Only 28 percent of travel in Georgia occurs on county routes but almost half of the fatal fixed object crashes are on county roads.
In comparison, only 12 percent of the fixed object crashes occurred on interstates although interstates accounted for 27 percent of the travel.

Interstate and Non-Interstate Roads by Crash Type
2000-2006

	Moving Vehicle		Fixed Object		Overturn	
	Number	Percent	Number	Percent	Number	Percent
Crashes						
Interstate	194,374	10.9	43,466	15.1	5,477	14.7
State Route	586,386	32.8	70,511	24.4	12,486	33.6
County Route	474,705	26.6	123,115	42.7	15,662	42.2
City Street	531,819	29.8	51,399	17.8	3,517	9.5
Georgia	1,787,284	100.0	288,491	100.0	37,142	100.0
Nonfatal Injury Crashes						
Interstate	44,993	9.9	14,527	14.8	3,423	15.7
State Route	171,802	37.8	27,173	27.6	7,704	35.3
County Route	113,822	25.0	43,662	44.3	9,034	41.4
City Street	123,856	27.3	13,090	13.3	1,659	7.6
Georgia	454,473	100.0	98,452	100.0	21,820	100.0
Fatal Crashes						
Interstate	609	13.3	376	11.5	214	22.4
State Route	2,620	57.3	1,092	33.5	343	36.0
County Route	914	20.0	1,491	45.8	369	38.7
City Street	433	9.5	300	9.2	28	2.9
Georgia	4,576	100.0	3,259	100.0	954	100.0

*Data for other crash types not presented.

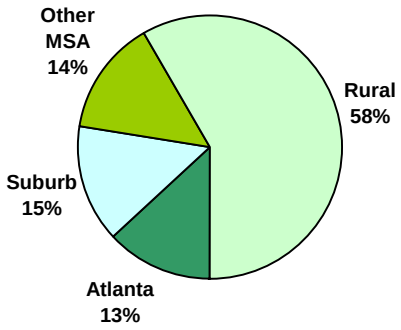
**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

From 2000 to 2006 altogether 42.2 percent of all fatal crashes on county routes occurred in rural counties. On state routes the proportion is even higher, 52.6 percent of the fatal crashes on state routes happened in rural counties.

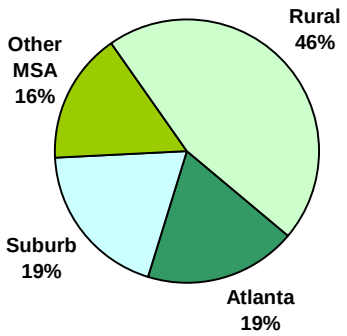
- For interstates, state routes and county routes the highest number of fatal crashes occurred in rural counties. Only on city streets were fatal crashes higher in the five Atlanta metropolitan counties.
- In 2006 fixed object crashes on state routes 58 percent of the fatal crashes occurred in rural counties –more than half of the fatal fixed object crashes. In comparison only 13 percent of the fatal fixed object crashes on state routes happened in the five Atlanta metropolitan counties.
- Rural county routes were also over represented in fatal fixed object crashes. Rural counties accounted for 46 percent of the fatal fixed object crashes on county routes –almost half of all fatal fixed object crashes on county roads.
- In contrast fixed object crashes on county routes in the Atlanta metropolitan counties only accounted for 19 percent of the fatal crashes.
- The number of fatal crashes on state routes in rural counties was more than three times higher than the number of fatal crashes on state routes in the five Atlanta metropolitan counties.

Fixed Object Fatal Crashes

On State Routes by Region, 2000-2006



On County Routes by Region, 2000-2006



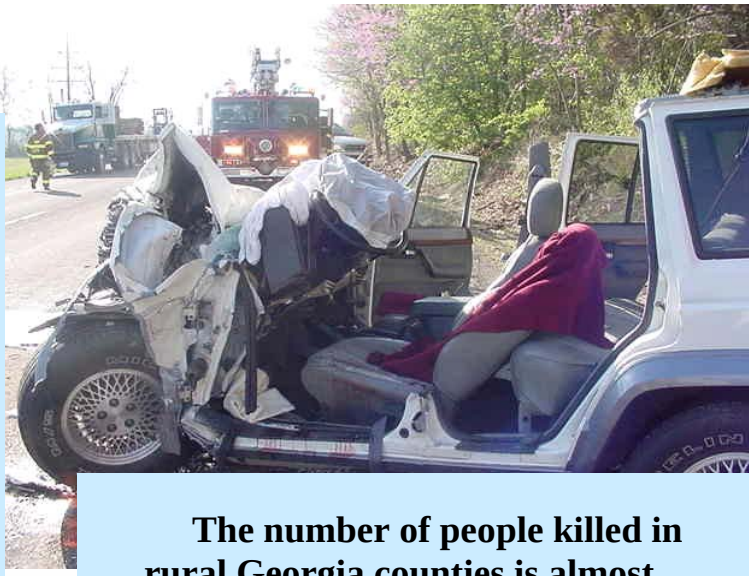
Fatal Crashes by Road Type and Region, 2000-2006
Number of Fatal Crashes and Percent of Total

	Interstate		State Route		County Route		City Street	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Atlanta	479	33.9	733	15.7	786	24.9	357	33.0
Suburban Atlanta	206	14.6	750	16.0	565	17.9	86	7.9
Other MSA	228	16.1	731	15.6	472	15.0	318	29.4
Rural	500	35.4	2,459	52.6	1,330	42.2	322	29.7
Georgia	1,413	100.0	4,673	100.0	3,153	100.0	1,083	100.0

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

High Risk Roads Special Report

This special section on high risk roads will focus on the characteristics that make a road high risk and the road engineering improvements that can be done to reduce the risk.



In the last seven years 11,435 people have died in motor vehicle crashes in Georgia.

Since 2000, over six million people have been involved in a motor vehicle crash in Georgia either as a driver or passenger or pedestrian. That is an average of 2,394 people each day.

In 2006, there were 5,626 serious injuries in crashes on non-interstate roads compared with 763 serious injuries in crashes on interstate roads.

The number of people killed in rural Georgia counties is almost double the number of people killed in the five metropolitan Atlanta counties.

Three out of four fatal crashes occurred on state or county routes regardless of the crash type.

Overturn and fixed object crashes pose the highest risk of injury or death to the vehicle occupants. In rollover crashes half of the occupants were either killed or injured. In fixed object crashes one out of three people were injured or killed.

On average, every Georgian will be involved in a crash every ten years. For a family of four this means that one of them will be involved in a crash every two and one-half years.

Why?
What contributes to the crash risk?
What makes certain roads high risk?
What specific road characteristics contribute to the higher risk?

In order to understand why certain roads are higher risk than others we need to examine the road characteristics and how the crash occurred.

To really understand the road characteristics that contribute to crash risk we need more detailed information on the roadway and many of these roadway elements are not captured on the current motor vehicle crash report. In order to access this information we merged the crash database with another Georgia Department of Transportation file the Location File. The Location File is a separate file that is used to verify the crash location given by the law enforcement office and contains extensive detailed information on the road.

Every effort is made to verify the location for each of the over 300,000 Georgia motor vehicle crashes each year although in some cases it is not possible. Throughout special report we utilized this linked crash data when needed and since not all crashes were able to be located there will be a difference in some of the data analyzed. When this linked data is used it will be identified as 'Crash-location linked data' to avoid confusion with the original crash database.

What we know:
State and county roads have the highest number of injuries and fatalities and are predominately two-way roads.

What can be done?
Once we know the specific road characteristics that increase crash risk we can then apply the right road improvements that reduce the risk of crashing.

Two-way roads with no physical separation or barrier are your highest risk roads. All in all these roads account for 73 percent of all fatal crashes in Georgia.

High Risk Roads are best described as two-way roads with no separation or barrier. The risk of a crash being fatal increases because often there is just no safe place to go – no shoulder or clear zone without posts or trees. The only choices are head into oncoming traffic or into a tree.

For many narrow roads the edges of the road are easy to slip off of and the road edge drop off is very deep causing loss of control when vehicles try to return to the roadway and the vehicle swerves either into oncoming traffic or off the road into a post or tree. These roads also have frequent entering and exiting vehicle traffic and limited access control that leads to collisions. The striping can be worn and difficult to see increasing the risk for any crash when visibility may be at issue. Add to these engineering risks the high risk driver, either inexperienced or older facing physical challenges, and the risk is compounded. Once a crash has occurred the same high risk roads impede the ability of emergency workers to provide aid and carry the seriously injured to treatment.

Factors that increase risk:

- no road separation or barrier
- narrow lanes and shoulders
- sharp curves
- no or inadequate access control
- poor/faded striping
- inadequate lighting
- crumbling shoulders
- sharp pavement drop-offs
- dense vegetation obscuring vision along roadsides
- poor signage

Economics plays a role here because city and county governments often do not have the resources to build and maintain roadways that pose minimum risk. This is especially a factor in expanding suburban and exurban areas that have primarily two-way roads with a rapidly increasing population. These communities have limited infrastructure and budgets and are often faced with demands that exceed their resources. Difficult choices must be made.

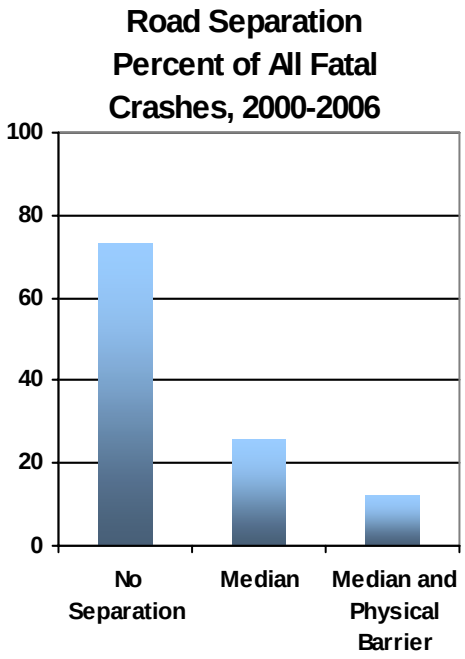
Rural communities are faced with even greater challenges. In many rural areas roads were built years ago without the benefit of modern engineering on what were essentially local cow trails. Add to that the infrastructure constraints that exist in small rural communities the challenge is to put limited resources where they will do the most good. Good crash data is the solution.

Three out of four fatal crashes occurred on two-way roads with no separation. They are the highest risk roadways.

How traffic is separated is a key factor in crash risk –the greater the separation the lower the crash risk. It also greatly affects the type of crash and the manner of collision.

From 2000 to 2006, two-way roads without a separation accounted for 69.6 percent of all injury crashes and 73.1 percent of all fatal crashes.

Fatal crashes on two-way roads with a median separating traffic accounted for one-fourth of all fatal crashes. For two-way roads with a median that also have an additional physical barrier the number of fatal crashes were fewer, 12.6 percent of all fatal crashes were on roads with a barrier.



Traffic Separation*
Number and Percent of Total Crashes

	2000	2001	2002	2003	2004	2005	2006	2000-2006	Percent
Two-way Without Separation									
Crashes	194,782	199,407	200,172	204,051	209,738	210,987	208,041	1,427,178	67.6
Injury Crashes	54,298	55,019	54,958	55,490	57,566	57,814	55,926	391,071	69.6
Fatal Crashes	936	1,006	909	1,030	1,002	1,069	1,084	7,036	73.1
Two-way with Median									
Crashes	80,773	84,953	87,695	91,181	95,046	98,101	97,647	635,396	30.1
Injury Crashes	21,369	22,416	22,136	22,902	23,847	24,553	23,817	161,040	28.7
Fatal Crashes	348	380	261	332	369	418	362	2,470	25.7
Two-way with Median and Additional Physical Barrier									
Crashes	58,713	61,422	62,934	65,439	68,085	70,065	69,662	456,320	21.6
Injury Crashes	14,910	15,610	15,170	15,768	16,370	16,826	16,341	110,995	19.8
Fatal Crashes	174	183	122	169	176	200	192	1,216	12.6
Total Crashes									
Crashes	282,158	291,285	294,508	301,668	311,592	316,409	313,121	2,110,741	-----
Injury Crashes	77,004	78,835	78,434	79,679	82,836	83,876	81,193	561,857	-----
Fatal Crashes	1,291	1,395	1,179	1,389	1,380	1,499	1,489	9,622	-----

*Crash location linked data

**Percent of total crashes does not add up to 100 due to overlap between roads with median and also a barrier.

**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

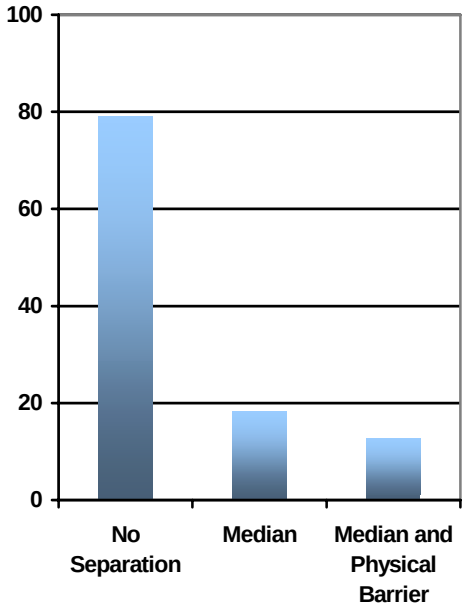
Off road fatal crashes accounted for 41 percent of all fatal crashes in Georgia in 2006. Of the 613 off road fatal crashes on two way roads 485 occurred on roads without any separation.

Run off the road crashes are always high risk. The high number of overturn or fixed object crashes in road departure crashes is a significant factor in the high risk.

For all crashes in Georgia fixed object crashes accounted for 12.6 percent of all crashes but they accounted for 27.4 percent of the fatal crashes. For off road the proportion was dramatically greater -78 percent of the off road crashes were fixed object.

The greater the separation the lower the risk. Two-way roads without a separation accounted for 485 fatal crashes. In comparison 112 fatal crashes happened on two-way roads with a median and 60 fatal crashes occurred on two-way roads with both a median and physical barrier.

Fatal Off Road Crashes by Road Separation, 2006
Percent of Fatal Crashes



Off Road Crashes by Road Separation, 2006
Number and Percent of All Road Crashes

	All Roads	Without Separation		With Median		With Median & Barrier	
	Number	Number	Percent	Number	Percent	Number	Percent
Crashes							
On Road	266,130	174,621	65.6	84,838	31.9	61,961	23.3
Off Road	46,991	33,420	71.1	12,809	27.3	7,701	16.4
Total	313,121	208,041	66.4	97,647	31.2	69,662	22.2
Injury Crashes							
On Road	64,530	43,377	67.2	19,904	30.8	14,130	21.9
Off Road	16,663	12,549	75.3	3,913	23.5	2,211	13.3
Total	81,193	55,926	68.9	23,817	29.3	16,341	20.1
Fatal Crashes							
On Road	876	599	68.4	250	28.5	132	15.1
Off Road	613	485	79.1	112	18.3	60	9.8
Total	1,489	1,084	72.8	362	24.3	192	12.9

Crash location linked data

*Percent of total crashes does not add up to 100 due to overlap between roads with median and also a barrier.

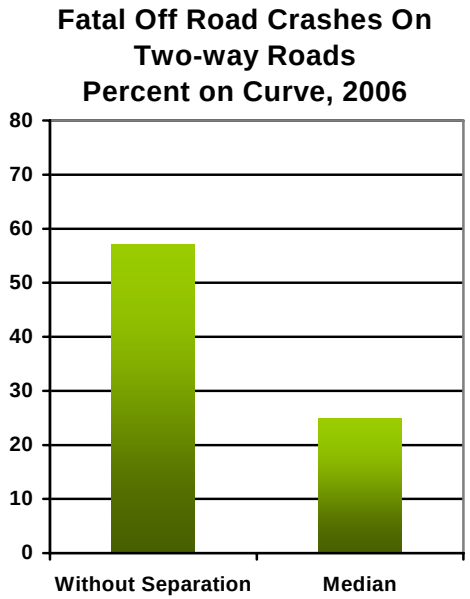
Horizontal curves are one of the major road characteristics that increase the risk of crashing. Of the 485 fatal off road crashes on two-way roads without any separation 277 occurred on a curve.

One out of two fatal off road crashes happened on a curve although straight roadways segments far outnumber curved roadway segments.

Separating traffic reduces the risk. For off road fatal crashes on two-way roads without a separation 57.1 percent of the fatal crashes were on a curve. In comparison on two-way roads with a median, only 25.0 percent occurred on a curve.

For on road fatal crashes, one out of five fatal crashes on two-way roads without a separation happened on a curve. In comparison, for roads with a median, only one out of ten on road crashes was on a curve.

Of the 313,121 total crashes in 2006 in Georgia, 10.1 percent were on a curve but 31.7 percent of total fatal crashes were on a curve. Curved roadway segments pose a risk regardless of roads separation.



Off Road Crashes On A Curve By Traffic Separation, 2006
Number and Percent on Curve

	Without Separation			With Median			With Median & Barrier		
	Crashes	On Curve	Percent	Crashes	On Curve	Percent	Crashes	On Curve	Percent
Crashes									
On Road	174,621	11,491	6.6	84,838	4,134	4.9	61,961	2,866	4.6
Off Road	33,420	12,687	38.0	12,809	2,545	19.9	7,701	1,595	20.7
Total	208,041	24,178	11.6	97,647	6,679	6.8	69,662	4,461	6.4
Injury Crashes									
On Road	43,377	3,371	7.8	19,904	977	4.9	14,130	655	4.6
Off Road	12,549	5,650	45.0	3,913	777	19.9	2,211	448	20.3
Total	55,926	9,021	16.1	23,817	1,754	7.4	16,341	1,103	6.7
Fatal Crashes									
On Road	599	124	20.7	250	27	10.8	132	15	11.4
Off Road	485	277	57.1	112	28	25.0	60	18	30.0
Total	1,084	401	37.0	362	55	15.2	192	33	17.2

Crash-location linked data

**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

Many factors come into play to increase the crash risk on what may already be a high risk roadway. Poor light conditions can be a factor in all crashes and especially on high risk roadways. Of the 277 fatal off road crashes a curve on two-way roads without any separation 179 occurred at dawn, dusk or night.

When the road is already high risk any additional risk factors compound the chance of a crash being fatal.

There are many factors that increase crash risk. Rain or other weather conditions, vehicle or driver condition, vehicle speed and light conditions are just a few of the factors that can increase crash risk. One of the most critical is visibility.

Poor visibility increases the risk of a crash. In all cases, on straight or curve road segments of two-way roads without a separation, reduced visibility found at dawn, dusk and at night increased the risk of an off road crash. Four out of ten off road crashes and injury crashes occurred at dawn, dusk or at night. In fatal off road crashes on two-way roads the proportion of crashes happening at dawn, dusk or at night increased to six out of ten fatal crashes.

Light Conditions On High Risk Roads, 2006
Off road Crashes On Two-way Roads Without a Separation

	Total	Daylight	Not Daylight	Percent Not Daylight
Total Crashes				
Straight Roadway	20,733	11,898	8,835	42.6
On Curve	12,687	6,855	5,832	46.0
Total Off Road	33,420	18,753	14,667	43.9
Injury Crashes				
Straight Roadway	6,899	4,000	2,899	42.0
Curve	5,650	3,184	2,466	43.6
Total	12,549	7,184	5,365	42.8
Fatal Crashes				
Straight Roadway	208	117	91	43.8
Curve	277	98	179	64.6
Total	485	215	270	55.7

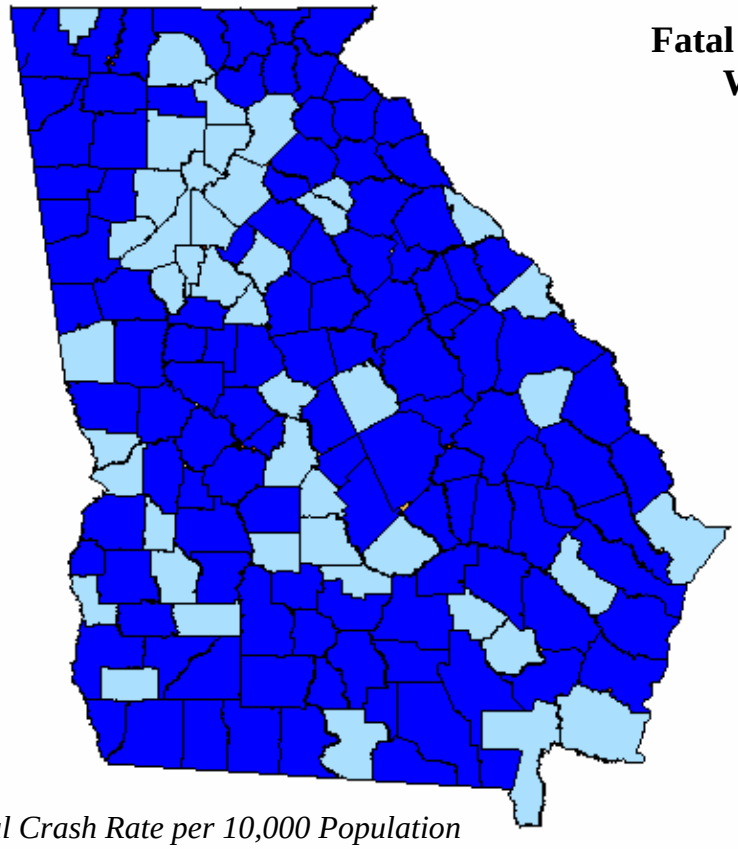
Crash-location linked data

Lighting & Road connection:

- inadequate lighting
- poor or faded striping
- poor signage
- no road separation or barrier
- narrow lanes
- sharp curves
- narrow shoulders
- poor shoulders
- sharp pavement drop-offs
- limited clear zones along roadsides

The majority of fatal crashes on two-way roads without any separation occur in rural counties. These counties have a higher fatal crash rate than for Georgia overall.

The high risk roads in these rural counties account for the majority of fatal crashes. The high risk can be best measured by applying some estimate of the exposure to risk. Here the number of fatal crashes is divided by the population in that county. This adjusts the crashes by the number of people at risk. By this measure most Georgia rural counties have far more fatal crashes than the more urban counties.



Fatal Crash Rate per 10,000 Population

Fatal Crashes on Two-way Roads Without Any Separation

Counties with a fatality rate higher than the state fatality rate are in dark blue. In other words the highest risk of being killed in a crash is in the counties in dark blue.

The majority of fatal crashes on two-way roads without any separation occur in rural counties.

One out of three fatal crashes in Georgia in 2006 occurred on off-system roads.

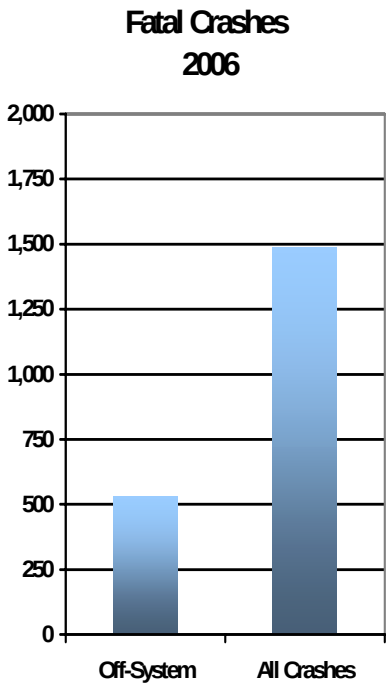
Off-system roads not only represent one-third of all fatal crashes they also represent one-third of all crashes in Georgia and one-third of the injury crashes. Taking only into account the economic cost of these crashes, any improvement in crash reduction would prove beneficial.

Road ownership governs who is responsible for building and maintaining the roads and is a major factor in making road improvements. The Georgia Department of Transportation is responsible for on-system roads which includes state roads, interstates and a few other routes. Off-system roads are owned by local county and city municipalities.

Off-System Crashes, 2006

	Crashes		Injury Crashes		Fatal Crashes	
	Number	Percent	Number	Percent	Number	Percent
Off-System	120,104	38.4	30,252	37.3	531	35.7
On-System	193,017	61.6	50,941	62.7	958	64.3
Total	313,121	100.0	81,193	100.0	1,489	100.0

Crash-location linked data



All of the risk factors that apply to the two-way roads in the previous pages also apply to off-system roadways. Although risk reduction should not be based on money the reality is that reducing risk on our roads can be expensive. Even basic maintenance can be overwhelming for counties with little revenue which is why projects like GDOT's Off -System Program is so important. **The Off-System Program** of the Georgia Department of Transportation assists local counties with road improvements targeted to high risk roads. The overriding goal is to save lives first by reducing the risk of a crash and second reduce the risk of injury should a crash occur. **The following pages** will describe these high risk roads and the road improvements that are being implemented to begin to reduce the risk.

Risk is relative. Not all roads are created equal and although the public should have a reasonable expectation of minimal risk that is a relative term. Some roads by virtue of their basic characteristics pose a higher risk for crashes than other kinds of roads but there are road improvements that have been shown to reduce the number of crashes and reduce injuries and fatalities.

The key is to know which improvement to apply to reduce the risk on that specific road segment. The correct improvement is a proven effective treatment that specifically addresses the road defect or characteristic causing the increased risk.

Factors that increase risk:

- no road separation or barrier
- narrow lanes
- sharp curves
- narrow shoulders
- poor/faded striping
- inadequate lighting
- crumbling shoulders
- sharp pavement drop-offs
- limited clear zones along roadsides
- poor signage

Factors that decrease risk:

- road separation or barrier
- wide lanes
- controlled access
- modern roadway design
- wide solid shoulders
- clear pavement markings
- solid pavements
- good lighting
- gradual curves
- no severe pavement drop-offs
- no vegetation blocking visibility along roadsides
- clear, large signage
- grade reduction on slopes

The first goal is to prevent the crash. The second goal is to minimize the severity if one should occur.

Cost is a factor because many of the road safety improvements are expensive.

Where to focus effort is crucial in this process. Fatal injuries are the most critical concern followed by serious injuries and the sheer economical cost of crashes. In order to identify high risk road segments Georgia needs GPS in all vehicles that respond to a crash: law enforcement, rescue and EMS. Although the cost may be initially a factor the overall payoff in reduced risk for all crashes would be exponential.

Determining which improvement to apply to a given road is a complex process. As seen in the previous pages, motor vehicle crashes in Georgia crashes are the result of a complex combination of factors and events. Only with accurate crash data and crashes located correctly it is possible to determine the crash cause and what to do to reduce crash risk.

One-third of all fatal crashes in Georgia in 2006 were on off-system roads and almost all of these fatal crashes were on two-way roads without any separation. 492 of the 531 fatal off-system crashes occurred on two-way roads without a separation.

The majority of fatal crashes on off-system roads occurred on two-way roads without a separation –more than nine out of ten fatal crashes.

Two-way roads without a separation accounted for 92.7 percent of all off-system fatal crashes and they represented 33.0 percent of all fatal crashes.

For on-system roads five out of ten injury crashes were on two-way roads without a separation compared with nine out of ten for off-system roads.

In addition to absolute numbers the proportions are important here for identifying high risk roads and putting the human and economic cost in perspective.

Off-System Crashes, 2006
Two-way Roads Without Separation
Percent of All Crashes

	All Crashes	Two-way Roads Without Separation	
	Number	Number	Percent
Crashes			
Off-System	120,104	106,582	88.7
On-System	193,017	101,459	52.6
Total	313,121	208,041	66.4
Injury Crashes			
Off-System	30,252	27,438	90.7
On-System	50,941	28,488	55.9
Total	81,193	55,926	68.9
Fatal Crashes			
Off-System	531	492	92.7
On-System	958	592	61.8
Total	1,489	1,084	72.8

Crash-location linked data

For total crashes off-system roads accounted for 38 percent of all crashes in Georgia. Of those a little over half were on two-way roads without a median or barrier to separate traffic.

In absolute numbers 106,582 crashes occurred on two-way off-system roads without a separation or a barrier.

For fatal crashes off-system roads accounted for 36 percent of all crashes. Of those, 92.7 percent were on two-way roads with out a median or barrier to separate traffic.

In absolute numbers 492 fatal crashes occurred on two-way off-system roads without a separation or a barrier.

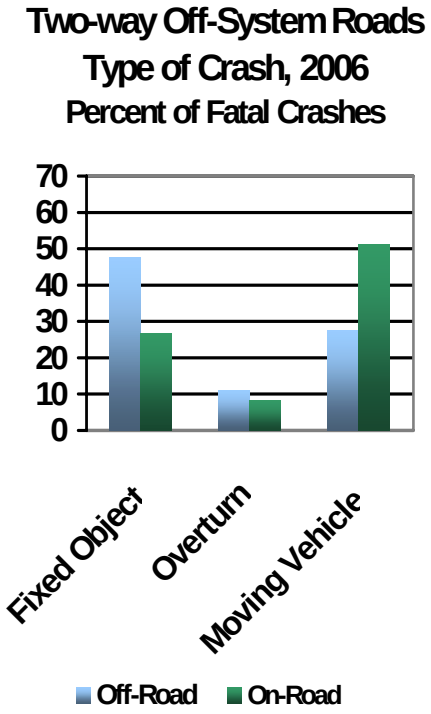
**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

Of the 492 fatal crashes on two-way off-system roads half were fixed object crashes.

Fixed object crashes accounted for almost half of the off-system fatal crashes. In comparison for on-system roadways only one out of four fatal crashes were fixed object crashes.

The opposite is true for crashes involving another moving vehicle. On two-way roads without a separation moving vehicle crashes were 28 percent of the off-system fatal crashes but 51 percent of the on-system fatal crashes.

The way crashes happen and the type of crash is important in choosing the appropriate road improvement for that road segment. Clearly specific engineering improvements that address the three major types of crashes are needed on the high risk two-way road without a median or barrier.



One out of ten fatal crashes on two-way off-system roads were head on collisions. One-third of these head on fatal crashes occurred at dusk, dawn or night.

Single vehicle crashes represented 70.1 percent of the fatal crashes on two-way off-system roads. Of those single vehicle crashes, 60.9 percent did not happen in daylight they occurred at dusk, dawn or night.

Off-System Roads Two-way Without Separation: Type of Crash, 2006
Number and Percent of Total Crashes

	Total Crashes	Moving Vehicle		Overturn		Fixed Object	
		Number	Percent	Number	Percent	Number	Percent
Off-System							
Crashes	106,582	71,732	67.3	2,589	2.4	19,062	17.9
Injury Crashes	27,438	17,049	62.1	1,483	5.4	6,615	24.1
Fatal Crashes	492	136	27.6	56	11.4	234	47.6
On-System							
Crashes	101,459	83,306	82.1	1,792	1.8	8,606	8.5
Injury Crashes	28,488	22,521	79.1	1,063	3.7	3,421	12.0
Fatal Crashes	592	303	51.2	50	8.4	160	27.0

*Percent of total crashes does not add up to 100 due to other crash types.
**Crash-location linked data

**See pages 20, 21, 23, and 25-27 for effective road treatments that reduce crash risk.*

Road improvements for two-way roads have two objectives:

The first is to reduce the risk of vehicles leaving their lane and drifting into oncoming traffic and reduce the risk of them leaving the road altogether.

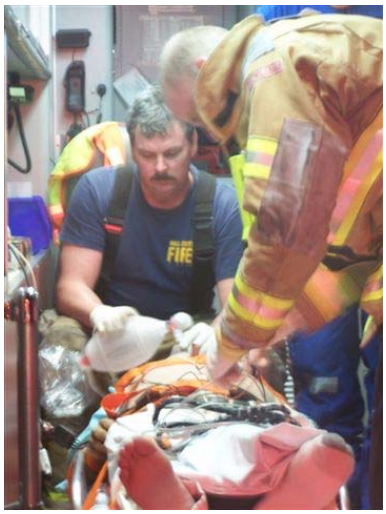
The second goal is to reduce the severity of a crash if a vehicle does leave their lane or run off the roadway.

Road improvements:

- centerline rumble strips
- shoulder rumble strips
- road edge repair
- add safety wedge
- add median
- concrete or cable barriers
- increased access control
- widen lanes
- roadside obstacle removal
- shield roadside obstacle
- resurface roadway pavement
- apply traction compound
- wider shoulders
- pave shoulders
- new pavement lane markings
- reduce curve angle
- larger signage
- new clearer signage
- breakaway posts for barriers & signage
- install/improve lighting
- grade reduction on slopes
- improved access control
- adding turn lanes

The basic road improvements that are effective for reducing crashes on two-way roads may also be effective for addressing off road crashes or reducing the risk of crashes on curves.

Examples of specific effective road treatments that reduce the risk of crashing can be found on the following pages.



By preventing the vehicle from leaving the roadway you also reduce the number of fixed object crashes. However once the vehicle has left the road a different approach is needed to reduce the risk of hitting a fixed object.

One out of ten fatal crashes on two-way off-system roads were head on collisions resulting from vehicles leaving their lane and moving into oncoming traffic.

Centerline rumble strips are a cost effective road treatment that warns drivers they are leaving their lane

Major roadway treatments for two-way roads without a separation include adding a median or physical barrier such as a cable barrier. Cable barriers are recommended because they provide an effective barrier that gives as the vehicle hits it reducing the risk of injury when compared to solid barriers.

Adding a physical barrier such as concrete or W-beam guardrail effectively separates traffic.

Off road crashes are deadly. Of the 492 fatal off-system fatal crashes 57 percent were run-off-road crashes -279 fatal crashes on two-way roads without a separation.

The majority of fatal off road crashes on off-system roadways were either fixed object or rollover crashes. These types of crashes are particularly deadly so any improvement that reduces the risk of leaving the roadway will also reduce injuries and fatalities.

These are the same roads EMS must travel to get to the crash scene. Often an ambulance must travel at a higher rate of speed than the roadway was designed for, and if the road is high risk to begin with the speed exponentially increases the risk.

Two-way roads with a median or barrier account for less than one out of ten crashes overall. The addition of a median or barrier greatly decreases the risk of crashing. Many off-system two-way roads do not have a median or separation.

Off Road Crashes
Off-System Roadways, 2006
Number and Percent of All Crashes

	All Roads	Without Separation		With Median		With Barrier	
	Number	Number	Percent	Number	Percent	Number	Percent
Crashes							
On Road	96,502	84,316	87.4	7,821	8.1	6,962	7.2
Off Road	23,602	22,266	94.3	704	3.0	570	2.4
Total	120,104	106,582	88.7	8,525	7.1	7,532	6.3
Injury Crashes							
On Road	21,915	19,464	88.8	1,645	7.5	1,430	6.5
Off Road	8,337	7,974	95.6	192	2.3	154	1.8
Total	30,252	27,438	90.7	1,837	6.1	1,584	5.2
Fatal Crashes							
On Road	238	213	89.5	11	4.6	10	4.2
Off Road	293	279	95.2	5	1.7	3	1.0
Total	531	492	92.7	16	3.0	13	2.4

Crash-location linked data

Eighty-one percent of the 279 off-system off road fatal crashes were fixed object crashes.

Of those fixed object crashes 39 percent involved the vehicle hitting a tree.

Of the 492 fatal off-system fatal crashes 57 percent were run-off-road crashes -279 fatal crashes on two-way roads without a separation.

Edgeline markings in a shoulder rumble strip warn the driver when drifting off the roadway.

Creating a gradual wedge on the edge of the roadway prevents loss of control of the vehicle when the driver tries to return to the roadway after dropping off the road. This is critical in preventing off road crashes.

Restriping faded pavement markings increases visibility.

Another economical alternative is to increase the striping from 4 inch to an 8 inch edge line for better visibility.

Increasing visual delineation is critical and can be achieved by a number of ways. By using two different looking materials for the road and the shoulder driver can better see the road.

Horizontal curves are high risk due to the increased potential for run-off-road crashes. Of the 279 run-off-road fatal crashes on off-system two-way roads 62 percent were on horizontal curves -173 fatal crashes on two-way roads without a separation.

There is also a greater risk of injury on off-system two-way roads without a separation on a curve, half of the non-fatal off road injury crashes were on a curve. In 2006 4,043 injury crashes occurred on a curved road segment.

Although we have no exact measure of the proportion of road segments that are curved or the proportion of very sharp curved road segments we know that straight segments outnumber curved road segments in Georgia.

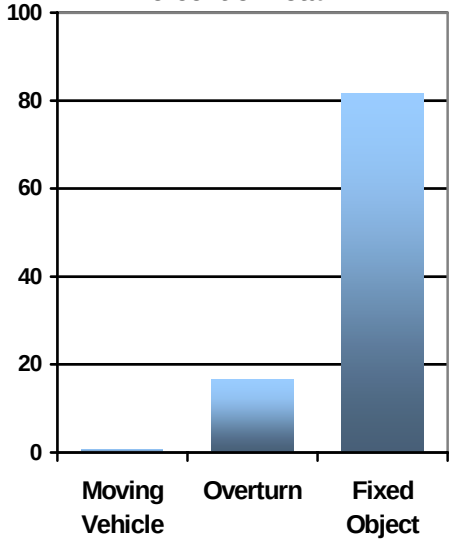
Overall for off system two-way roads without a separation 15 percent of the crashes occurred on a curve, 9,430 of the 22,266 crashes. For fatal crashes, almost half were on a curve, 229 of the 492 fatal crashes.

Crashes on a Curve, 2006
Two-way Off-System Roads
Without a Separation
Number and Percent on Curve

	Crashes	On Curve	Percent
Crashes			
On Road	84,316	6,758	8.0
Off Road	22,266	9,430	42.4
Total	106,582	16,188	15.2
Injury Crashes			
On Road	19,464	1,994	10.2
Off Road	7,974	4,043	50.7
Total	27,438	6,037	22.0
Fatal Crashes			
On Road	213	56	26.3
Off Road	279	173	62.0
Total	492	229	46.5

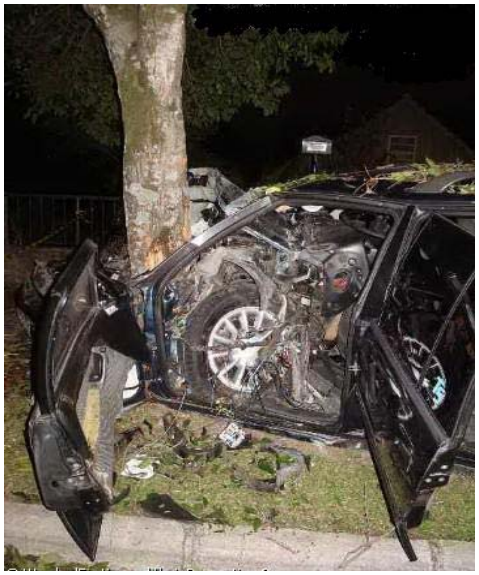
*Crash-location linked data

Fatal Crashes On A Curve
Type of Crash, 2006
Percent of Total



Of the 173 off-system off road fatal crashes on a curve 141 or 82 percent were fixed object.

Of those 141 fatal fixed object crashes one third were crashes into trees.



Horizontal curves are high risk due to the increased potential for run off the road crashes. Of the 279 run off the road fatal crashes off-system two-way roads 62 percent were on horizontal curves -173 fatal crashes on two-way roads without a separation.

In many cases increasing tire traction with compounds that bind to the pavement and help keep cars on the road can reduce run-off-road crashes significantly for very little cost.

Widening a shoulder outside of a curve can be very effective on certain sharp segments. It is less economical but an effective alternative.

Drivers do not like surprises. Sometimes something as basic as improved or larger signage can reduce the crash risk on high risk roads. This is even more important if driving at night or for older drivers.

Adding speed limit advisory markings is another relatively low cost means of providing the visual clues that reduce risk.

Direction arrows called chevrons are a proven means of defining a curve to drivers. Advance curve warning signs as above must also be used along with correct spacing of the chevrons.

Another economical alternative is to add high retroreflective marking to existing barriers or posts.

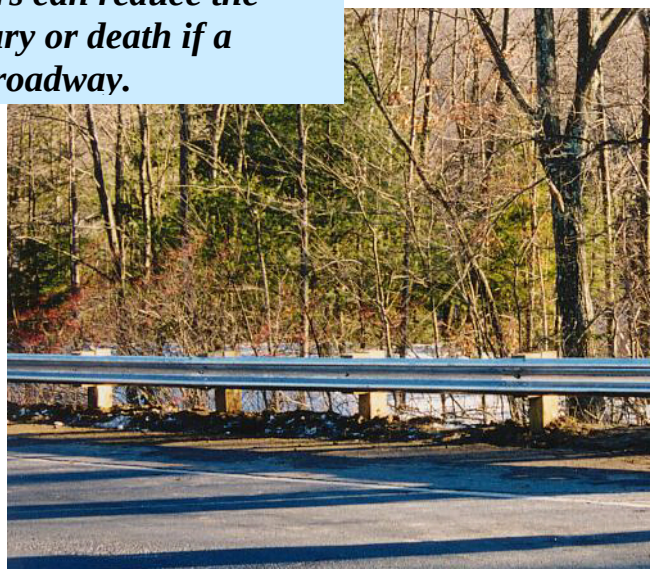
Reducing the consequence if a vehicle leaves the road can save lives. Of the 492 fatal crashes on two-way off-system roads half were fixed object crashes. Of the 173 off-system off road fatal crashes on a curve 141 or 82 percent were fixed object. Of those 141 fatal fixed object crashes one third were crashes into a tree.

An economical alternative is to clear under brush, trees and posts to create a clear zone.

Breakaway Posts

All signs and posts must be made to break on impact thus reducing injury in the event of a crash.

Physical barriers can reduce the risk of serious injury or death if a vehicle leaves the roadway.



High risk roads in review….

Three out of four fatal crashes occurred on two-way roads with no separation they are the highest risk roadways.

Off road fatal crashes accounted for 41 percent of all fatal crashes in Georgia in 2006.

Of the 613 off road fatal crashes on two way roads 485 occurred on roads without any separation.

Horizontal curves are one of the major road characteristics that increase the risk of crashing. Of the 485 fatal off road crashes on two-way roads without any separation 277 occurred on a curve.

The success of programs like GDOT's Off System Program will take many years to evaluate. Evaluating the success of a specific road segment improvement is challenging because often the starting numbers are very small and any real change good or bad difficult to detect. One solution is to compare an average of multiple years from before the improvement to multiple years average after the improvement. This often compensates for the variability found when working with small numbers. A number of complex algorithms have been used with varying degrees of success. The measure of success for any improvement needs to be carefully chosen –one test may work better for certain types of crashes or roadways than another.

High risk roads in review….

Of the 1,084 fatal crashes on two-way roads without a separation about half were on off-system roads -492 fatal crashes.

Of the 492 fatal off-system fatal crashes 57 percent were run-off-road crashes -279 fatal crashes on two-way roads without a separation.

Of the 279 run-off-road fatal crashes two-way off-system roads 62 percent were on horizontal curves -173 fatal crashes on two-way roads without a separation.

Adverse effects have been documented with even the most effective improvement. For example rumble strips could pose difficulties for cyclists in certain areas. The effectiveness of the treatment needs to out weigh any negative effect before installation.

One key fact is that by counting crashes or fatalities we are only counting crash events –we have no real measure of absolute true exposure and we have no measure of negative events. We have no measure of the near misses –the crashes that did not happen thanks to a road edge rumble strip or an injury that did not lead to death because EMS was at the scene. We have no negative control to measure against only the crashes, injuries and fatalities. So documenting the reduction of risk after specific improvements is always difficult. All we can measure are fewer crashes or fatalities to show a lower risk afterward.

Risk and the Vehicles…..
Section III

***C*rash *A*nalysis, *S*tatistics & *I*nformation**

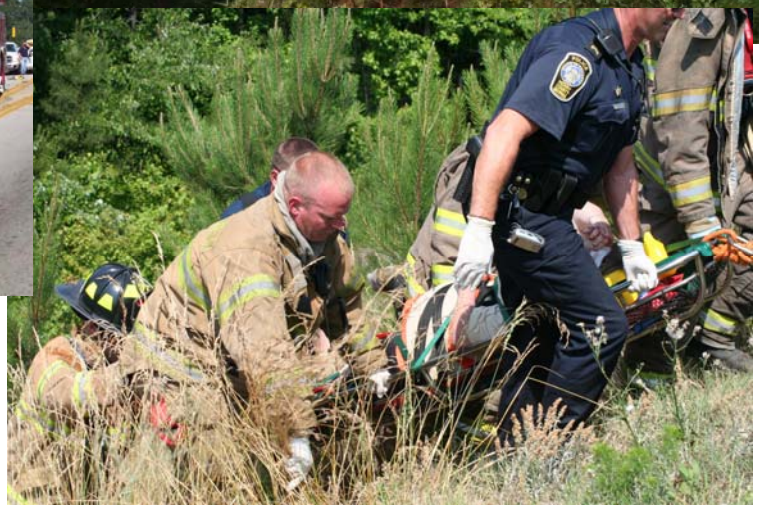
Georgia Department of Transportation **January 2008**

This section will cover the vehicles, their risk factors and risk reduction engineering, past, present and future innovations. Because crash risk cannot be separated from the characteristics of the roadway a special report will examine vehicles on high risk roadways.

Connections…..

The Crash Report

'Single late model pickup truck headed east on two-way undivided road.
Driver failed to negotiate curve and lost control of vehicle.
Vehicle rolled over three times.
Driver was partially ejected through the passenger window.
The vehicle came to rest on top of the victim's torso
Victim was not wearing his seat belt
EMS arrived on scene and found drivers body lifeless'
-Law Enforcement Officer and EMS on scene.



Crash report narrative is taken from crash reports by Georgia law enforcement officers. Photographs are purely for descriptive purposes and are not from the crash scene.

As with roadways, unique vehicle characteristics are a factor in motor vehicle crashes and in the severity of a crash.

The interior of a vehicle acts as a safe zone protecting the occupants, the stronger the walls, the roof and the structure of the vehicle the greater the reduction in risk to the occupants. A key factor here is if the vehicle occupants take advantage of this 'room to live' and use seat belts. Failure to do so negates the safe zone and the occupant is either violently thrown against the interior of the vehicle or totally ejected.

In crashes where two or more vehicles are involved disparity in vehicle size can be a major factor in injury severity. Often called incompatible crashes, disparity in vehicle weight can predict who is injured and how seriously they are injured.

Many other factors come into play such as the tendency of the vehicle to tip and rollover, or excessive speed going beyond the design of the vehicle, the road or the driver's ability.

Examining the risk inherent to the vehicle is what drives vehicle improvements that have three goals: to reduce the risk of injury to the occupants, reduce the severity of injury and reduce the crash risk altogether. Good vehicle design and construction addresses all three primary goals especially the last goal. It is important to remember that the best way to prevent injuries or death is to prevent the crash itself but there is no risk free vehicle.

This section will examine the crash risk involved with passenger cars, specialty vehicles, large trucks and motorcycles. Each vehicle type poses challenges in reducing potential crash risk but just examining the vehicles alone is not enough. How the crashes happen and the type of road they occur on adds essential information. Vehicle improvements that reduce crash and injury will be discussed to provide a better picture of risk and the vehicles.

Although pickup trucks were involved in 20.2 percent of the vehicles in fatal crashes they accounted for only 15.5 percent of vehicles in crashes over all. The higher involvement in fatal crashes indicates pickup trucks are at higher risk for fatal crashes.

Motorcycles have an even greater higher risk. They represented 0.6 percent of all vehicles in crashes overall but 6.2 percent of the vehicles in fatal crashes –the fatal crash proportion is ten times higher than their risk of crashing overall.

Vehicles Involved in Motor Vehicle Crashes, 2006

Vehicle Type	Crashes		Nonfatal Injury Crashes		Fatal Crashes	
	Number	Percent	Number	Percent	Number	Percent
Passenger Car	369,661	57.0	94,660	56.4	1,035	40.9
Pickup Truck	100,637	15.5	25,751	15.3	511	20.2
Sport Utility Vehicle	96,051	14.8	24,823	14.8	354	14.0
Van	39,732	6.1	10,438	6.2	143	5.6
Tractor Trailer	13,275	2.0	2,919	1.7	158	6.2
Single Unit Truck	7,866	1.2	1,767	1.1	56	2.2
Motorcycle, Minibike	4,180	0.6	2,974	1.8	157	6.2
Other	3,844	0.6	834	0.5	10	0.4
Bus	3,285	0.5	622	0.4	11	0.4
Vehicle with Trailer	2,923	0.5	731	0.4	20	0.8
Panel Truck	2,153	0.3	406	0.2	11	0.4
Truck Tractor	1,004	0.2	219	0.1	9	0.4
Bicycle	937	0.1	729	0.4	17	0.7
Logging Tractor Trailer	685	0.1	207	0.1	9	0.4
Farm or Construction Equipment	416	0.1	122	0.1	5	0.2
All Terrain Vehicle	335	0.1	185	0.1	13	0.5
Motorized Recreational Vehicle	318	0.0	119	0.1	2	0.1
Tractor / Twin Trailers	298	0.0	78	0.0	4	0.2
Ambulance	286	0.0	61	0.0	3	0.1
Logging Truck	238	0.0	54	0.0	2	0.1
Truck Towing House Trailer	136	0.0	25	0.0	1	0.0
Moped	58	0.0	41	0.0	0	0.0
Go Cart	21	0.0	12	0.0	1	0.0
Total	648,339	100.0	167,777	100.0	2,532	100.0

*Crash data does not differentiate between large and small makes of pickup trucks or SUV's and motorcycles and minibikes

The number of pickup trucks in fatal crashes increased 17 percent from 2000 to 2006. Even when adjusted for the increase in the number of registered vehicles the fatal crash rate increased 5.7 percent.

From 2000 to 2006, the crash rate per 10,000 registered vehicles for all three types of passenger vehicles remained the same or decreased slightly.

Vehicles Involved in Motor Vehicle Crashes, 2000-2006
Number and Rate per 10,000 Registered Vehicles

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Crash Vehicle								
Passenger Car	364,773	369,174	373,743	370,034	376,379	376,184	369,661	1.34
Rate	897.0	903.8	887.4	882.8	897.4	893.8	892.6	-0.49
Pickup Truck	95,387	97,677	100,776	100,056	103,908	104,233	100,637	5.50
Rate	657.7	663.4	656.9	647.1	672.1	670.3	624.2	-5.08
Sport Utility Vehicle	53,543	61,984	71,990	79,215	87,864	94,238	96,051	79.39
Rate	693.4	722.7	733.4	745.6	760.3	751.8	701.2	1.12
Nonfatal Injury Vehicles								
Passenger Car	100,986	102,215	100,307	98,403	99,846	99,506	94,660	-6.26
Rate	248.3	250.2	238.2	234.8	238.1	236.4	228.6	-7.95
Pickup Truck	25,287	25,945	26,269	25,913	27,063	26,958	25,751	1.83
Rate	174.3	176.2	171.2	167.6	175.1	173.4	159.7	-8.38
Sport Utility Vehicle	14,095	16,245	18,567	20,612	23,193	24,929	24,823	76.11
Rate	182.5	189.4	189.1	194.0	200.7	198.9	181.2	-0.73
Fatal Crash Vehicles								
Passenger Car	1,101	1,127	1,046	1,091	1,110	1,103	1,035	-5.99
Rate	2.71	2.76	2.48	2.60	2.65	2.62	2.50	-7.69
Pickup Truck	435	466	423	443	470	523	511	17.47
Rate	3.00	3.17	2.76	2.87	3.04	3.36	3.17	5.68
Sport Utility Vehicle	223	275	263	274	297	375	354	58.74
Rate	2.89	3.21	2.68	2.58	2.57	2.99	2.58	-10.52
Registered Vehicles								
Passenger Car	4,066,530	4,084,746	4,211,547	4,191,745	4,194,287	4,208,585	4,141,179	1.84
Pickup Truck	1,450,416	1,472,296	1,534,145	1,546,121	1,545,912	1,554,995	1,612,188	11.15
Sport Utility Vehicle	772,184	857,729	981,648	1,062,398	1,155,688	1,253,568	1,369,870	77.40

*Crash data does not differentiate between large and small makes of pickup trucks or SUV's.

Rollover and fixed object crashes are more deadly than crashes with another vehicle. Overturn crashes accounted for only one out of 100 crashes, in comparison they represented one out of ten fatal crashes.

Vehicles such as pickup trucks and sport utility vehicles (SUV) that sit higher up and also have a proportionally narrow wheel base may have a tendency to rollover under certain conditions. The crash data reflects this.

- The proportion of pickup trucks or SUV's in rollover crashes is twice that of passenger cars, 1.1 percent of the passenger car crashes involved an overturned vehicle compared with 2.1 percent for pickup trucks and 2.6 percent for SUV's.
- In injury crashes the disparity is even greater, 4.9 percent of the pickup truck injury crashes were rollover crashes and rollover crashes represented 6.4 percent of the SUV injury crashes compared with 2.4 percent for passenger cars.
- The difference is even greater in fatal crashes. Rollover crashes account for one out of ten fatal crashes for passenger cars. In comparison one out of five fatal pickup truck crashes are rollover crashes.
- The crash data does not differentiate between large and small pickup trucks and does not contain the specific physical characteristics of pickup trucks or SUV's such as weight, wheel base, or other features so the crash data cannot be broken out by these specific vehicle characteristics.

Type of Crash, 2006
Number of Vehicles and Percent

Crashes	Overturn	Percent	Moving Vehicle	Percent	Fixed Object	Percent	Total
Passenger Car	4,242	1.1	322,177	87.2	23,378	6.3	369,661
Pickup Truck	2,156	2.1	85,340	84.8	6,643	6.6	100,637
Sport Utility Vehicle	2,464	2.6	83,440	86.9	5,141	5.4	96,051
Nonfatal Injury Crashes							
Passenger Car	2,258	2.4	81,589	86.2	7,306	7.7	94,660
Pickup Truck	1,256	4.9	21,376	83.0	2,135	8.3	25,751
Sport Utility Vehicle	1,579	6.4	20,758	83.6	1,702	6.9	24,823
Fatal Crashes							
Passenger Car	107	10.3	592	57.2	195	18.8	1,035
Pickup Truck	78	15.3	296	57.9	80	15.7	511
Sport Utility Vehicle	78	22.0	184	52.0	58	16.4	354

*Crash data does not differentiate between large and small makes of pickup trucks or SUV's.

The number of vehicles in injury or fatal crashes is one measure of crash severity. Another measure is the proportion of vehicle occupants injured or killed in the crash.

The proportion of passenger cars and SUV occupants that were seriously injured or killed is somewhat similar until the type of crash is examined.

Pickup trucks showed a different pattern. Proportionally more occupants of pickup trucks were killed in crashes than cars and SUVs regardless of the crash type.

- Only pickup trucks showed a higher proportion of fatally injured occupants.
- Overall about 85 percent of all vehicle occupants escaped injury.

Severity of Injury, 2006

	Passenger Car		Pickup Truck		Sport Utility Vehicle	
	Number	Percent	Number	Percent	Number	Percent
Uninjured	416,923	84.10	111,262	86.63	120,529	85.84
Minor	59,334	11.97	10,711	8.34	14,087	10.03
Moderate	15,743	3.18	5,193	4.04	4,791	3.41
Serious	3,052	0.62	977	0.76	800	0.57
Injuries	78,129	15.76	16,881	13.15	19,678	14.02
Fatal	724	0.15	293	0.23	210	0.15
Total Occupants	495,776	---	128,436	---	140,417	---

- In rollover crashes more pickup truck or SUV occupants suffered moderate, serious or fatal injuries than passenger car occupants. Fewer occupants of pickup trucks and SUV's escaped injury than occupants of passenger cars in overturn crashes.
- Although pickup trucks are included with passenger cars many of them are used as work vehicles transporting produce, equipment or livestock.

Overturn Crashes
Severity of Injury, 2006

	Passenger Car		Pickup Truck		Sport Utility Vehicle	
	Number	Percent	Number	Percent	Number	Percent
Uninjured	2,873	48.12	1,227	41.59	1,529	38.21
Minor	1,241	20.78	554	18.78	865	21.61
Moderate	1,499	25.10	897	30.41	1,316	32.88
Serious	246	4.12	190	6.44	207	5.17
Fatal	112	1.88	82	2.78	85	2.12
Total Occupants	5,971	---	2,950	---	4,002	---

*Crash data does not differentiate between large and small makes of pickup trucks or SUV's.

In 2006, the average number of occupants per vehicle was 1.34 for cars, 1.28 for pickup trucks and 1.46 for SUV's.

Crashes between large trucks and smaller vehicles are deadly because large trucks are heavier than lighter vehicles and cannot stop quickly or maneuver to avoid a crash. One out of six fatalities in Georgia occurred in a crash involving a large truck.

- The number of crashes involving large trucks increased 12.22 percent from 2000 to 2006. The greatest increase was for tractors with twin trailers, 26.27 percent from 2000 to 2006.
- From 2000 to 2006, fatal crashes involving large trucks increased 12.26 percent. Fatal crashes involving both truck tractors and tractors with twin trailers increased more than 28 percent.

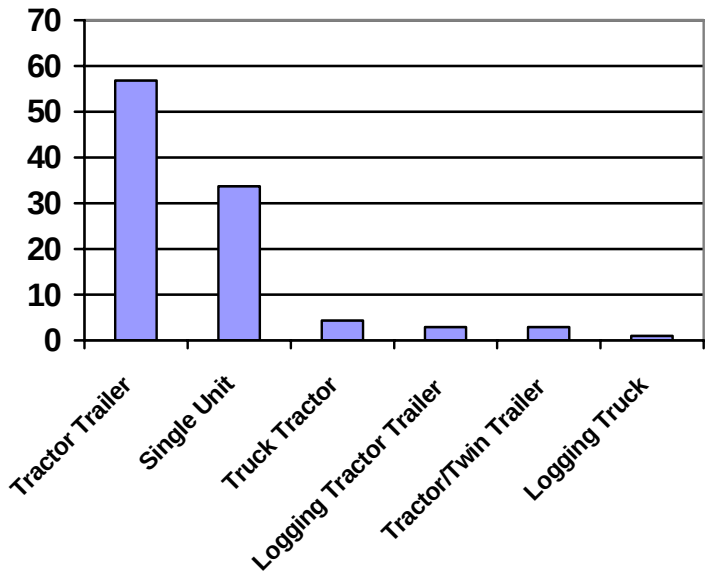
Large Trucks Involved in Motor Vehicle Crashes, 2000-2006

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Crash Vehicles								
Truck Tractor	1,006	1,017	920	908	1,003	972	1,004	-0.20
Tractor Trailer	11,401	11,631	11,779	12,018	12,861	13,784	13,275	16.44
Tractor / Twin Trailers	236	235	262	269	269	294	298	26.27
Logging Truck	223	224	189	237	214	176	238	6.73
Logging Tractor Trailer	635	584	641	703	702	682	685	7.87
Single Unit Truck	7,321	7,382	7,046	7,165	7,463	8,202	7,866	7.44
Total Large Truck	20,822	21,073	20,837	21,300	22,512	24,110	23,366	12.22
Nonfatal Injury Crash Vehicles								
Truck Tractor	230	285	232	243	236	214	219	-4.78
Tractor Trailer	2,702	2,677	2,676	2,709	3,019	3,226	2,919	8.03
Tractor / Twin Trailers	72	62	50	46	63	73	78	8.33
Logging Truck	57	57	35	61	58	38	54	-5.26
Logging Tractor Trailer	207	169	215	222	222	217	207	0.00
Single Unit Truck	1,759	1,700	1,620	1,633	1,683	1,896	1,767	0.45
Total Large Truck	5,027	4,950	4,828	4,914	5,281	5,664	5,244	4.32
Fatal Crash Vehicles								
Truck Tractor	7	10	11	3	10	3	9	28.57
Tractor Trailer	138	144	131	142	151	162	158	14.49
Tractor / Twin Trailers	3	3	3	3	4	5	4	33.33
Logging Truck	4	1	1	1	0	2	2	-50.00
Logging Tractor Trailer	12	15	12	11	16	13	9	-25.00
Single Unit Truck	48	62	53	47	64	68	56	16.67
Total Large Truck	212	235	211	207	245	253	238	12.26

The vast majority of the fatal large truck crashes in 2006 involved a crash with another moving vehicle, 79.4 percent compared with 57.2 percent for passenger cars.

The proportion of rollover or fixed object fatal crashes was lower for large trucks. Rollover fatal crashes accounted for 3.8 percent of the large truck crashes compared with 10.3 percent for passengers crashes. Fixed object fatal crashes were 5.5 percent of the large truck crashes compared with 18.8 percent for passenger cars.

Large Truck Motor Vehicle Crashes, 2006
Percent of Large Truck Crashes



- Tractor trailers are the typical large commercial transport vehicles. Tractor trailers were involved in 56.8 percent of the large truck crashes and 66.4 percent of the fatal crashes involving large trucks.

- Single unit trucks are the smallest of the large trucks and the most numerous. Single unit trucks accounted for 33.4 percent of the large truck crashes and 23.5 percent of the fatal crashes.

- A truck tractor is the truck cab without the trailer. Truck tractors accounted for 4.3 percent of the large truck crashes and 3.8 percent of the fatal crashes. Tractor with twin trailers are one of the largest of the large trucks. They represented 1.28 percent of the crashes and 1.7 percent of the fatal crashes.

- Logging tractor trailers are larger than logging trucks and are not designed to go off the road on soft dirt and rough terrain. Logging tractor trailers were in 2.9 percent of the large truck crashes and 3.78 percent of the fatal crashes.

- Logging trucks are designed to go off the road and generally transport logs from the field to a transfer station. The lowest number of crashes occurred with logging trucks. Logging trucks are smaller than logging tractor trailers, spend a high percent of their time off road and when on road travel only short distances.

A crash between incompatible vehicles such as when a much larger vehicle crashes with a smaller vehicle results in considerably greater damage to the smaller vehicle and the vast majority of injuries are to occupants of the smaller vehicle.

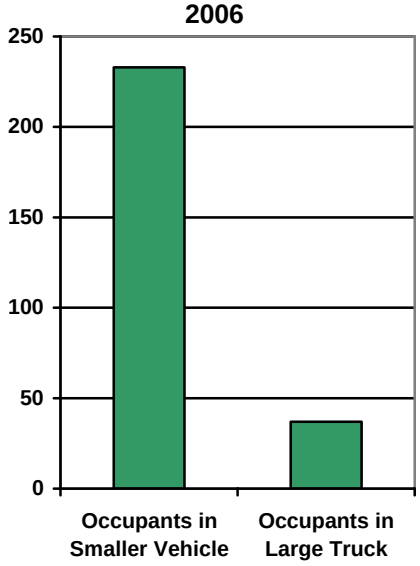
- The occupants of the large truck have a much lower risk of injury because the sheer mass of the large truck protects them in the event of a crash. In addition they sit very high up, well above the point of impact with a smaller vehicle thus reducing direct impact on the large vehicle occupant.

- Of the 270 fatalities that occurred in crashes involving at least one large truck in 2006, 86.3 percent of the people killed were occupants of the smaller vehicle compared with 13.7 percent for the large truck occupants.

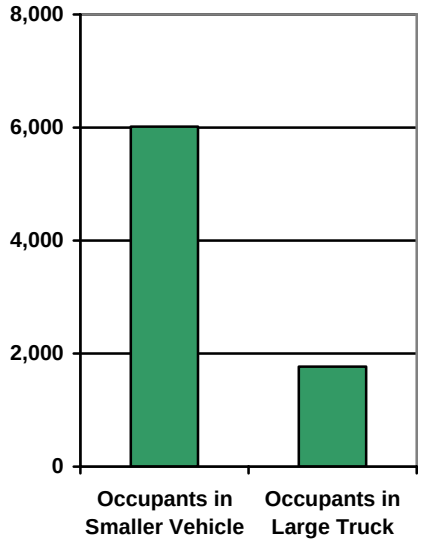
- In 50.2 percent of the fatal multiple-vehicle crashes involving a large truck the impact point was the front of the large truck. In 16.7 percent of the fatal multiple-vehicle large truck crashes the large truck was struck from the rear by the other vehicle.

Risk in Perspective:
In a crash with a large truck you are in much greater risk of being injured or killed if you are in the smaller vehicle. Fewer occupants of large trucks are injured in crashes compared with occupants of passenger cars. In 2006, 15.8 percent of the occupants of passenger cars were injured compared with 6.9 percent of large truck occupants.

Fatally Injured Occupants in Large Truck Crashes, 2006



Injured Occupants in Large Truck Crashes, 2006



Motorcyclists are at greater risk of being injured or killed in motor vehicle crashes. Unlike other vehicles motorcycles do not provide any physical protection for the driver or passenger. Because of this risk motorcyclists require specialized driver education and unique driving skills.

- From 2000 to 2006, motorcycle crashes accounted for 774 fatalities and 15,292 injuries.
- Of all the people killed in motor vehicle crashes in Georgia in 2006 more than one out of 11 were killed in a motorcycle crash.
- The proportion of all Georgia fatalities that involved motorcycles increased from 2000 to 2006. In 2000 3.9 percent of all fatalities involved a motorcycle. In comparison in 2006 motorcycle crashes accounted for 8.69 percent of the fatalities.
- The number of registered motorcycles increased 60.1 percent from 2000 to 2006.
- The crash rate for motorcycles increased 25.34 percent from 2000 to 2006. Motorcycle injury crashes showed a similar increase. The motorcycle injury crash rate increased 22.13 percent from 2000 to 2006.
- In contrast the increase in the fatality rate for motorcycle crashes was more than double the increases for crashes and injury crashes. The motorcycle fatal crash rate increased 60.76 percent from 2000 to 2006. The actual number of motorcycles in fatal crashes went from 61 in 2000 to 157 in 2006.

Motorcycles Involved in Motor Vehicle Crashes, 2000-2006
Number of Vehicles in Crashes and Rate per 10,000 Registered Motorcycles

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Crashes	2,083	2,533	2,499	2,930	3,371	3,738	4,180	100.67
Rate	236.5	275.5	229.2	246.9	260.4	263.2	296.5	25.34
Nonfatal Injury Crashes	1,521	1,851	1,775	2,093	2,414	2,664	2,974	95.53
Rate	172.7	201.3	162.8	176.4	186.5	187.6	210.9	22.13
Fatal Crashes	61	98	85	113	113	147	157	157.38
Rate	6.9	10.7	7.8	9.5	8.7	10.4	11.1	60.76
Registered Vehicles	88,071	91,946	109,024	118,671	129,439	142,010	141,000	60.10

*Includes motorcycles and minibikes

The dramatic increase in fatal motorcycle crashes seen on the previous pages is not due solely to the increase in registered vehicles because the motorcycle crash rate did not increase as much as the fatal crash rate.

Fatal crashes have different contributing factors and occur under different circumstances than non-fatal crashes. There was no difference between 2000 and 2006 for contributing factors or how the crash happened so what caused the increase in fatal motorcycle crashes?

- The major contributing factors in crashes overall are following too closely or failure to yield, in comparison fatal crashes more often involve driver lost control or speed. In 2006, the top contributing factors noted in motorcycle fatal crashes were driver lost control reported 56 times, and unsafe or illegal speed noted 36 times. Following too close was noted six times and failure to yield was recorded five times in fatal motorcycle crashes.

- In 2006, 59.9 percent of the motorcycle crashes involved collision with another vehicle. 24.8 percent of the motorcycle crashes were crashes with a fixed object and 10.2 percent were rollover crashes. In comparison in 2000 the pattern was similar except for a smaller proportion of motorcycles involved in crashes with another vehicle 50.8 percent in 2000 compared with 59.9 in 2006.

- One possible reason for the increase in fatal motorcycle crashes may be driver age. There has been a gradual but dramatic increase in motorcycle fatalities for middle age and older bikers. From 2000 to 2006, motorcycle drivers in fatal crashes under age 40 increased 117.1 percent. In contrast for drivers over age 39 the increase was 254.6 percent.

- Older persons not only are more susceptible to injury they also have serious physical challenges. A multitude of physical changes occur as people age: decline in vision, loss of flexibility resulting in trouble turning head, loss of bone density increasing risk of fractures, hearing impairment, lower reflexes and many other changes. These changes are a factor when driving any vehicle but are even more important as a motorcycle driver.

Motorcycle Drivers in Fatal Crashes by Age
Number and Percent of Total Drivers

	2000		2006	
	Number	Percent	Number	Percent
Under Age 40	35	61.4	76	49.4
Over Age 39	22	38.6	78	50.6
All Drivers	57	---	154	---
Unknown Age	4	---	3	---

*Includes motorcycles and minibikes

- Motorcycle crashes can inflict serious trauma and the older individual may not tolerate the injury as well as a younger person. Motorcycle driver education needs to be repeated periodically to ensure safety.

Motorcycles are affected by incompatible vehicle size factors perhaps more than any single vehicle type. They are smaller then almost every other type of vehicle on the road.

Seventy-two percent of motorcyclists were either injured or killed compared with only 16 percent of the occupants of passenger cars.

- In contrast, 84.1 percent of passenger car occupants in crashes were not injured compared with only 27.6 percent of motorcyclists.

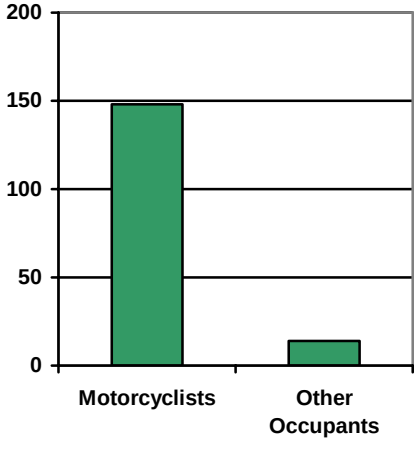
Severity of Injury, 2006

	Motorcycle		Passenger Car	
	Number	Percent	Number	Percent
Uninjured	1,236	27.55	416,923	84.10
Minor	767	17.09	59,334	11.97
Moderate	1,852	41.27	15,743	3.18
Serious	484	10.79	3,052	0.62
Fatal	148	3.30	724	0.15
Total Occupants	4,487	---	495,776	---

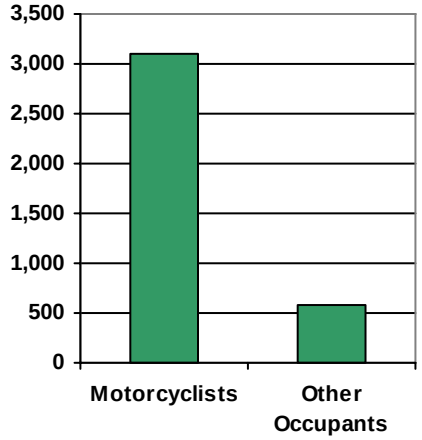
*Includes motorcycles and minibikes

- The percent of motorcyclists seriously injured was much greater than for passenger car occupants. 10.8 percent of motorcyclists were seriously injured compared with 0.6 percent of passenger car occupants.
- Even for moderate injuries motorcyclists had a higher risk, 41.3 percent of motorcyclists had moderate injuries compared with 3.18 percent for passenger car occupants.
- 82.1 percent of the motorcyclists killed were reported as wearing a helmet.
- Evaluating risk in motorcycle crashes is difficult because we have no measure of the miles traveled or possible exposure to crashes. But the proportion of vehicle occupants injured or killed can provide an accurate measure of injury risk.
- By any measure motorcyclists face a higher risk of injury or death in motor vehicle crashes.

Fatally Injured Occupants in Motorcycle Crashes, 2006



Injured Occupants in Motorcycle Crashes, 2006



The degree of risk involved with certain vehicle types can be determined by a number of means. Comparing the number of vehicles involved in crashes give us an idea of crash risk by vehicle type.

Calculating a crash rate by dividing the number of crash vehicles by the number of registered vehicles provides the risk based on exposure by vehicle type when available. We do not have the actual number of vehicle miles traveled by each vehicle type although it would be a better estimate of risk.

A different measurement of risk is to compare the injury severity of the vehicle occupants by vehicle type. This gives us the increased risk of injury for certain types of vehicles.

Yet another measurement is to compare earlier years data to see if the risk has increased or decreased. This can be done by injury severity or just by the increase or decrease in the number of vehicles in crashes.

Comparing overall crash frequency to injury or fatal crash frequency also provides a measure of risk of injury or death.

The manner or way the crash occurred is an important factor. Some vehicle types have a lower risk when they are struck a certain way compared to others. Crashes that occur at an angle can be particularly serious. The impact point is often directly at the driver resulting in serious injury or death.

Certain types of crashes have a higher risk of injury than others for certain vehicles. Rollover crashes pose a higher risk of injury and death than crashes with another vehicle. Roads play an important role as well and high risk roads are a critical factor for all types of vehicles.

In 2000 sport utility vehicles accounted for about one out of ten of all vehicles in injury and fatal crashes and crashes overall. In 2006 they represented one out of seven vehicles in all crashes.

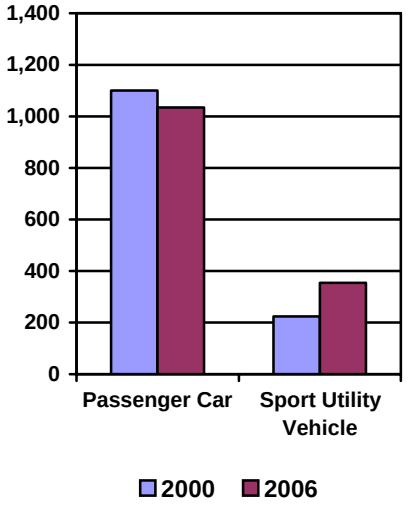
- In 2006, passenger cars represented 57.0 percent of all vehicles in fatal crashes. Pickup trucks accounted for 15.5 percent and sport-utility vehicles accounted for 14.8 percent of the vehicles involved in fatal crashes.

Vehicles by Crash Severity

	2000 Crash	Percent	2006 Crashes	Percent
Crash Vehicle				
Passenger Car	364,773	62.2	369,661	57.0
Pickup Truck	95,387	16.3	100,637	15.5
Sport Utility Vehicle	53,543	9.1	96,051	14.8
Van	37,129	6.3	39,732	6.1
Large Truck	20,822	3.5	23,366	3.6
Motorcycle, Minibike	2,083	0.4	4,180	0.6
Other*	13,165	2.2	14,712	2.3
Total	586,902	100.0	648,339	100.0
Nonfatal Injury Crash Vehicle				
Passenger Car	100,986	62.9	94,660	56.4
Pickup Truck	25,287	15.7	25,751	15.3
Sport Utility Vehicle	14,095	8.8	24,823	14.8
Van	10,031	6.2	10,438	6.2
Large Truck	5,027	3.1	5,244	3.1
Motorcycle, Minibike	1,521	0.9	2,974	1.8
Other*	3,607	2.2	3,887	2.3
Total	160,554	100.0	167,777	100.0
Fatal Crash Vehicle				
Passenger Car	1,101	48.7	1,035	40.9
Pickup Truck	435	19.3	511	20.2
Sport Utility Vehicle	223	9.9	354	14.0
Van	142	6.3	143	5.6
Large Truck	212	9.4	238	9.4
Motorcycle, Minibike	61	2.7	157	6.2
Other*	85	3.8	94	3.7
Total	2,259	100.0	2,532	100.0

* Other includes Panel Truck, Vehicle with Trailer, Ambulance, Truck Towing Trailer, Motorized Recreational Vehicle, Moped, Bicycle, Farm or Construction Equipment, All Terrain Vehicle, Go-Cart, and Other

Vehicles in Fatal Crashes 2000 and 2006



- The proportion of large trucks in crashes remained about the same from 2000 to 2006. In 2006 large trucks accounted for 9.4 percent of the vehicles in fatal crashes although they represented 3.6 percent of the vehicles in crashes overall.

- In 2006 motorcycles and minibikes represented 6.2 percent of the vehicles in fatal crashes although they accounted for only 0.4 percent of the vehicles in crashes overall. The proportion of motorcycles and minibikes in crashes, injury crashes and fatal crashes increased from 2000 to 2006.

- The proportion of pickup trucks in crashes, injury crashes and fatal crashes remained essentially unchanged from 2000 to 2006.

In the event of a crash the safest place to be is securely belted in the passenger compartment often called the 'room to live'. Without the protective restraint of the seat belt the passenger is propelled at massive velocity either against the vehicle compartment or ejected out of the vehicle.

Over the past seven years, the lowest seat belt usage was for occupants who were fatally injured.

Another way to examine the risk is to look at the severity of injury for those belted compared with unbelted passengers. More passengers were injured and their injuries were more severe if the passenger was not wearing their seat belts.

In 2006, of the vehicle occupants not injured 80.5 percent were wearing their seat belts compared with only 37.5 percent for those killed.

For seriously injured adult occupants seat belt usage was just 57.0 percent compared with 81.5 percent for those receiving only minor injuries.

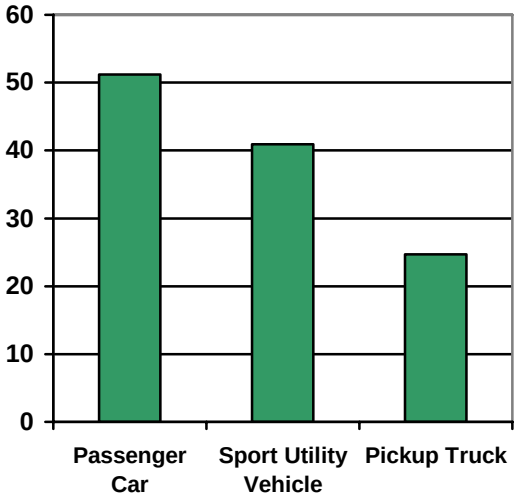
Seat belt usage is directly correlated with injury severity. The more severe the injury the lower seat belt usage.

Clearly seat belts greatly reduce the risk of injury or death in a crash.

In 2006 seat belt use was remarkably similar between pickup truck, passenger car and sport utility vehicle adult uninjured occupants. The differences in occupant seat belt use appear in injury and fatal crashes.

- In 2006 seat belt usage by adult occupants of pickup trucks in fatal crashes was 26.5 percent points lower than that for occupants of passenger cars.
- Pickup truck adult occupants have a lower seat belt usage than passenger cars and sport utility vehicles (SUV's) in crashes regardless of the level of injury.
- The seat belt usage for adult occupants of SUV's in fatal crashes was 10.3 percentage points lower than for occupants of passenger cars in fatal crashes.

Adult Occupant Seat Belt Usage Percent Belted in Fatal Crashes, 2006



Seat Belt Usage by Vehicle Type
Number and Percent Belted

	Passenger Car		Sport Utility Vehicle		Pickup Truck	
	2000	2006	2000	2006	2000	2006
Uninjured						
Occupants	308,290	304,454	51,658	91,749	81,874	86,319
Belted	299,025	297,882	50,413	89,850	75,297	81,684
Percent Belted	97.0	97.8	97.6	97.9	92.0	94.6
Minor						
Occupants	52,773	48,286	6,229	11,695	9,058	9,068
Belted	50,592	46,846	5,936	11,288	7,855	8,105
Percent Belted	95.9	97.0	95.3	96.5	86.7	89.4
Moderate						
Occupants	15,061	12,872	2,468	4,020	4,418	4,316
Belted	12,489	11,281	2,040	3,388	2,836	2,884
Percent Belted	82.9	87.6	82.7	84.3	64.2	66.8
Serious						
Occupants	2,374	2,311	416	619	771	780
Belted	1,673	1,782	230	419	337	385
Percent Belted	70.5	77.1	55.3	67.7	43.7	49.4
Killed						
Occupants	669	608	112	186	229	255
Belted	327	311	37	76	45	63
Percent Belted	48.9	51.2	33.0	40.9	19.7	24.7

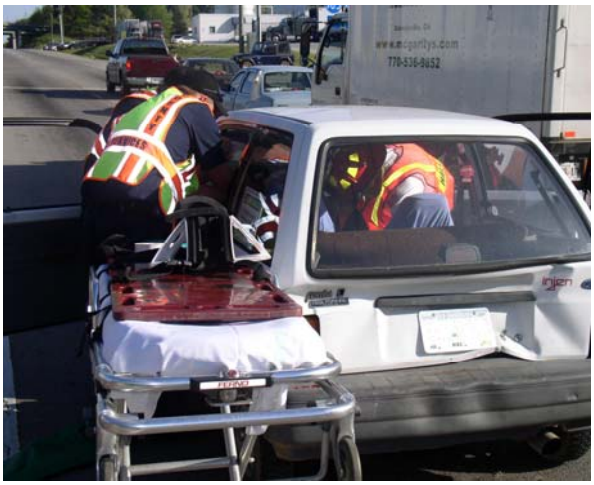
*Seat belt use as noted by law enforcement officers on the crash report for persons over age 5

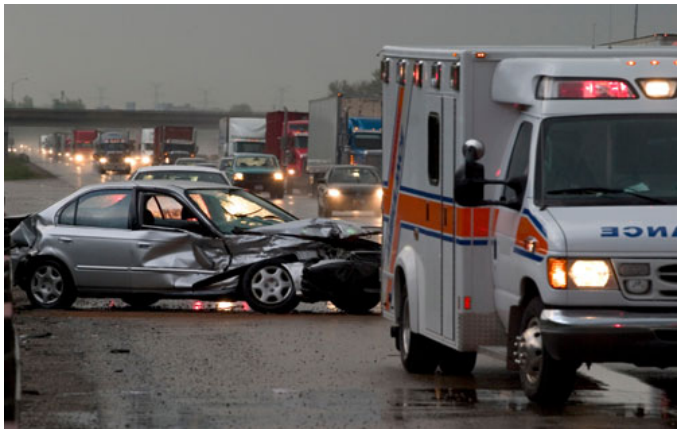
- From 2000 to 2006, seat belt usage increased for all three vehicle types regardless of severity of injury.
- The greatest increase in seat belt usage overall from 2000 to 2006 was for pickup truck and SUV occupants.
- The second greatest increase in seat belt usage in crashes was for SUV occupants.

It is imperative once a crash has occurred to have EMS at the scene, immediate initial assessment and treatment saves lives. Airway assessment and clearing, cardiac evaluation and treatment and spinal immobilization on a back board are only a few of the emergency procedures that reduce death or disability. Proper emergency care reduces the chances of an injury becoming worse and reduces the risk of adverse complications later. EMS is essential.

EMS is called to almost every crash in Georgia, that adds up to thousands of EMS calls each year for the almost 14,000 medics and 1,800 ambulances.

The very people that we rely on to aid the injured, provide consolation to people under great stress, take injured people to safety and treatment, save lives in jeopardy and document all of this activity for later analysis can become crash victims themselves.





Ambulances carry vital life saving equipment but that equipment in a crash can take the life of a medic.

A very real risk in a crash is injury to the medics from heavy equipment falling on them as they treat an injured patient or if unrestrained being thrown against the compartment or heavy equipment.

This photo is highly stylized but it represents very often how emergency medical services (EMS) must respond to a crash.

The ambulance is in itself a high risk vehicle. They are top heavy which lends to rollover. They must of necessity travel at higher speeds than the roadway was designed for. Each road has a maximum design speed and exceeding it increases the risk of a crash.

For EMS every call amounts to high risk and the risk is multiplied many times on high risk roads.

- All vehicles must move over, stop or slow down and give emergency vehicles the right of way but unfortunately not all drivers obey the law or understand the risks. Many drivers are unaware that they are not only breaking the law when they fail to yield, their irresponsible behavior could cost someone's life –maybe their own.

- In the 286 ambulance crashes in 2006, the most frequent contributing factor was failure to yield by the other vehicle in the crash.

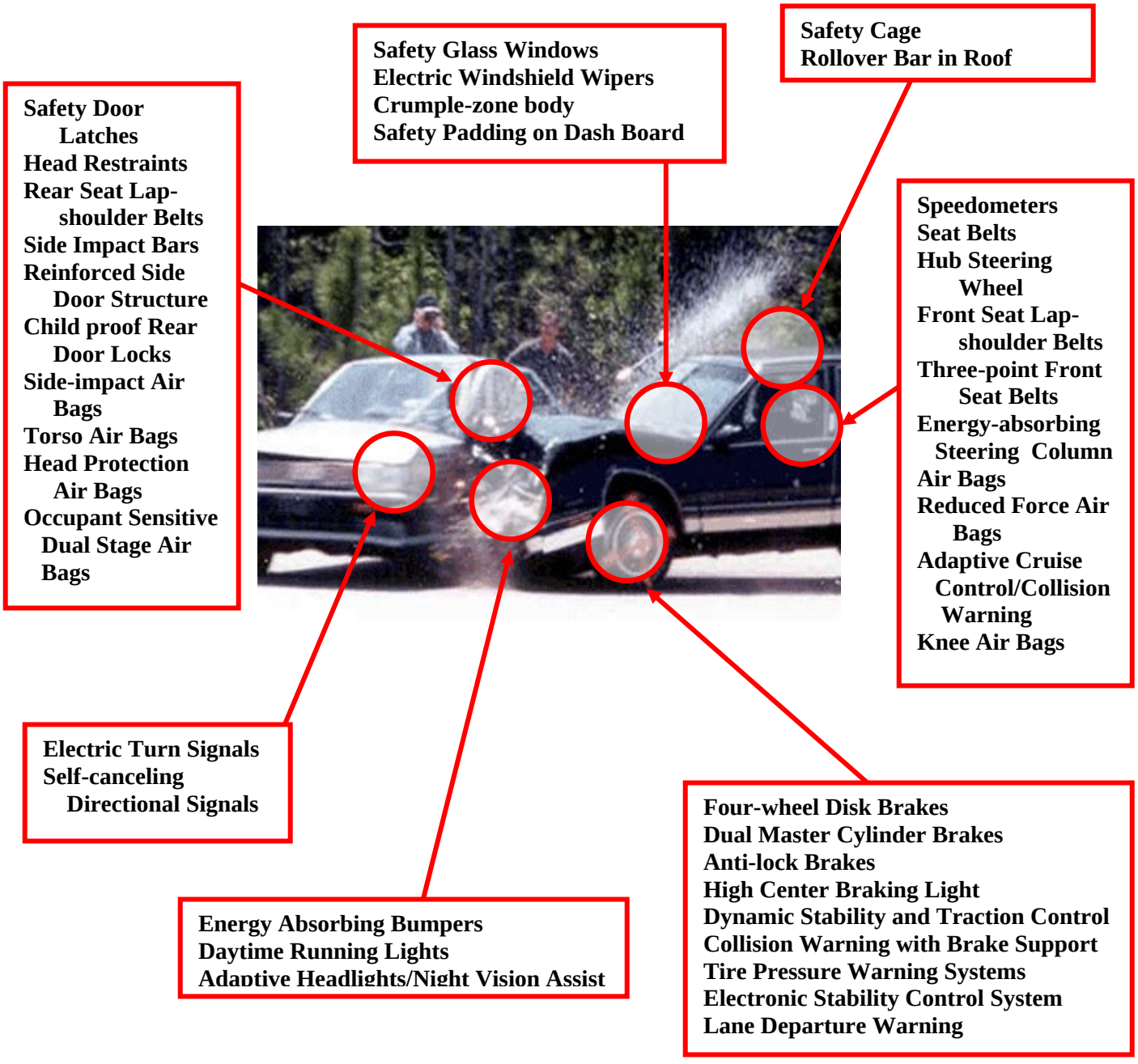
- Ambulances were involved in 286 motor vehicle crashes, 21.3 percent resulted in an injury and in 1.0 percent someone was killed.

- In the crashes where someone was injured or killed two-thirds involved a contributing factor attributed to the driver of the other vehicle.

Ambulances Involved in Motor Vehicle Crashes, 2000-2006

	2000 Crash	2001 Crash	2002 Crash	2003 Crashes	2004 Crashes	2005 Crashes	2006 Crashes	2000-2006
Crashes	280	272	288	263	324	337	286	2,050
Nonfatal Injury Crashes	58	64	73	55	86	69	61	466
Fatal Crashes	0	2	3	2	0	1	3	11

Hundreds of vehicle improvements have been made to reduce the risk of injury to the occupants, reduce the severity of injury and reduce the crash risk altogether.



A complete list of all the vehicle improvements is beyond the scope of this document. Only a fraction of the risk reduction improvements can be covered here.

Speedometers, 1914
Safety Glass Windows, 1924
Electric Windshield Wipers, 1925
Electric Turn Signals
Self-canceling Directional Signals
Safety Cage, 1944
Four-wheel Disk Brakes
Seat Belts
Crumple-zone body, 1951
Safety Padding on Dash Board, 1954
Safety Door Latches
Hub Steering Wheel
Front Seat Lap-shoulder Belts, 1959
Dual Master Cylinder Brakes, 1962
Childproof Rear Door Locks
Rear Window Defroster, 1966
Rollover Bar in Roof
Three-point Front Seat Belts
Energy-absorbing Steering Column
Head Restraints, 1968
Energy Absorbing Bumpers, 1974
Air Bags
Anti-lock Brakes, 1985
High Center Braking Light, 1985
Rear Seat Lap-shoulder Belts, 1986
Side Impact Bars, 1991
Reinforced Side Door Structure
Side-impact & Torso Air Bags, 1994
Daytime Running Lights, 1995
Reduced Force Air Bags, 1998
Dynamic Stability/Traction Control
Head Protection Air Bags
Rearview Camera/Parking Sensors
Collision Warning with Brake Support
Adaptive Cruise Control/Collision Warning
Electronic Stability Control System
Adaptive Headlights/Night Vision
Occupant Sensitive Dual Stage Air Bags
Knee Air Bags
Lane Departure Warning
Tire Pressure Warning Systems, 2008
This list is in general chronological order

There is no doubt that the risk reduction improvements in vehicles prevent crashes and save lives, but by how many lives is a different question. It is difficult to determine exactly how many lives were saved by any single one of these risk reduction vehicle engineering advancements. Many were actually put in general use over a period of years gradually in all types of vehicles. The more recent improvements will take years before they are in all new vehicles sold. The sometimes slow addition of improvements is not just about money it is about determining how effective the design is and if it has adverse consequence.

Crashes are complex unique events. The diverse factors that contribute in a crash or determine how serious the injury range from the type of collision, vehicle design and weight, the road type and if it has any separation, proximity to EMS and a trauma center, weather conditions, night visibility, vehicle weight, occupant age, weight and gender and a host of other possible reasons. Trying to replicate exactly complex real life crash conditions in a laboratory is next to impossible but methods for crash testing are changing constantly and improving.

Georgia Fatalities	
1940	838
1945	676
1950	905
1955	1,088
1960	1,038
1965	1,364
1966	1,605
1967	1,622
1968	1,790
1969	1,806
1970	1,802
1971	1,799
1972	1,896
1973	1,912
1974	1,545
1975	1,387
1976	1,289
1977	1,460
1978	1,490
1979	1,523
1980	1,503
1981	1,418
1982	1,229
1983	1,296
1984	1,410
1985	1,362
1986	1,542
1987	1,604
1988	1,660
1989	1,632
1990	1,564
1991	1,393
1992	1,324
1993	1,407
1994	1,437
1995	1,492
1996	1,582
1997	1,584
1998	1,579
1999	1,514
2000	1,549
2001	1,656
2002	1,531
2003	1,610
2004	1,641
2005	1,745
2006	1,703

The Risk –Side Impact

Crashes that occur at an angle account for 25.5 percent of the fatal crashes in Georgia in 2006. From 2000 to 2006 there have been 2,618 fatal crashes in Georgia.

When a vehicle is struck from the side the force of impact causes creates a tremendous sideways force on the vehicle occupants. The degree can be measured by intrusion of the striking vehicle. The sharp snap that the head and neck receive in a side impact crash can cause serious permanent injury to the neck and spine and can also cause the aorta to tear leading to death. On the left is a list of vehicle improvements that are designed to reduce the risk of a crash and the risk of injury if a side impact crash occurs.

The structure of the vehicle is an important factor in side impact crashes. Reinforced doors and crumple-zone vehicle body reduces the risk of injury to the occupants. At the same time disparity in vehicle size can override the risk reduction factors of the respective vehicles. Vehicle speed is also a factor. High enough excess or unsafe speed can off set the protective effects of any device designed to reduce injury risk.

Newer innovations such as side impact, torso or head airbags provide even greater protection especially in the side impact crash. While most of these air bags were designed for the average adult it is thought that the torso air bags also protect even young children.

Reducing the Risk:

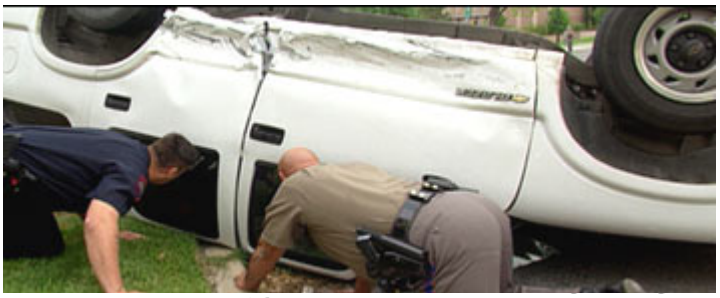
Energy Absorbing Bumpers
Seat Belts
Hub Steering Wheel
Front Seat Lap-shoulder Belts
Three-point Front Seat Belts
Energy-absorbing Steering Column
Air Bags
Head Restraints
Reduced Force Air Bags
Adaptive Cruise Control/Collision Warning
Knee Air Bags
Safety Door Latches
Head Restraints
Rear Seat Lap-shoulder Belts
Side Impact Bars
Reinforced Side Door Structure
Side Impact & Torso Air Bags
Head Protection Air Bags
Occupant Sensitive Dual Stage Air Bags
Safety Glass Windows
Crumple-zone body
Safety Padding on Dash Board

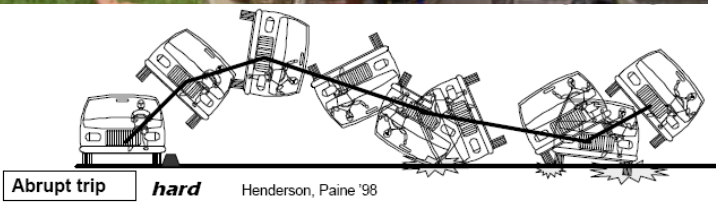
Another air bag improvement is the occupant dual stage air bags that sense and adjust across the spectrum of occupant weight and height.

In spite of all the risk reduction devices listed above it is absolutely essential that seat belts be used. They are a vital part of the arsenal we have to protect ourselves on the road. Regardless of crash type seat belts really do save lives.

The Risk –Rollover Crashes

From 2000 to 2006 there has been a steady increase in rollover crashes. The number of fatal rollover crashes went from114 in 2000 to 161 in 2006.





As with other serious crashes vehicle structure and body strength play an important role in preventing injuries. In rollover crashes the unrestrained unprotected occupant can be thrown at a violent force against the roof and sides of the vehicle. In other circumstances the occupant can be totally or partially ejected from the vehicle.

The type and severity of injury in a rollover crash depend on a number of factors including the vehicles tendency to overturn, speed of the vehicle and many other reasons. For many vehicles with a narrow wheel base and higher vehicle body the tendency to rollover is significant. Addition of dynamic stability and traction control systems is proving to be a major factor in reducing the rollover risk in these vehicles. Newer braking systems are also important in ensuring better vehicle control.

As with other type of serious crashes air bags provide significant protection against injury. Most air bags that are designed for a frontal impact deflate almost immediately but a rollover crash may last multiple seconds depending on how many times the vehicle rolls over. Side, torso and curtain airbags are designed to deflate more slowly thus allowing greater protection. In addition as they cover the side windows they offer some protection against ejection from the vehicle.

Reducing the Risk:

Safety Cage
Rollover Bar in Roof
Four-wheel Disk Brakes
Dual Master Cylinder Brakes
Anti-lock Brakes
Dynamic Stability and Traction Control
Collision Warning with Brake Support
Tire Pressure Warning Systems
Electronic Stability Control System
Lane Departure Warning
Speedometers
Seat Belts
Hub Steering Wheel
Front Seat Lap-shoulder Belts
Three-point Front Seat Belts
Energy-absorbing Steering Column
Air Bags
Reduced Force Air Bags
Adaptive Cruise Control/Collision Warning
Knee Air Bags
Safety Door Latches
Head Restraints
Rear Seat Lap-shoulder Belts
Side Impact Bars
Reinforced Side Door Structure
Side-impact & Torso Air Bags
Head Protection Air Bags
Occupant Sensitive Dual Stage Air Bags
Safety Glass Windows
Crumple-zone body
Safety Padding on Dash Board

The Past –Before 1971

The Present -2008

There is a tendency for all of us to feel safe in our cars and trucks. That tendency is an illusion.

Each of the vehicles pictured on the left promises safety, comfort and excellent performance engineering. The 1971 Monte Carlo with its weight and steel frame offers very real protection to its occupants despite the lack of risk reduction improvements found in newer vehicles. Its interior is spacious and with its solid construction it *feels* safe.

The newer vehicles of today possess an array of features that reduce the risk of crashing and in the event of a crash offer a multitude of devices that reduce the risk of injuries. They handle better and you can hardly feel the road unlike older models.

But they also pose a risk: a false sense of security. That false sense of security can make us forget the real risks out there on the road and insulate us so that we may tend to drive a little faster and take a few more chances that we would not take in a less 'safe' vehicle.

In addition every improvement may pose a risk of its own. Anti-lock brakes are a fundamental improvement but if the vehicle goes off road and hits soft dirt it can be misinterpreted as the brakes locking. Subsequently the anti-lock brakes will automatically reduce braking and thus the stopping distance may decline by as much as 10 to 20 feet –a critical distance when at higher speeds approaching a fixed object.

In any attempt to reduce risk it is important to tailor the fix to the individual circumstance. Air bags were originally thought to be safe for everyone but they were found to be a risk to shorter occupants. Newer air bags now have the ability to sense the occupant's weight and size and adjust accordingly. One size does not fit all and each of the improvements must be almost 'designer' safety devices. In emergency medical services it is always preached 'Treat the patient' as a warning that in spite of all the standard medical knowledge each patient is unique, motor vehicle crashes are no different.

In spite of all the progress that has been made there is still much to learn. Total safety is an illusion. There are no risk free vehicles.

Although risk can be measured in many ways the proportion of crashes that result in a fatality may be the most straight forward. High risk vehicles result in a higher proportion of fatal crashes than other vehicles. When high risk vehicles are driven on high risk roads such as those often found in rural counties the risk is compounded many times.

In 2006, one out of three fatalities in Georgia occurred in a crash involving a pickup truck.

A higher proportion of pickup crashes were fatal. The proportion of pickup truck crashes that were fatal was almost twice that of passenger cars.

In 2006, one out of six fatalities in Georgia occurred in a crash involving a large truck.

The proportion of large truck crashes that were fatal was almost four times greater than that of passenger cars.

In 2006, almost one out of 10 fatalities in Georgia occurred in a crash involving a motorcycle.

The proportion of motorcycle crashes that were fatal was twelve times greater than that of passenger cars.

The vast majority of fatal crashes occur on non-interstate roads regardless of vehicle type. Almost nine out of ten fatal crashes occur on non-interstate roads. Non-interstate roads are often not as well engineered and may have frequent entering and exiting traffic which greatly increases the risk of a crash.

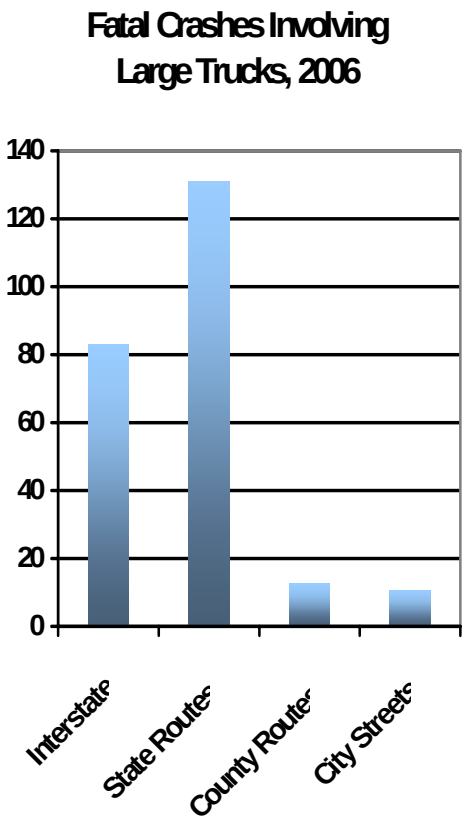
State routes accounted for the highest proportion of fatal crashes for passenger cars, pickup trucks, large trucks and motorcycles.

Interstates and city streets accounted for the smallest proportion of fatal crashes involving passenger cars, pickup trucks and motorcycles about one out of ten for all three vehicle types.

Of the 238 large trucks involved in fatal crashes 83 were in crashes on interstates – one third of the fatal crashes involving large trucks.

A greater proportion of large truck fatal crashes occurred on state routes. Over half of the fatal crashes involving large trucks were on state routes. Greater large truck travel may account for the high proportion of fatal crashes on interstates and state routes in addition to the higher speeds and the difficulty in stopping and maneuvering large trucks.

The smallest proportion of fatal crashes was on city streets for passenger cars, pickup trucks and large trucks. Only for motorcycles was the proportion of fatal crashes higher on city streets than interstates.



Fatal Crashes by Vehicle Type
Interstate and Non-Interstate Roads, 2006

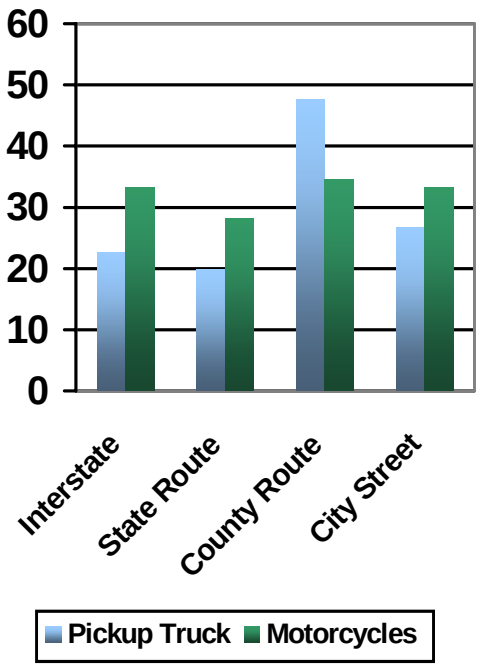
	Passenger Car		Pickup Truck		Large Truck		Motorcycle*	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Interstate	140	13.5	57	11.2	83	34.9	15	9.6
State Route	477	46.1	266	52.1	131	55.0	60	38.2
County Route	297	28.7	147	28.8	13	5.5	58	36.9
City Street	121	11.7	41	8.0	11	4.6	24	15.3
Total	1,035	100.0	511	100.0	238	100.0	157	100.0

*Includes motorcycles and minibikes

Off road fatal crashes accounted for 41 percent of all fatal crashes in Georgia in 2006. For all vehicle types the highest proportion of run off road fatal crashes was on county routes.

Almost half of the fatal crashes on county routes involving passenger cars and pickup trucks were run off road crashes.

Off Road Fatal Crashes
Road and Vehicle Type, 2006
Percent Off Road



Off Road Fatal Crashes
by Road and Vehicle Type, 2006
Number and Percent Off Road

	Total Number	Off Road Number	Off Road Percent
Passenger Car			
Interstate	140	33	23.57
State Route	477	118	24.74
County Route	297	138	46.46
City Street	121	30	24.79
Total	1,035	319	30.82
Pickup Truck			
Interstate	57	13	22.81
State Route	266	53	19.92
County Route	147	70	47.62
City Street	41	11	26.83
Total	511	147	28.77
Large Truck			
Interstate	83	17	20.48
State Route	131	10	7.63
County Route	13	5	38.46
City Street	11	1	9.09
Total	238	33	13.87
Motorcycle*			
Interstate	15	5	33.33
State Route	60	17	28.33
County Route	58	20	34.48
City Street	24	8	33.33
Total	157	50	31.85

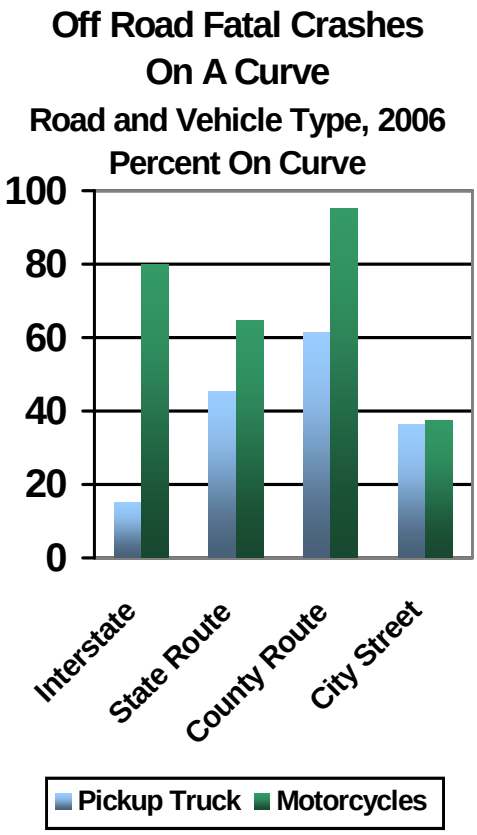
*Includes motorcycles and minibikes

For passenger cars and pickup trucks one out of four interstate fatal crashes was a run off road crash compared with almost one out of two fatal crashes on county routes.

Large trucks showed a different pattern compared with passenger cars and pickup trucks. A little over one out of three fatal crashes involving large trucks on county routes was an off road crash.

Motorcycles demonstrated yet another pattern. For all types of road, about one out of three fatal crashes involved running off the roadway.

Off road crashes are more often fatal because of the high risk for rollover or hitting a fixed object both result in more serious injuries and deaths.



In 2006, one out of two fatal off road crashes happened on a curve although straight roadway segments far outnumber curved roadway segments.

For many narrow roads the edges of the road are easy to slip off of and the road edge drop off is very deep causing loss of control when vehicles try to return to the roadway and the vehicle swerves either into oncoming traffic or off the road into a post or tree.

Horizontal curves are one of the major road characteristics that increase the risk of crashing. Almost half of the fatal off road crashes involving pickup trucks on state routes occurred on a curve.

On county routes six out of ten fatal off road crashes involving pickup trucks occurred on a curve.

For large trucks almost one-third of the fatal off road crashes on state routes was on a curve. For county routes the proportion was the same as for pickup trucks. Six out of ten fatal off road crashes involving large trucks on county routes occurred on a curve.

A different pattern appears for fatal motorcycle crashes. The vast majority of fatal off road crashes involving motorcycles on interstates and county routes occurred on a curve.

Vehicles in Off Road
Fatal Crashes on a Curve, 2006
Number of Vehicles and Percent

	Off Road Number	On Curve Number	On Curve Percent
Passenger Car			
Interstate	33	7	21.21
State Route	118	59	50.00
County Route	138	86	62.32
City Street	30	10	33.33
Total	319	162	50.78
Pickup Truck			
Interstate	13	2	15.38
State Route	53	24	45.28
County Route	70	43	61.43
City Street	11	4	36.36
Total	147	73	49.66
Large Truck			
Interstate	17	4	23.53
State Route	10	3	30.00
County Route	5	3	60.00
City Street	1	0	0.00
Total	33	10	30.30
Motorcycle			
Interstate	5	4	80.00
State Route	17	11	64.71
County Route	20	19	95.00
City Street	8	3	37.50
Total	50	37	74.00

*Includes motorcycles and minibikes

Almost half of the fatal crashes involving pickup trucks occurred in rural counties.

For crashes overall one out of three involved pickup trucks in the five Atlanta metropolitan counties. In contrast only about one out of ten fatal pickup truck crashes happened in those urban counties.

Pickup Trucks in Crashes by Region, 2006
Number and Percent

	Passenger Car		Pickup Truck	
Crashes	Number	Percent	Number	Percent
Atlanta	186,125	50.4	34,497	34.3
Suburbs	47,837	12.9	18,997	18.9
Other MSA	70,508	19.1	19,621	19.5
Rural	65,191	17.6	27,522	27.3
GEORGIA	369,661	100.0	100,637	100.0
Non-Fatal Injury Crashes				
Atlanta	43,393	45.8	7,455	29.0
Suburbs	13,394	14.1	5,078	19.7
Other MSA	18,126	19.1	4,841	18.8
Rural	19,747	20.9	8,377	32.5
GEORGIA	94,660	100.0	25,751	100.0
Fatal Crashes				
Atlanta	304	29.4	70	13.7
Suburbs	164	15.8	110	21.5
Other MSA	203	19.6	93	18.2
Rural	364	35.2	238	46.6
GEORGIA	1,035	100.0	511	100.0

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

Regardless of the type of crash or vehicle, rural counties have more fatal crashes than urban areas.

In rural counties, 62.2 percent of the fatal crashes were off road crashes and of those 49.7 percent were on a curve.

The proportion of pickup trucks in rollover crashes is twice that of passenger cars. The difference is even greater in fatal crashes. Rollover crashes account for one out of ten fatal crashes for passenger cars. In comparison one out of five fatal pickup truck crashes are rollover crashes.

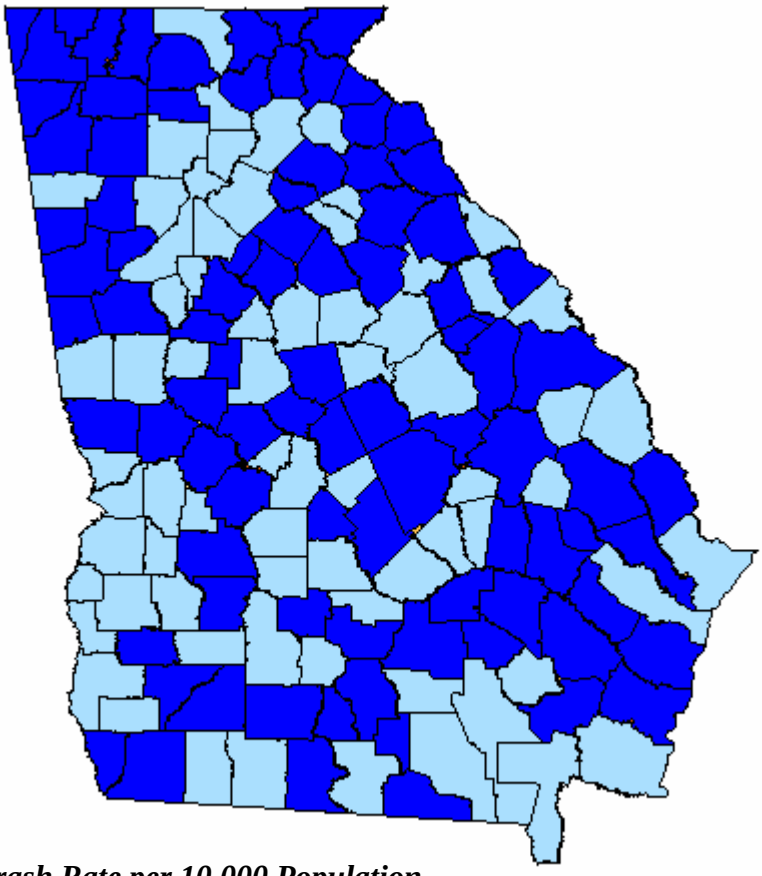
Rural counties accounted for 47 of the 78 fatal rollover crashes involving pickup trucks.

Almost one-third of the fatal crashes involving pickup trucks occurred on a curve. Of those fatal crashes over one-half were in rural counties.

The number of pickup trucks in fatal crashes increased 17 percent from 2000 to 2006. Even when adjusted for the increase in the number of registered vehicles the fatal crash rate increased 5.7 percent.

The vast majority of fatal crashes involving pickup trucks occurred in rural counties. These rural counties have a fatality rate higher than the fatal crash rate for Georgia overall.

Counties with a fatality rate higher than the state fatality rate are in dark blue. In other words the highest risk of being killed in a pickup truck crash is in the counties in dark blue.



Fatal Crash Rate per 10,000 Population

Almost half of the fatal crashes involving large trucks occurred in rural counties.

The five Atlanta metropolitan counties accounted for almost half of the crashes involving large trucks. In contrast they only accounted for about one out of five fatal large truck crashes.

Large Trucks in Crashes by Region, 2006
Number and Percent

	Passenger Car		Large Truck	
Crashes	Number	Percent	Number	Percent
Atlanta	186,125	50.4	10,548	45.1
Suburbs	47,837	12.9	3,822	16.4
Other MSA	70,508	19.1	3,412	14.6
Rural	65,191	17.6	5,584	23.9
GEORGIA	369,661	100.0	23,366	100.0
Non-Fatal Injury Crashes				
Atlanta	43,393	45.8	1,969	37.5
Suburbs	13,394	14.1	849	16.2
Other MSA	18,126	19.1	784	15.0
Rural	19,747	20.9	1,642	31.3
GEORGIA	94,660	100.0	5,244	100.0
Fatal Crashes				
Atlanta	304	29.4	43	18.1
Suburbs	164	15.8	42	17.6
Other MSA	203	19.6	40	16.8
Rural	364	35.2	113	47.5
GEORGIA	1,035	100.0	238	100.0

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

Crashes between large trucks and smaller vehicles are deadly. Over 86 percent of the people killed in large truck crashes were occupants of the smaller vehicle.

The majority of the fatal large truck crashes in 2006 involved a crash with another moving vehicle, 79.4 percent compared with 57.2 percent for passenger cars.

The proportion of rollover or fixed object fatal crashes was lower for large trucks even so about half of the fatal crashes involving large trucks happened in rural counties.

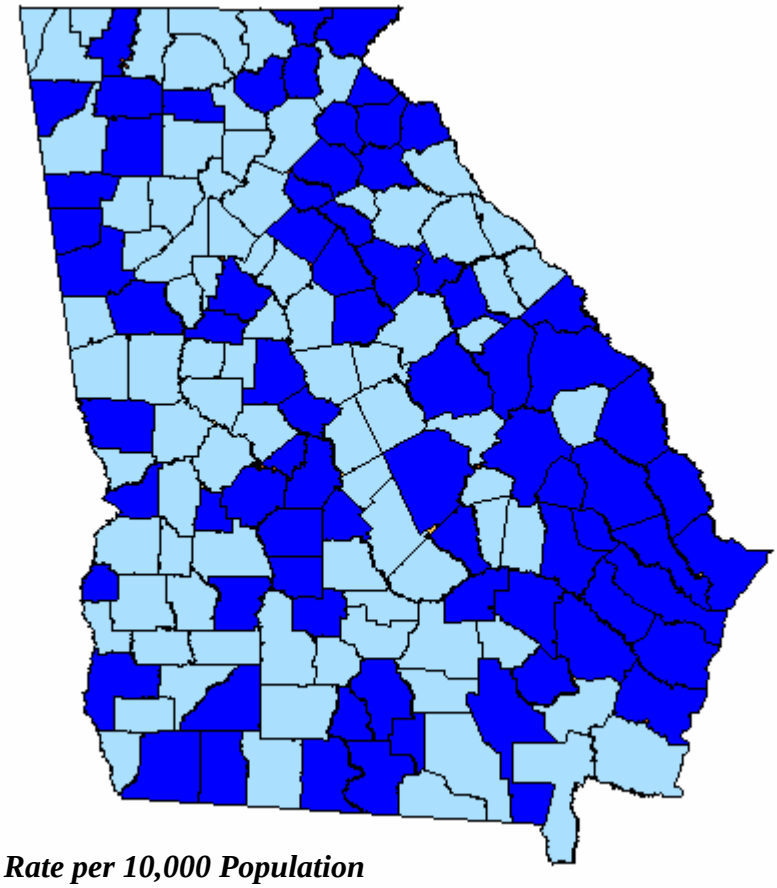
In non-fatal injury crashes 37.5 percent occurred in the five Atlanta metropolitan counties with their high congestion and large number of passenger vehicles and trucks.

As for passenger cars, pickup trucks and motorcycles the smallest proportion of fatal crashes was in suburban and other MSA counties.

From 2000 to 2006, fatal crashes involving large trucks increased 12.26 percent. In 2006 fatalities involving large trucks represented almost one out of six fatalities in Georgia.

The majority of fatal crashes involving large trucks occurred in rural counties. These rural counties have a fatality rate higher than the fatal crash rate for Georgia overall.

Rural counties along the high traffic I-75 corridor and the I-95 corridor along the east coast have a higher large truck fatality rate than for Georgia overall.



Fatal Crash Rate per 10,000 Population

Counties with a fatality rate higher than the state fatality rate are in dark blue. In other words the highest risk of being killed in a crash with a large truck is in the counties in dark blue.

Almost one-third of the fatal motorcycle crashes occurred in rural counties.

Unlike passenger cars for motorcycles a higher proportion of crashes occur in rural counties. Thirty percent of the motorcycle crashes happened in rural counties compared with 17.6 percent for passenger cars.

Motorcycles in Crashes by Region, 2006*
Number and Percent

	Passenger Car		Motorcycle	
Crashes	Number	Percent	Number	Percent
Atlanta	186,125	50.4	1,200	28.7
Suburbs	47,837	12.9	814	19.5
Other MSA	70,508	19.1	912	21.8
Rural	65,191	17.6	1,254	30.0
GEORGIA	369,661	100.0	4,180	100.0
Non-Fatal Injury Crashes				
Atlanta	43,393	45.8	786	26.4
Suburbs	13,394	14.1	606	20.4
Other MSA	18,126	19.1	633	21.3
Rural	19,747	20.9	949	31.9
GEORGIA	94,660	100.0	2,974	100.0
Fatal Crashes				
Atlanta	304	29.4	41	26.1
Suburbs	164	15.8	30	19.1
Other MSA	203	19.6	37	23.6
Rural	364	35.2	49	31.2
GEORGIA	1,035	100.0	157	100.0

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

*Includes motorcycles and minibikes

Motorcyclists are at greater risk of being injured or killed in motor vehicle crashes. Almost three out of four motorcyclists were either injured or killed in crashes in 2006 compared with one out of six for passenger cars.

Almost one out of three injury motorcycle crashes occurred in rural counties compared with one out of five for passenger cars.

In 2006, rollover crashes accounted for 69 percent of the fatal motorcycle crashes in rural counties. In comparison no fatal motorcycle rollover crashes occurred in the five Atlanta metropolitan counties.

One-third of the fatal crashes involving motorcycles involved running off the roadway.

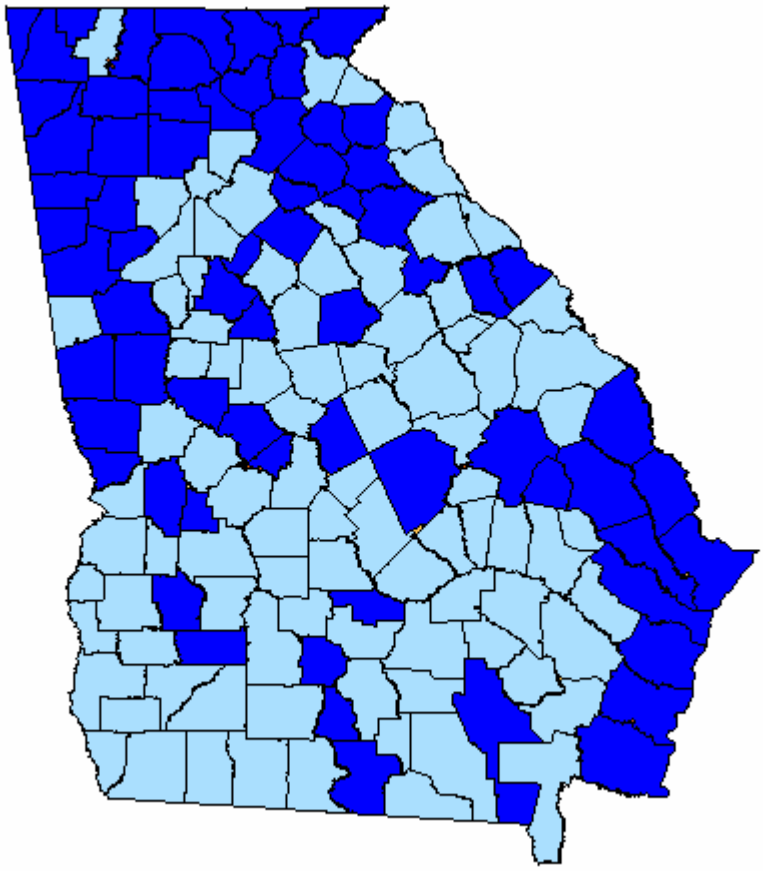
Of the 157 fatal motorcycle crashes in 2006, 69 or 44 percent occurred in rural counties on a curve compared with 26 percent for fatal crashes involving passenger cars.

The increase in the fatality rate for motorcycle crashes was more than double the increase for motorcycle crashes and injury crashes. The motorcycle fatal crash rate increased 60.76 percent from 2000 to 2006.

The majority of injury crashes involving motorcycles occurred in rural northern counties and along the coast. These rural counties have an injury rate higher than the injury crash rate for Georgia overall.

The northern counties with their winding country roads are desirable recreational roads for motorcyclists. The challenge of the curves and hills is what attracts motorcyclists and also at the same time what increases the risk. The high coastal motorcycle traffic along I-95 leading down to Daytona Florida where many motorcycle activities occur may account for the higher fatality rate in those rural counties.

Counties with an injury crash rate higher than the state injury crash rate are in dark blue. In other words the highest risk of being in a motorcycle injury crash is in the counties in dark blue. The injury rate here includes all injuries including fatal injuries.



Injury Crash Rate per 10,000 Population

Vehicles on High Risk Roads

Regardless of the type of vehicle, rural counties have more fatalities than urban areas. Rural counties accounted for 41.9 percent of the fatal crashes involving another vehicle, 49.6 percent of the fatal fixed object crashes and 62.2 percent of the fatal roll over crashes although they accounted for only 37 percent of the vehicle travel in the state.

Proportionally more occupants of pickup trucks were killed in crashes than cars and SUV's and almost half of the fatal crashes involving pickup trucks occurred in rural counties.

Rural counties accounted for 60 percent of the fatal rollover crashes involving pickup trucks.

Over 86 percent of the people killed in large truck crashes were occupants of the smaller vehicle.

Almost half of the fatal crashes involving large trucks occurred in rural counties.

The proportion of rollover fatal crashes was lower for large trucks. Even so about half of the fatal crashes involving large trucks happened in rural counties.

Almost one-third of the fatal motorcycle crashes occurred in rural counties.

Of the 157 fatal motorcycle crashes in 2006, 44 percent occurred in rural counties on a curve compared with 26 percent for fatal crashes involving passenger cars.

Risk and the People…..
Section IV

***C*rash *A*nalysis, *S*tatistics & *I*nformation**

Georgia Department of Transportation **January 2008**

Risk and the People….. *Section IV*

To estimate risk or measure the reduction of risk we only have the quantitative crash data that gives us generalizations. We do not have data on near misses or crashes that would have happened if for example the driver had been paying attention and swerved at the last moment. But we do have additional information from the personal accounts of individuals, law enforcement officers and emergency medical technicians at the crash scene. This qualitative information is extremely valuable in understanding the risk. As a way of harvesting that qualitative information we have included accounts from emergency medical technicians and law enforcement officers. Their stories help bring all of the data into perspective and literally tell a story of life and death on our roads.

Connections…..

The Crash Report

'Vehicle was traveling north and failed to negotiate a curve. Vehicles tires gouged into soft dirt causing the vehicle to overturn several times.
The vehicle came to rest 42 feet off the roadway.
The unbelted male driver was ejected from the vehicle and came to rest 65 feet from the vehicle.
Belted adult female passenger sustained moderate injuries and two young children who were in child safety seats had only minor injuries.'
-Law Enforcement Officer and EMS on scene.

Crash report narrative is taken from crash reports by Georgia law enforcement officers. Photographs are purely for descriptive purposes and are not from the crash scene.

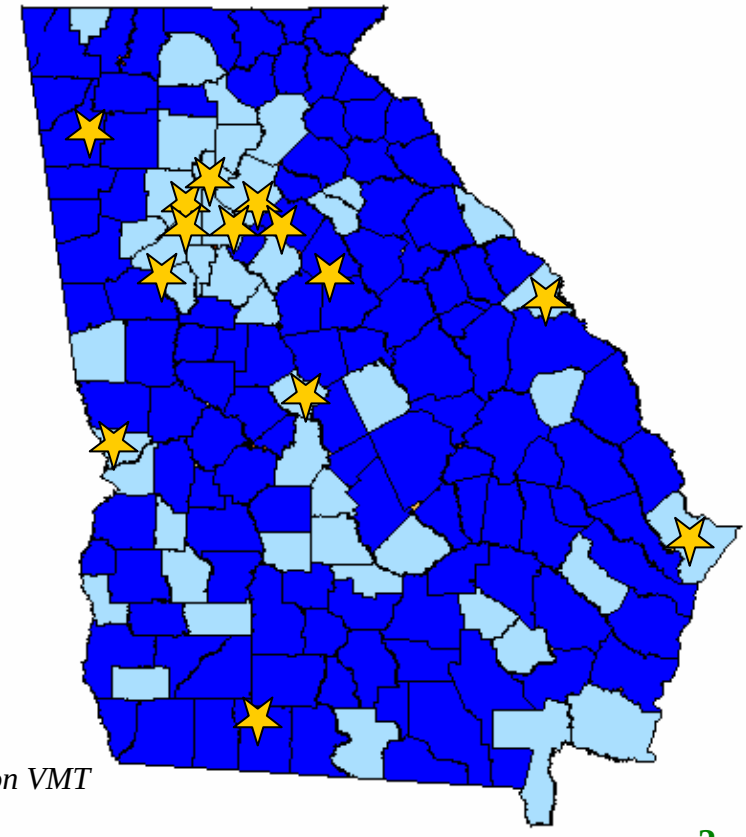
It's all about the risk we face on the roads and from the map below it is clear there is a much higher risk in rural counties. There are many reasons for the higher risk in rural areas and the lack of trauma centers increases the already high risk. When a serious injury occurs immediate emergency care can mean life or death.

From 2000 to 2006, 47,044 people received serious, incapacitating injuries such as traumatic head injuries, paralysis, internal bleeding or other severe injuries.

Crashes that occurred from 2000 to 2006 resulted in 225,963 moderate injuries including fractured ribs, dislocated shoulders, lacerations and broken protruding fractures.

Counties with a fatality rate higher than the state fatality rate are in dark blue. In other words the highest risk of being killed in a crash is in the counties in dark blue.

Trauma centers are noted by the gold stars. The majority are in the Atlanta area with very few in the rural counties of Georgia and those are the counties with the higher fatality rates.



2000-2006 Fatal Crash Rate per 100 Million VMT

Almost one million men, women and children were injured in motor vehicle crashes in Georgia from 2000 to 2006. Over that seven year period crashes resulted in more than 2,500 injuries on average each week.

- For many age groups the number of injuries has declined from 2000 to 2006. However the number of injuries increased for persons aged 45-74, ages 21-24 and children under age five.
- From 2000 to 2006, 84,950 young children under age 15 were injured. On average 234 young children were injured each week.
- For teenagers ages 15-19 the number is even greater with 126,499 teens ages 15-19 injured from 2000 to 2006. On average each week 348 teens were injured in motor vehicle crashes.

Injuries by Age
Number and Rate per 10,000 Population

Ages		2000	2001	2002	2003	2004	2005	2006	2000-2006
0-4	Number	3,181	3,105	3,181	3,234	3,299	3,466	3,380	22,846
	Rate	53.2	50.1	49.9	49.3	48.9	50.1	48.1	49.9
5-9	Number	4,152	4,037	4,099	3,994	4,100	4,121	3,839	28,342
	Rate	67.5	65.4	66.2	64.3	65.3	64.4	57.8	64.3
10-14	Number	5,000	4,868	4,879	4,925	4,964	4,699	4,427	33,762
	Rate	81.6	77.1	75.5	74.9	74.8	70.8	66.2	74.3
15-19	Number	18,255	18,241	18,220	17,733	18,122	18,299	17,629	126,499
	Rate	304.5	305.1	302.4	289.9	287.2	279.0	260.3	289.1
20-24	Number	17,930	17,803	18,319	18,514	19,091	19,064	18,320	129,041
	Rate	299.2	283.7	282.9	285.8	291.0	292.3	279.1	287.6
25-34	Number	27,141	27,250	26,579	26,776	27,814	27,772	25,939	189,271
	Rate	208.7	208.1	201.6	202.2	207.5	205.0	188.6	203.0
35-44	Number	22,268	22,781	22,530	22,448	23,151	23,379	22,263	158,820
	Rate	163.9	164.9	161.8	160.4	164.0	163.5	152.9	161.6
45-54	Number	14,962	15,634	16,158	16,238	17,260	17,690	17,190	115,132
	Rate	137.0	137.0	138.4	135.4	140.0	139.1	130.7	136.7
55-64	Number	7,865	8,317	8,678	9,124	9,943	10,462	10,409	64,798
	Rate	117.8	119.8	116.2	114.9	118.3	117.8	111.3	116.4
65-74	Number	4,518	4,845	4,592	4,623	4,895	4,867	4,693	33,033
	Rate	103.6	109.4	102.1	100.6	104.3	100.1	93.1	101.7
>74	Number	3,061	3,069	3,028	3,092	3,059	3,147	2,942	21,398
	Rate	86.8	85.1	81.9	81.5	79.2	78.9	72.0	80.6

*Injury severity as noted by the law enforcement officer on the crash report.

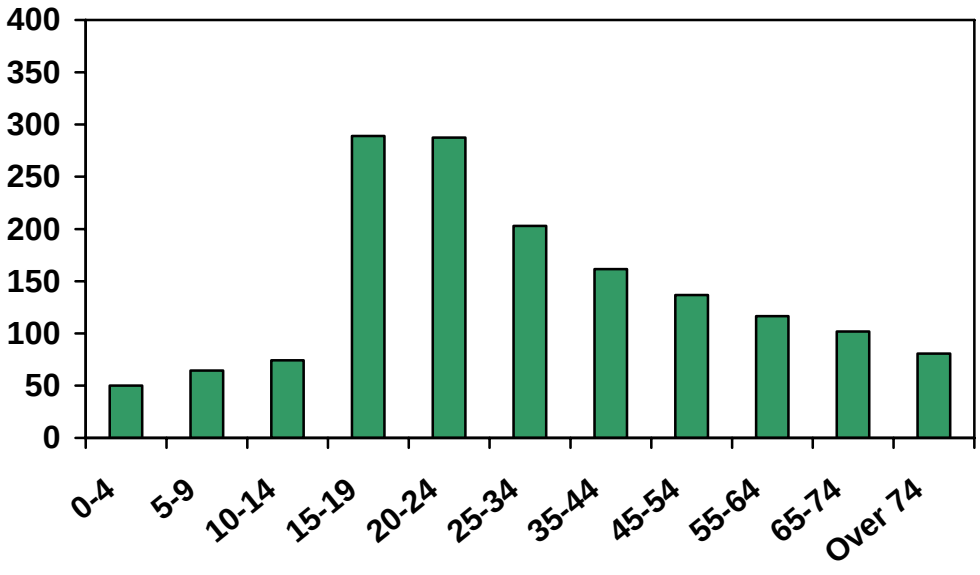
By comparing injury rates we can estimate the risk of being injured in a crash. The risk of a teenager or young adult of being injured in a crash is more than double the risk for persons ages 45-54.

- For all ages the injury rate declined from 2000 to 2006 even when the actual number of injuries increased. This is due to the increase in population that statistically offsets the increase.

- The injury rate is generally highest for teenagers and young adults and gradually declines with increasing age. The lower injury rate for older people is in stark contrast to the fatality data. The fatality rate for older persons is much higher than the fatality rate of younger people.

- The lowest injury rate was for infants and toddlers ages 0-4, a rate of 49.9 per 10,000 population. The rate for young children ages 5-9 was 22 percent higher at 64.3 per 10,000 population.

- Even higher in comparison was the rate for children ages 10-14 at 74.3 it was 49 percent higher than the rate for children ages 0-4.



Crash injuries reflect multiple opposing factors all acting at the same time. An increased population produces more people at risk yet protective behaviors such as seat belt use greatly reduce the number of people injured. Calculating a rate per 10,000 population gives us an idea of the proportional risk to a specific age group compared with another age group.

From 2000 to 2006 in Georgia, 11,435 people lost their lives in motor vehicle crashes. On average 31 people die in crashes each week.

- The number of fatalities increased for ages 0-4, 20-34, and 45-64. The largest increase in the number of fatalities was 53.6 percent for persons ages 55 to 64.
- The fatality rate increased for ages 20-24, and 45-64. The greatest increase was for persons ages 20 to 24, an increase of 17.8 percent.
- The fatality rate declined for the younger age groups. All age groups under age 20 demonstrated a decline in the fatality rate ranging from 50.1 percent for ages 10-14 to 7.4 percent for ages 0-4.

Fatalities by Age
Number and Rate per 10,000 Population

Ages		2000	2001	2002	2003	2004	2005	2006	2000-2006
0-4	Number	34	27	27	19	33	37	37	214
	Rate	0.57	0.44	0.42	0.29	0.49	0.54	0.53	0.47
5-9	Number	26	27	29	22	22	22	22	170
	Rate	0.42	0.44	0.47	0.35	0.35	0.34	0.33	0.39
10-14	Number	33	46	27	43	33	28	18	228
	Rate	0.54	0.73	0.42	0.65	0.50	0.42	0.27	0.50
15-19	Number	181	199	186	192	157	187	177	1,279
	Rate	3.02	3.33	3.09	3.14	2.49	2.85	2.61	2.92
20-24	Number	186	219	177	190	212	217	240	1,441
	Rate	3.10	3.49	2.73	2.93	3.23	3.33	3.66	3.21
25-34	Number	282	261	256	260	273	287	296	1,915
	Rate	2.17	1.99	1.94	1.96	2.04	2.12	2.15	2.05
35-44	Number	245	279	256	276	260	257	236	1,809
	Rate	1.80	2.02	1.84	1.97	1.84	1.80	1.62	1.84
45-54	Number	182	215	212	225	229	243	244	1,550
	Rate	1.67	1.88	1.82	1.88	1.86	1.91	1.86	1.84
55-64	Number	110	124	117	138	152	196	169	1,006
	Rate	1.65	1.79	1.57	1.74	1.81	2.21	1.81	1.81
65-74	Number	121	111	97	94	114	114	121	772
	Rate	2.77	2.51	2.16	2.04	2.43	2.34	2.40	2.38
>74	Number	123	127	124	122	137	140	113	886
	Rate	3.49	3.52	3.35	3.22	3.55	3.51	2.77	3.34

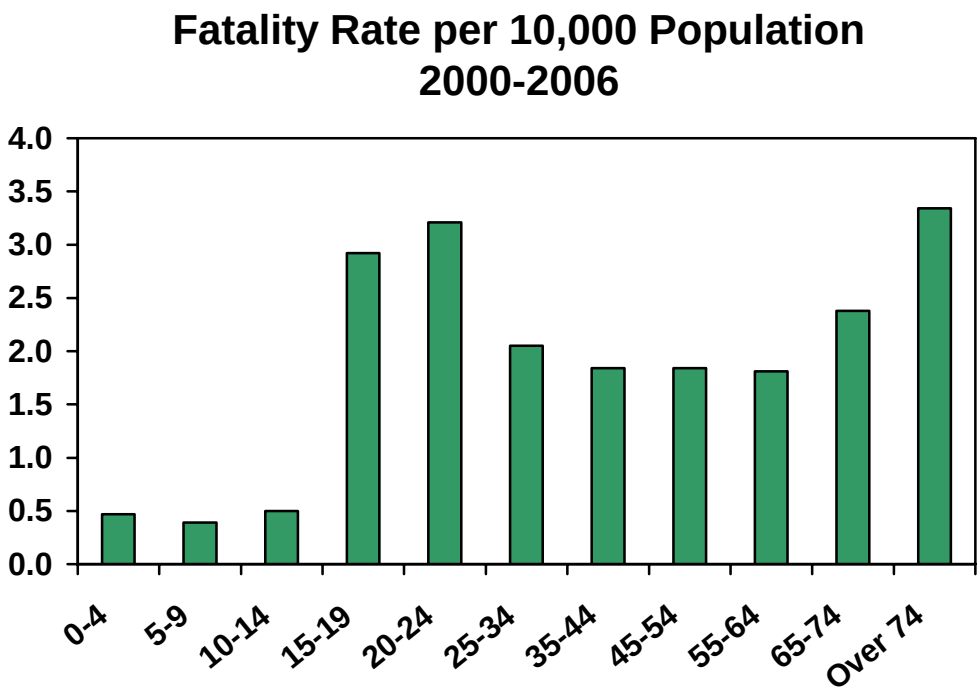
Although teens historically have been thought to have the highest fatality rate they are now third with a fatality rate of 2.9 per 10,000 population.

- The fatality rate per 10,000 population is generally high for teenagers and young adults and gradually declines with increasing age until about age 65.

- The fatality rate then begins to increase with increasing age. The highest fatality rate was for persons over age 74, 3.4 per 10,000 population. Older persons face a greater risk of injury or death in motor vehicle crashes due to a greater susceptibility to physical injury.

- The second highest fatality rate was for young adults ages 20-24, a rate of 3.2 per 10,000 population over the seven-year period from 2000 to 2006.

- The lowest fatality rate was for young children. The fatality rate for children ages 5-9 was 0.39 per 10,000 population.



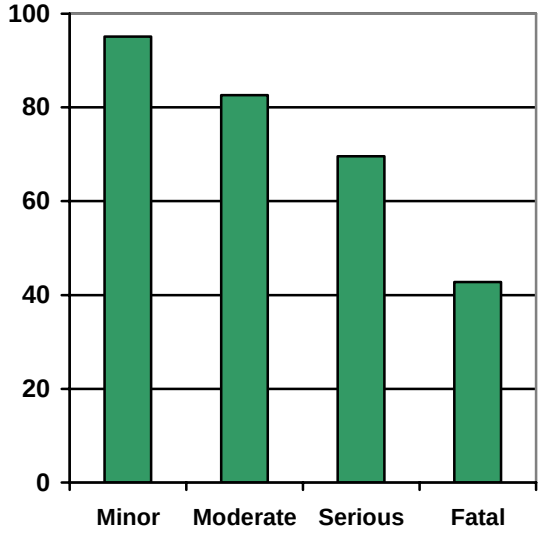
A plane crash that kills 30 people will get national news but that many people die each week in crashes in Georgia alone. A violent crime that takes the life of one young person is viewed as a national tragedy but remember more than three teens die each week in crashes.

Crashes are not a natural cause of death – they are violent deaths and they can be prevented.

Fatally injured occupants have the lowest seat belt usage. For fatally injured people seat belt usage has remained at a little over 40 percent from 2000 to 2006.

- People with minor injuries had the highest seat belt use. 95.1 percent of those with minor injuries such as minor scrapes and bruises were reported as using their seat belts.
- Seriously injured people, those with life threatening head, neck, abdominal or other serious injuries had a seat belt usage of 69.6 percent in 2006.
- The crash data seat belt usage obtained from the crash report is what is observed at the crash scene and often is simply self reported to the law enforcement officer by the occupant involved in the crash. Self reported data under these circumstances can be unreliable.

Seat Belt Use By Severity of Injury, 2006



Seat belts do not prevent crashes they prevent injuries. Failure to use seat belts is directly correlated to injury severity. The lower the seat belt use, the more serious the injury.

Motor Vehicle Occupants and Seat Belt Use*
Number and Percent Belted

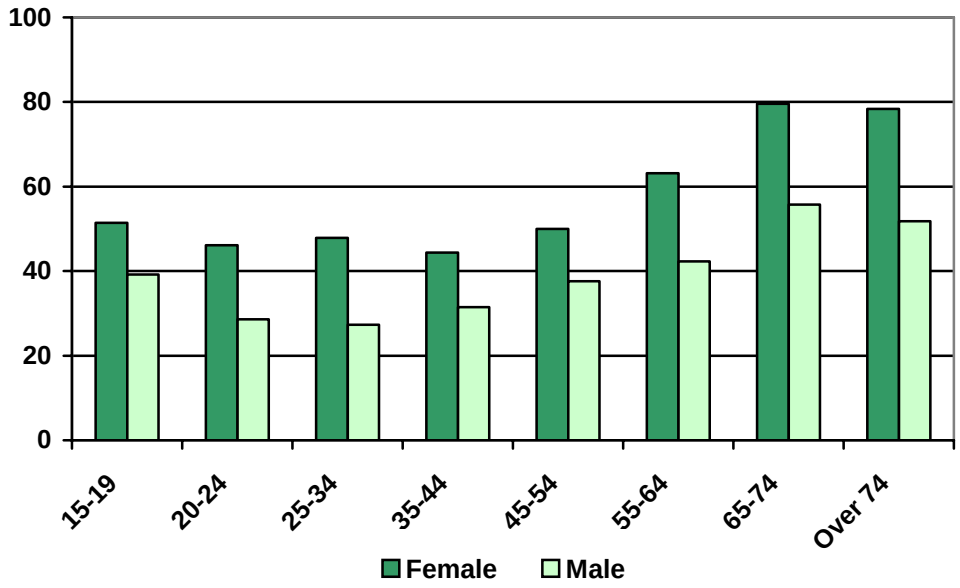
	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
All Occupants	**735,731**	**757,541**	**776,816**	**778,630**	**799,668**	**805,958**	**786,007**	**6.83**
Percent Belted	94.1	94.8	95.2	95.6	95.4	95.4	95.7	1.60
Uninjured	**614,779**	**635,194**	**654,317**	**656,206**	**672,538**	**677,947**	**664,162**	**8.03**
Percent Belted	95.3	95.9	96.1	96.5	96.3	96.3	96.6	1.30
Minor Injury	**87,175**	**88,536**	**89,068**	**89,001**	**92,141**	**93,046**	**88,703**	**1.75**
Percent Belted	93.5	94.2	94.7	95.4	95.2	95.2	95.1	1.73
Moderate Injury	**27,799**	**27,641**	**27,636**	**27,494**	**28,677**	**28,507**	**26,826**	**-3.50**
Percent Belted	78.8	80.5	82.3	83.2	82.8	82.8	82.6	4.83
Serious Injury	**4,712**	**4,842**	**4,589**	**4,682**	**5,021**	**5,104**	**5,007**	**6.26**
Percent Belted	62.5	64.4	67.4	69.2	68.5	67.7	69.6	11.32
Fatal Injury	**1,266**	**1,328**	**1,206**	**1,247**	**1,291**	**1,354**	**1,309**	**3.40**
Percent Belted	40.1	44.3	43.1	45.3	44.4	42.1	42.8	6.68

* Seat belt use as noted by the law enforcement officer on the crash report for occupants over age 5. Percent belted calculated excluding unknown seat belt usage. Persons on motorcycles, mopeds, bicycles, farm and construction equipment, motorized recreational vehicles or all terrain vehicles are excluded.

Overall seat belt usage is over 90 percent but although over nine out of ten vehicle occupants are now using seat belts the remaining people have not been persuaded that seat belts will work to prevent them from being injured or killed.

- For all age groups male occupants use seat belts less than female occupants do. For occupants in crashes male seat belt use was 2.4 percentage points lower than for female occupants. In fatal crashes male seat belt use was 18.6 percentage points lower than for female occupants.
- High-risk drivers in crashes used seat belts less often than non high-risk drivers. This increases the risk of injury in multiple ways. First high-risk driving increases the likelihood of a crash where an injury could occur and second not using a seat belt increases the risk of the occupant being injured. For drivers in speed related crashes seat belt use was 11.5 percentage points lower than for drivers in crashes overall.
- In crashes that resulted in a minor injury seat belt use by occupants of pickup trucks was 7.6 percentage points lower than for occupants of passenger cars. In fatal crashes the difference was even greater, seat belt use by fatally injured occupants of pickup trucks was 26.5 percentage points lower than for occupants of passenger cars.

Seat Belt Use in Fatal Crashes, 2006
Percent Belted by Age and Gender



Seat belt use by drivers in fatal crashes was 57.5 percentage points lower than for drivers in crashes overall.

Teens and young adults have had historically the lowest seat belt use however for fatal crashes equally low usage is found until about age 55.

In 2006, 4,029 vehicle occupants age five and under were injured in crashes, 194 more children than in 2000. Although seat belt use for adults is now about 95 percent only about 68 percent of young children in crashes are properly restrained in child safety seats.

Children Properly Restrained in Child Safety Seats by Severity of Injury, 2006

- Properly used child safety seats reduce the risk of fatal injury to young children in motor vehicle crashes by 71 percent for infants and 54 percent for toddlers.

- On July 1, 2004 the child safety seat law in Georgia changed, children age five and under must be in a child safety seat when transported in a passenger car, van or pickup truck unless the child is over 4' 9" tall. The child safety seat should be placed in the rear seat unless appropriate rear seating positions are occupied by other children.

- From 2000 to 2006 in Georgia, 204 infants and toddler vehicle occupants were killed in crashes. 1,105 children age five and under were seriously injured in crashes and 7,464 received moderate injuries. 32 children under age six were killed in crashes in 2006 a number not different from 2000.

Proper Child Safety Seat Use*
Number and Percent Proper Use

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
All Occupants	**35,694**	**37,241**	**37,944**	**38,118**	**38,811**	**40,098**	**39,536**	**10.76**
Percent Belted	75.3	77.6	78.8	64.4	67.1	68.6	68.2	-9.37
Uninjured	**31,859**	**33,488**	**34,089**	**34,227**	**34,803**	**35,876**	**35,475**	**11.35**
Percent Belted	76.7	79.0	80.2	65.6	68.4	69.8	69.5	-9.35
Minor Injury	**2,562**	**2,508**	**2,636**	**2,606**	**2,758**	**2,926**	**2,856**	**11.48**
Percent Belted	65.9	70.3	69.8	55.7	59.2	60.9	57.6	-12.58
Moderate Injury	**1,091**	**1,098**	**1,064**	**1,087**	**1,058**	**1,063**	**1,003**	**-8.07**
Percent Belted	59.8	56.2	60.0	50.2	52.8	56.0	57.9	-3.20
Serious Injury	**150**	**121**	**130**	**180**	**160**	**194**	**170**	**13.33**
Percent Belted	46.1	52.1	52.0	35.4	37.1	47.9	40.6	-11.77
Fatal Injury	**32**	**26**	**25**	**18**	**32**	**39**	**32**	**0.00**
Percent Belted	28.6	57.1	42.9	18.8	33.3	22.6	40.7	42.59

* Proper child safety seat use as noted by the law enforcement officer on the crash report for vehicle occupants under age 6. Percent proper child seat use calculated excluding unknown usage. Children on motorcycles, mopeds, bicycles, farm and construction equipment, motorized recreational vehicles or all terrain vehicles are excluded.

In 2006 alone the number of injured children ages 5-9 would fill not 10 classrooms, not 50 classrooms but 128 classrooms.

For middle school age children ages 10-14 the number is even greater. The number of injured children ages 10-14 in 2003 would fill 148 Georgia classrooms.

- 62,104 children ages 5 to 14 were injured in motor vehicle crashes from 1996 to 2003. On average 24 children were injured each day.
- In 2006, 7,664 school age children were injured as passengers in vehicles and 25 were killed. Although seat belt use for children increased, it has remained at about 80 percent over the past five years. All children need to buckle up.

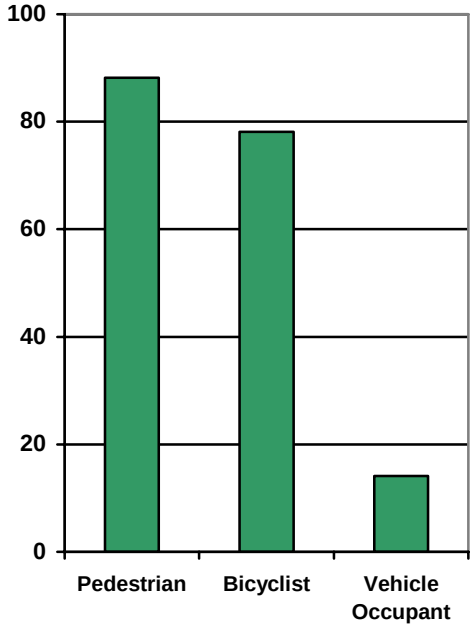
Adult seat belts are not effective unless the child is able to sit against the back of the seat with their legs bent comfortably over the seats edge. The belt should be over the shoulder and across the chest with the lap belt touching the thighs. Until then children should be in a booster seat to prevent the internal injuries that could result in a crash.

- A disproportionate number of children are injured or killed in pedestrian or bicycle crashes. For children ages 5 to 14 who were struck by vehicles 88.2 percent were injured and 2.3 percent were killed. In comparison, only 14.1 percent of the children who were vehicle occupants were injured and 0.05 percent were killed.

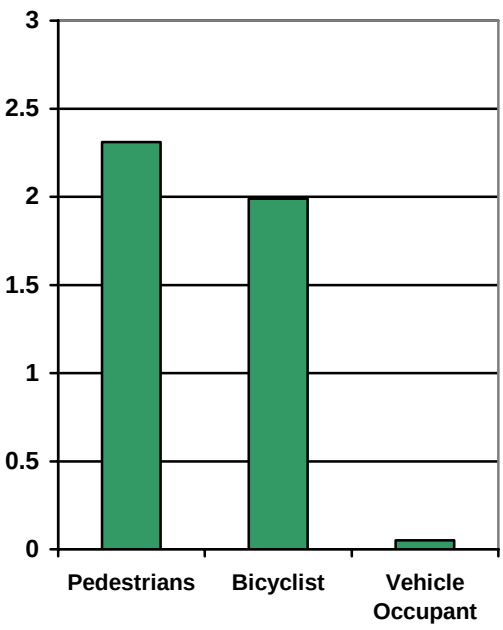
It is unfortunate that children engaged in healthy physical activity such as running, rollerblading or biking are at risk of serious injury or death.

Safety education needs to start early especially in grade school and middle school and be continued for all ages into adulthood and adults need to be good role models for their children.

Children Ages 5-14, Percent Injured 2006



Children Ages 5-14, Percent Killed 2006



A total of 1,087 pedestrians lost their lives from 2000 to 2006. One out of every 16 pedestrians in crashes was killed.

- Pedestrian crashes represented less than one percent of all motor vehicle crashes. However, a far disproportionate number of pedestrians die. Pedestrians accounted for one out of nine of the fatalities in Georgia from 2000 to 2006.
- Pedestrians are without any physical protection. A crash that would cause only minor injury to the occupants of a vehicle can result in serious injury or death to a pedestrian. All crash deaths are violent but pedestrians killed by vehicles die a particularly violent death.
- From 2000 to 2006 on average three pedestrians were killed each week. Forty pedestrians were injured on average each week.
- Georgia law recognizes the risks pedestrians face. Georgia law not only protects pedestrians within designated pedestrian crossings, it also stipulates that 'drivers must exercise due care' in regard to pedestrians in any part of the roadway. The fact that a pedestrian was not using a crosswalk does not eliminate driver responsibility in a crash. Special care must be exercised at dusk or after dark when visibility is especially poor. Even momentary driver inattention or a small lapse of judgment can result in death to a pedestrian.

Pedestrians in Motor Vehicle Crashes
Number and Rate per 10,000 Population

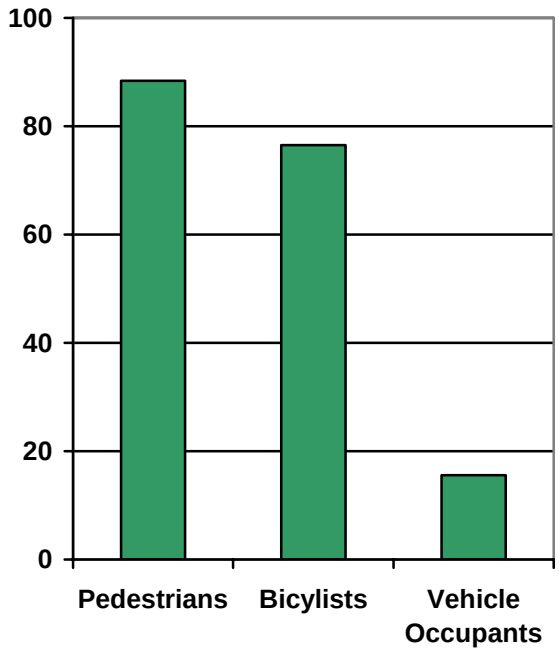
	2000	2001	2002	2003	2004	2005	2006	2000-2006
Pedestrians	2,482	2,552	2,561	2,524	2,435	2,567	2,542	17,663
Rate	3.0	3.0	3.0	2.9	2.7	2.8	2.7	2.9
Injuries	2,066	2,146	2,118	2,086	1,983	2,076	2,057	14,532
Rate	2.5	2.5	2.5	2.4	2.2	2.3	2.2	2.4
Fatalities	139	158	166	161	156	150	157	1,087
Rate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

*We have no measure of the frequency of pedestrian traffic. Rate per 10,000 population may provide a limited measure of the frequency or risk to pedestrians in Georgia.

Pedestrians are 32 times more likely to be killed in motor vehicle crashes than vehicle occupants are.

- The serious risk pedestrians face on the road can be demonstrated by examining the proportion of injuries that result when a vehicle hits a pedestrian compared with a vehicle to vehicle collision.
- From 2000 to 2006, 82.3 percent of pedestrians were injured compared with 15.4 percent of vehicle occupants.
- 6.15 percent of pedestrians in motor vehicle crashes were killed compared with only 0.19 percent of crash vehicle occupants.
- The risk of a pedestrian being seriously injured in a motor vehicle crash is 19 times greater than the risk of serious injury to a crash vehicle occupant. In 2006, only 0.75 percent of vehicle occupants were seriously injured compared with 14.4 percent of pedestrians.
- Only 12 percent of the pedestrians involved in motor vehicle crashes were uninjured compared with 84 percent of crash vehicle occupants.
- From 2000 to 2006, 74.7 percent of all bicyclists in motor vehicle crashes were injured and 1.74 percent were killed.

Severity of Injury, 2000-2006
Percent Injured or Killed



Severity of Injury, 2000-2006
Percent Injured or Killed

	Percent Injured	Percent Killed
Pedestrians	82.3	6.15
Bicyclists	74.7	1.74
Vehicle Occupants	15.4	0.19

- Bicyclists are nine times more likely to be killed in crashes than vehicle occupants. 1.74 percent of bicyclists in motor vehicle crashes were killed compared with 0.19 percent of vehicle occupants.
- The risk of a bicyclist being seriously injured in a motor vehicle crash is ten times greater than the risk of serious injury to a crash vehicle occupant. In 2006, only 0.75 percent of vehicle occupants were seriously injured compared with 7.6 percent of bicyclists.

From 2000 to 2006 over eight out of ten of the pedestrians struck by vehicles were injured. Of those injured one out of five were children under the age of 15.

- Over the past eight years 3,177 children ages 0-14 were injured as pedestrians while crossing the street, walking or playing in the roadway.
- The pedestrian injury rate per 10,000 population is greater for young persons than older persons. The pedestrian injury rate per 10,000 population for teens ages 15-19 is double the rate for adults over age 24. From 2000 to 2006, 1,772 teenagers ages 15-19 and 1,412 young adults ages 20-24 were injured.
- The pedestrian injury rate gradually declines after age 19.

Pedestrian Injuries by Age
Number and Rate per 10,000 Population

Ages		2000	2001	2002	2003	2004	2005	2006	2000-2006
0-4	Number	84	75	74	66	70	48	52	469
	Rate	1.40	1.20	1.15	1.00	1.04	0.69	0.74	1.02
5-9	Number	204	183	176	170	137	144	123	1,137
	Rate	3.31	2.96	2.85	2.75	2.18	2.25	1.85	2.58
10-14	Number	211	234	227	259	238	219	183	1,571
	Rate	3.45	3.71	3.54	3.99	3.58	3.30	2.73	3.46
15-19	Number	222	286	220	258	229	284	273	1,772
	Rate	3.72	4.77	3.63	4.21	3.63	4.33	4.03	4.05
20-24	Number	181	182	231	214	201	198	205	1,412
	Rate	3.02	2.95	3.64	3.31	3.06	3.04	3.12	3.15
25-34	Number	284	319	257	275	278	290	279	1,982
	Rate	2.18	2.43	1.93	2.04	2.07	2.14	2.03	2.13
35-44	Number	318	336	349	292	281	287	277	2,140
	Rate	2.34	2.45	2.53	2.11	1.99	2.01	1.90	2.18
45-54	Number	240	229	244	247	267	248	273	1,748
	Rate	2.20	2.04	2.13	2.12	2.17	1.95	2.08	2.08
55-64	Number	107	108	113	111	100	154	160	853
	Rate	1.60	1.56	1.55	1.44	1.19	1.73	1.71	1.53
65-74	Number	44	47	51	52	63	55	54	366
	Rate	1.01	1.06	1.14	1.14	1.34	1.13	1.07	1.13
>74	Number	39	40	40	62	30	32	42	285
	Rate	1.11	1.12	1.09	1.67	0.78	0.80	1.03	1.07

Pedestrian rates can be very misleading. We have no measure of pedestrian traffic or number of people that walk or how many miles they walk. Therefore we don't know if low numbers equal safety or simply fewer people walking.

In Georgia from 2000 to 2006 there were 6,797 bicyclists involved in crashes, 5,078 injuries resulted and 118 bicyclists died.

Bicycle crashes are deadly. Bicyclists are ten times more likely to be killed in crashes than vehicle occupants are.

- Bicycle helmets reduce the risk of head injury by 85 percent. Helmets must be positioned correctly centered on the bicyclist's head and not tipped back. The helmet straps should always be buckled and the helmet should not rock from side to side or forward and backward. The helmet should meet or exceed the U.S. Consumer Product Safety Commission's safety standards.
- Of the 6,797 bicyclists in crashes from 2000-2006 only 12.2 percent were wearing a bicycle helmet, only 827 riders.
- 118 people died in bicycle crashes from 2000 to 2006. Only twenty-two were wearing a helmet.
- The majority of bicyclists in crashes were male. From 2000 to 2006 over eight out of ten of the bicyclists in crashes was male.

Although safety issues that affect pedestrians also affect bicycles, bicycles are vehicles and as such must follow all rules of the road.

The top three bicyclist errors were failure to yield, wrong side of road and failure to stop at stop sign or signal.

- Children ages 5 to 14 accounted for 20 percent of the injured bicyclists in crashes from 2000 to 2006. In comparison children ages 5-14 were 6.6 percent or one out of twenty of the total injuries from 2000 to 2006.
- Half of the bicycle crashes occurred on city streets. From 2000 to 2006 six out of ten bicycle crashes were on city streets. In comparison the vast majority of fatal bicycle crashes were on roads designated as state routes.

Bicyclists: Crashes, Injuries and Fatalities

	2000	2001	2002	2003	2004	2005	2006	2000-2006
Bicyclists	1,018	977	948	973	963	959	959	6,797
Injuries	760	727	711	749	707	705	719	5,078
Fatalities	14	20	12	16	18	21	17	118

From 2000 to 2006 city streets had the highest number of pedestrian crashes however state routes had the highest number of pedestrian fatalities.

- City streets accounted for the vast majority of pedestrian crashes. Almost one out of two pedestrian crashes occurred on city streets. Out of the 17,663 pedestrians hit by vehicles 8,240 were struck on city streets. Very few neighborhoods in Georgia have sidewalks or bicycle paths. This may be reflected in the high number of pedestrian crashes on city streets.

- In contrast the highest number of fatal pedestrian crashes occurred on state routes. From 2000 to 2006 four out of ten fatal pedestrian crashes occurred on state roadways. Of the 1,087 pedestrians killed 486 died on state roads. The combination of infrequent crosswalks, no pedestrian walkways and high speed may account for the high number of fatalities on state routes.

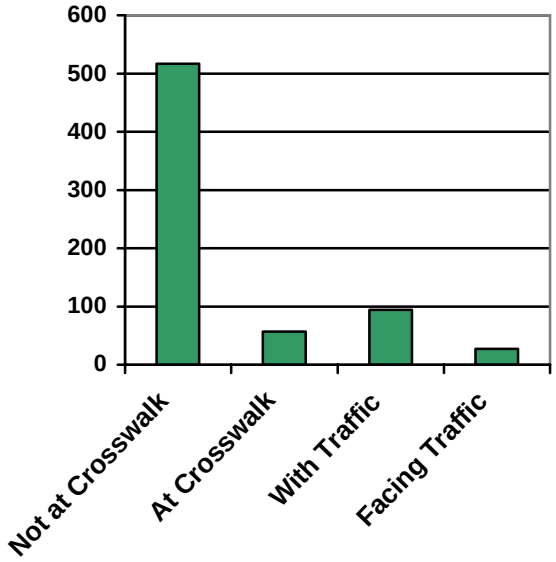
- Regardless of the severity of injury half of the pedestrian crashes occurred at an intersection. 55.5 percent of the pedestrian crashes happened at an intersection, and they accounted for 45.9 percent of the pedestrian injuries and 55.3 percent of the pedestrian fatalities.

Positive actions that protect pedestrians:

- ***Use the crosswalk***
- ***Look in all directions before entering and while crossing the street***
- ***Walk facing oncoming traffic***
- ***Always be aware of where vehicles are***
- ***Wear light or reflective clothing at dusk and night***
- ***Do not play in the road and do not let children play in roadway***
- ***Never attempt to cross interstates or other high speed roads***

Assume drivers make mistakes – mistakes that could cost your life.

Pedestrian Fatalities by Pedestrian Action



- In 2006 driver error was reported to be a contributing factor 1,021 times in pedestrian crashes. Failure to yield was the most frequent driver error – it was reported 272 times in pedestrian crashes.

- From 2000 to 2006, 6,670 pedestrians were struck while attempting to cross the street not at a crosswalk. In comparison, 2,591 pedestrians were struck by vehicles when using the crosswalk to cross the street.

- One out of two pedestrians was killed crossing a street and not using a crosswalk. 517 pedestrians were killed crossing the street not using a crosswalk and 57 were killed using the crosswalk.

- 1,333 pedestrians were hit while walking with traffic compared with 578 who were walking facing oncoming traffic. 94 pedestrians died while walking with traffic compared with 27 who were walking against traffic.

The highest pedestrian fatality rate occurred in metropolitan statistical areas other than Atlanta. The pedestrian fatality rate for the other MSA's was double the fatality rate for the Atlanta suburban counties.

- The fifteen Atlanta suburban counties had the lowest number of pedestrian crashes, injuries and fatalities.
- In 2006 the five Atlanta metropolitan counties accounted for 42.7 percent of the pedestrian fatalities.
- When compared to 2000 the pedestrian fatality rates declined for all regions except the five Atlanta counties and counties in the other MSA's in Georgia that showed the greatest increase, 17.2 from 2000 to 2006.
- The greatest decline in the pedestrian fatality rate was in rural counties, 18.7 percent from 2000 to 2006.

Pedestrian Crashes Injuries and Fatalities by Region*
2000 to 2006
Number and Rate per 100 Million Vehicle Miles Traveled

	2000		2006		Percent Change in	Percent Change in
	Number	Rate	Number	Rate	Number	Rate
Crashes						
Atlanta	1,266	4.32	1,266	3.73	0.00	-13.52
Atlanta Suburban	190	1.65	231	1.53	21.58	-7.55
Other MSA	599	3.85	583	3.51	-2.67	-8.72
Rural Counties	427	1.69	462	1.70	8.20	0.58
Injuries						
Atlanta	1,075	3.67	1,017	3.00	-5.40	-18.18
Atlanta Suburban	158	1.37	182	1.20	15.19	-12.41
Other MSA	489	3.14	486	2.93	-0.61	-6.79
Rural Counties	344	1.36	372	1.37	8.14	0.53
Fatalities						
Atlanta	55	0.19	67	0.20	21.82	5.35
Atlanta Suburban	12	0.10	15	0.10	25.00	-4.95
Other MSA	32	0.21	40	0.24	25.00	17.23
Rural Counties	40	0.16	35	0.13	-12.50	-18.66

*Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties.

In Georgia over 4 million drivers have been involved in motor vehicle crashes since 2000 and 16,877 people lost their lives in those crashes. On average 1,719 drivers were involved in motor vehicle crashes each day from 2000 to 2006 – 72 drivers every hour.

- Crashes are the result of a combination of factors. Consider the driver in a bad mood running late and driving too fast on an unfamiliar two-lane narrow winding road and it starts to rain. And he crashes. All we have is what is on the crash form and that will certainly be missing vital information. The driver's mood or attitude will most certainly not be recorded. In fact speeding may never be recorded on the crash report if there is no physical evidence such as skid marks.

- From the crash data we cannot place definitive blame on any one driver from the crash data. We can only look for reasons. We can use the contributing factors noted by the officer at the crash scene to give clues to errors in judgement or high-risk behavior in the crash but from that frequency we can make only certain limited assumptions.

- Law enforcement cannot be everywhere. Drivers need to understand the risk and drive accordingly. Too often drivers do not even perceive the risk. For some drivers their risk threshold is higher than average. Data indicates that risk taking can be addictive and reduce the perception of risk. Race car drivers although they may have superior driving skills have been shown to have a crash rate higher than other drivers.

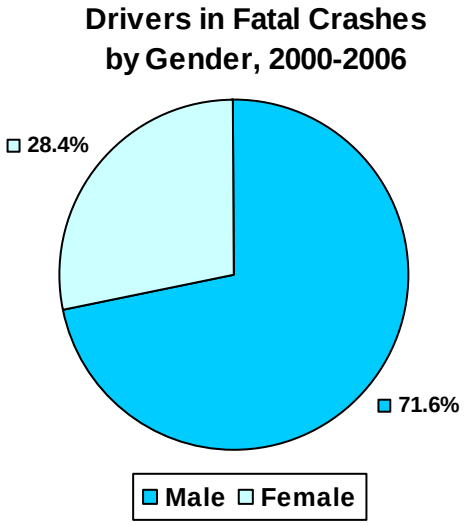
- Younger and older drivers are especially at risk although for different reasons. For these drivers the risk increases on the high risk two-way roads where three out of four fatal crashes occur in Georgia.

Drivers In Crashes
Number and Rate per 10,000 Population

	2000	2001	2002	2003	2004	2005	2006	2000-2006
Crash Drivers	585,916	603,217	621,439	626,906	648,701	657,322	647,402	4,390,903
Rate	931.9	937.4	945.6	937.3	948.9	939.5	900.7	934.1
Injury Crash Drivers	159,796	164,476	165,090	165,709	171,818	173,925	167,048	1,167,862
Rate	194.1	195.2	192.0	189.4	192.3	190.4	178.4	190.1
Fatal Crash Drivers	2,244	2,438	2,260	2,377	2,434	2,609	2,515	16,877
Rate	3.6	3.8	3.4	3.6	3.6	3.7	3.5	3.6

Data excludes bicyclists and pedestrians
The population rate is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

Almost three out of four of the drivers in fatal crashes were male drivers. From 2000 to 2006, male drivers were involved in 71.6 percent of the fatal crashes, although they accounted for only 49.2 percent of the population in Georgia.



- The fatal crash rate for male drivers was more than two and one-half times greater than the fatal crash rate for female drivers.
- From 2000 to 2006 the number of drivers in fatal crashes increased for both male and female drivers but the increase was greater for male drivers. The fatal crash rate for female drivers declined slightly from 2000 to 2006 but the fatal crash rate remained essentially the same for male drivers.
- Male drivers represent the vast majority of drivers in fatal crashes. The reason may be due to higher risk taking. In 2006 male drivers accounted for 84.6 percent of the drivers in fatal crashes involving illegal or unsafe speed and three out of four of the drivers in deadly single vehicle crashes such as overturned or fixed object. In addition, male drivers in fatal crashes had only a 48 percent seat belt usage.
- In 2006 male drivers represented 78.6 percent of the drivers in fatal crashes on high risk curved roadways.

Drivers in Crashes by Gender

	2000	2001	2002	2003	2004	2005	2006	2000-2006
Crash Drivers								
Female	244,972	254,012	262,530	265,843	274,140	278,819	276,062	1,856,378
Rate	586.0	594.1	601.8	597.7	604.2	601.2	580.8	595.1
Male	340,944	349,205	358,909	361,063	374,561	378,503	371,339	2,534,524
Rate	841.9	841.8	847.4	839.3	851.7	842.1	805.3	838.2
Injury Crash Drivers								
Female	70,718	72,694	73,475	74,258	76,673	77,740	74,918	520,476
Rate	169.2	170.0	168.4	166.9	169.0	167.6	157.6	166.8
Male	89,078	91,782	91,615	91,451	95,145	96,185	92,130	647,386
Rate	220.0	221.2	216.3	212.6	216.4	214.0	199.8	214.1
Fatal Crash Drivers								
Female	655	682	632	678	714	725	703	4,789
Rate	1.57	1.60	1.45	1.52	1.57	1.56	1.48	1.54
Male	1,589	1,756	1,628	1,699	1,720	1,884	1,812	12,088
Rate	3.92	4.23	3.84	3.95	3.91	4.19	3.93	4.00

Data excludes bicyclists and pedestrians
The population rate is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

One out of ten of the drivers in crashes in Georgia in 2006 had driver's licenses from other states or countries. This proportion is even greater for drivers in fatal crashes.

- About one out of eight of the drivers in fatal crashes in Georgia had out-of-state driver licenses.
- The majority of out-of-state drivers were from nearby states for both crashes and fatal crashes. 63.0 percent of the crash out-of-state drivers and 72.1 of the fatal out-of-state drivers were from nearby states.
- 33.3 percent of the out-of-state drivers in crashes received citations compared with 28.2 percent of the crash drivers with Georgia licenses.

Out-of-State Drivers in Crashes in Georgia, 2006

License State	Crash	Fatal Crashes
Drivers in Crashes	590,266	2,314
Georgia License	535,741	2,020
Non-Georgia License	54,525	294
Percent Non-Georgia License	10.2	12.7

Excludes drivers with unknown or no license

Drivers in Crashes in Georgia From Nearby States, 2006
Number and Percent of Out-Of-State Drivers

	Crash		Fatal Crashes	
License State	Number	Percent	Number	Percent
FL	10,226	18.8	54	18.4
AL	6,430	11.8	42	14.3
NC	5,533	10.1	34	11.6
SC	4,853	8.9	27	9.2
TN	4,723	8.7	32	10.9
TX	2,562	4.7	23	7.8
Total	34,327	63.0	212	72.1

- Of the fatal crashes occurring on Georgia interstates one-third of the drivers with known licenses had out of state licenses.
- The lowest number of out-of-state drivers in fatal crashes was on county routes. One out of ten of the drivers in fatal crashes on state routes or city streets had out-of-state licenses.

Drivers in Fatal Crashes by License State, 2006

	Interstate	State Route	County Route	City Street
Drivers in Fatal Crashes	363	1124	610	217
Georgia License	239	1005	586	190
Non-Georgia License	124	119	24	27
Percent Non-Georgia License	34.2	10.6	3.9	12.4

Excludes drivers with unknown or no license

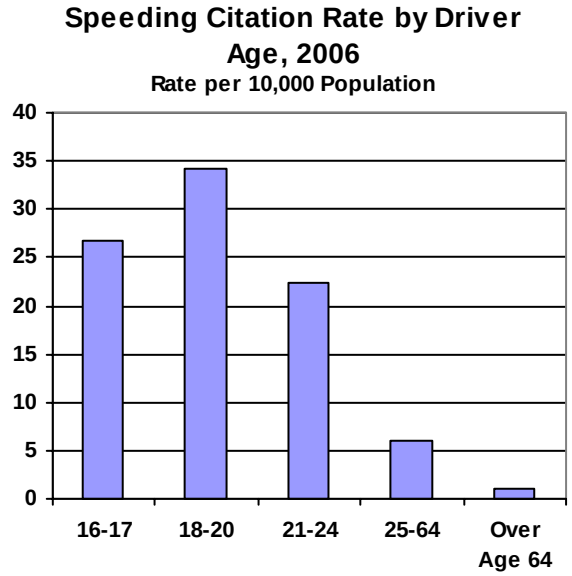
Drivers age 21 received the highest number of citations for a single age group. 8,737 traffic citations were written to 21-year-old drivers in crashes in 2006.

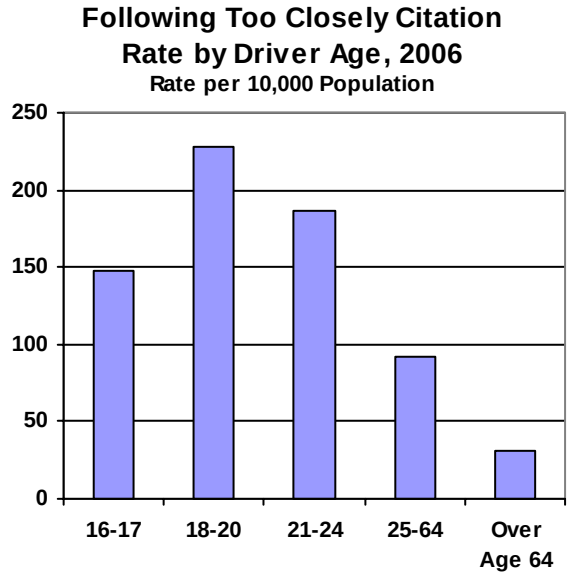
- The highest number of traffic citations was written for following too closely. The second greatest number of tickets was for failure to yield. 73,033 citations were written for following too closely and 31,670 for failure to yield. A total of 224,755 traffic citations were issued in the 342,534 motor vehicle crashes in 2006.

- Citation data can be unreliable due to the fact that when officers arrive at the crash scene it is not always possible to determine exactly what happened. In addition, citation data from fatal crashes may not give a true picture because citations are rarely given to drivers killed in crashes.

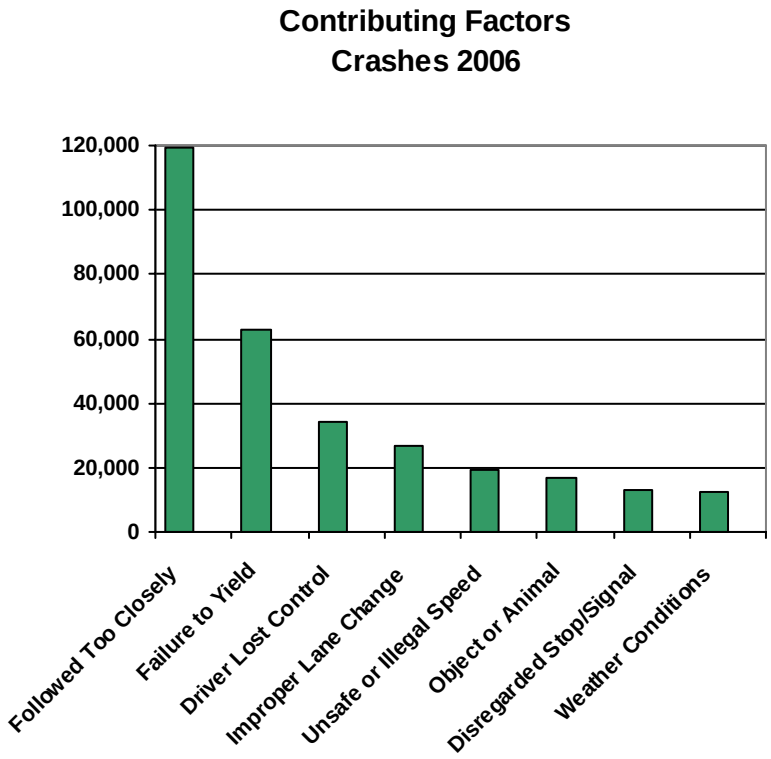
- Calculating a rate per population for each type of traffic citation gives us an idea of the risk or frequency for certain drivers. For example, the speeding citation rate per 10,000 crash drivers is 34.1 for crash drivers ages 18-20 compared with 6.1 for drivers ages 25-64. Unsafe or illegal speed is one of the top three contributing factors in fatal crashes involving drivers ages 18-20.

- The highest citation rate per 10,000 population for following too closely was for drivers ages 18-20. The highest number of citations was for following too closely and following too closely was also the highest contributing factor in crashes in 2006.





The crash contributing factors gives us potential reasons why the crash occurred. Although crashes are rarely caused by a single factor examining single contributing factors provides information on driver behaviors and errors that increase the risk of a crash occurring.



- Followed too closely has been the most frequent contributing factor in crashes for the past eleven years. In 2006 it was noted by law enforcement officers 119,305 times in motor vehicle crashes.

- One out of three drivers was noted as involving following too closely.

- Failure to yield was the second most frequent recorded crash contributing factor, reported 63,037 times in 2006. Over one out of five crashes involved failure to yield.

Crash Contributing Factors
Number and Rate per 10,000 Population

	Number	Rate
Follow Too Closely	119,305	127.41
Failure to Yield	63,037	67.32
Driver Lost Control	33,946	36.25
Improper Lane Change	26,891	28.72
Unsafe or Illegal Speed	19,071	20.37
Object or Animal	16,807	17.95
Disregarded Stop/Signal	12,907	13.78
Weather Conditions	12,449	13.29

*Count of number of times the contributing factor was noted for drivers in a crash. More than one contributing factor may be noted for a driver. The contributing factors listed do not represent all possible factors. Data excludes bicyclists and pedestrians.

- Unlike its high frequency in fatal crashes unsafe or illegal speed was noted in 19,071 crashes. One out of 17 crashes involved unsafe and or illegal speed.

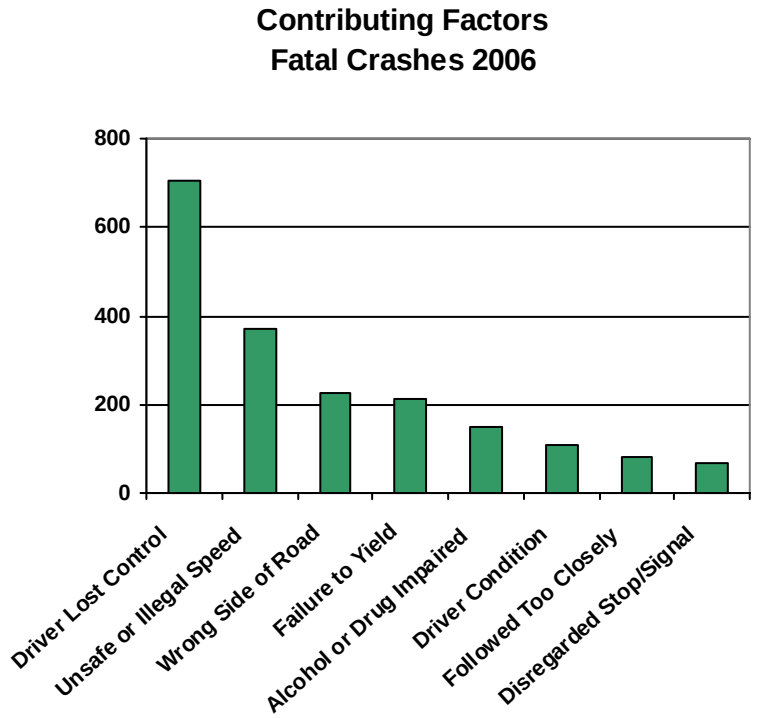
- In 2006, driver lost control was noted 33,946 times and improper lane change was noted 26,891 times in crashes.

- Disregarded a stop sign or signal in crashes was noted by officers 12,907 times in 2006.

- Weather conditions were indicated as a contributing factor 12,449 times out of the 342,534 crashes in 2006.

Compared with other crashes fatal crashes have show a different pattern of contributing factors.

- In 2006, the highest contributing factor in fatal crashes was driver lost control compared with crashes overall in which following too closely was the leading contributing factor.
- The second highest contributing factor in fatal crashes was unsafe or illegal speed compared with failure to yield for crashes overall.
- Driver lost control was the most frequently noted contributing factor in fatal crashes, reported 706 times for the 2,515 drivers in fatal crashes in 2006. It has been the most frequent contributing factor for the past 11 years.



- Unsafe or illegal speed was the next highest contributing factor reported 370 times.

Fatal Crash Contributing Factors
Number and Rate per 10,000 Population

	Number	Rate
Driver Lost Control	706	0.75
Unsafe or Illegal Speed	370	0.40
Wrong Side of Road	225	0.24
Failure to Yield	212	0.23
Alcohol or Drug Impaired	149	0.16
Driver Condition	107	0.11
Follow Too Closely	81	0.09
Disregarded Stop/Signal	69	0.07

*Count of number of times the contributing factor was noted for drivers in a fatal crash. More than one contributing factor may be noted for a driver. The contributing factors listed do not represent all possible factors. Data excludes bicyclists and pedestrians.

- Out of the 2,515 drivers in fatal crashes in 2006 28 percent were noted as lost control of vehicle.
- Driving on the wrong side of the road was noted 225 times for the drivers in fatal crashes.
- Failure to yield was noted 212 times in the fatal crashes in 2006.
- Alcohol or drug impaired was reported 149 times and driver condition 107 times for drivers in fatal crashes.
- Often it is not one single factor, but several that combine and result in a deadly crash. Yet each factor is critical because they are part of the chain of events that lead to a fatal crash.

Speeding may never be recorded on the crash report if there is no physical evidence such as skid marks however speed is closely associated with crashes involving loss of control of the vehicle, following too closely or failure to yield.

Speed decreases the time available to make split second decisions, increases the difficulty in maneuvering the vehicle, reduces the time and ability to safely stop, and contributes significantly to the severity of impact.

- Unsafe or illegal speed is involved in at least one out of six fatal crashes in Georgia.
- 19,007 crashes and 370 fatal crashes involved unsafe or illegal speed in 2006.
- Young drivers are involved in speed related crashes more often than older drivers. Unsafe or illegal speed was noted for 23.1 percent of the drivers ages 18-20 in fatal crashes, compared with 14.2 percent of drivers in fatal crashes over age 24.
- For crashes and crashes that resulted in nonfatal injuries there has been little change in the number or rate of speed related crashes.

- Fatal crashes show a different pattern. The number of speed related fatal crashes has increased although the rate per 10,000 population has remained very much the same.

Drivers in Unsafe or Illegal Speed Related Crashes

Rate per 100 Million Vehicle Miles Traveled

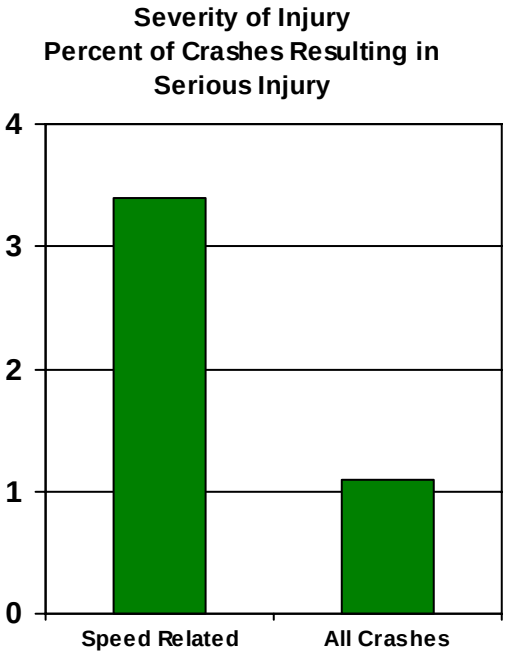
	2000	2001	2002	2003	2004	2005	2006	2000-2006
Drivers	20,262	20,128	21,202	20,776	20,628	20,734	19,007	142,737
Rate	19.6	18.8	20.5	19.2	18.4	18.6	17.1	18.9
Injury Drivers	8,529	8,612	8,934	8,617	8,727	8,720	8,081	60,220
Rate	8.2	8.1	8.6	8.0	7.8	7.8	7.3	8.0
Fatal Drivers	319	340	309	338	327	333	370	2,336
Rate	0.31	0.32	0.30	0.31	0.29	0.30	0.33	0.31

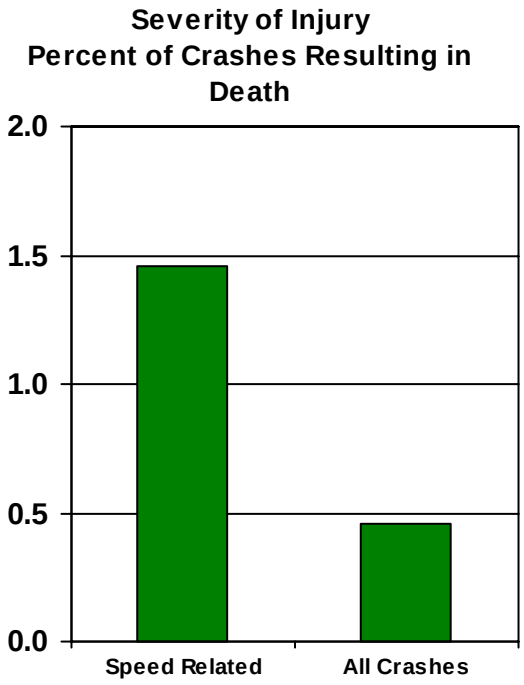
*Count of number of times the contributing factor was noted for drivers in a fatal crash.

The chance of a crash being fatal is three times higher in crashes related to speed than crashes not speed related. In 2006 the percent of all crashes resulting in death was only 0.46 percent compared with 1.46 percent for speed-related crashes.

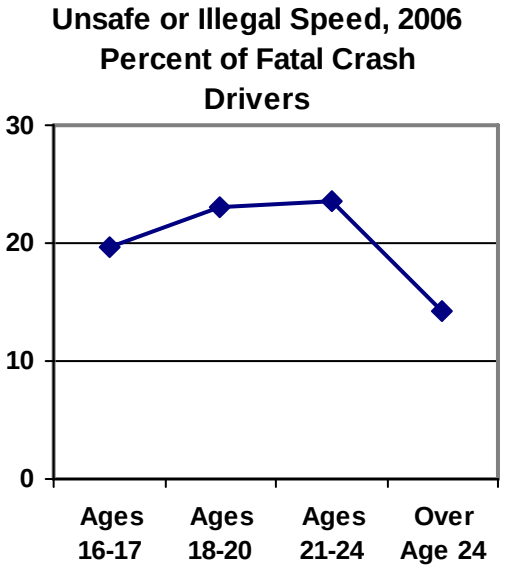
- Unsafe or illegal speed increases not only the risk of a crash but the chance that someone will be injured or killed if a crash occurs.
- Small increases in speed can increase the severity of injury while small reductions in speed can be effective in preventing deaths and reducing injuries. Regions that have introduced speed cameras have seen reductions in fatalities and serious injuries on their roads.
- The chance of being seriously injured is three times higher in crashes related to speed than crashes not related to speed. In 2006 the percent of all crashes resulting in serious injury was only 1.1 percent compared with 3.4 percent for speed-related crashes.

Injury severity follows simple physics, severity of injury equals severity of impact (mass x speed = force of impact). When a vehicle traveling at 70-mph strikes a fixed object or another vehicle the car stops suddenly. If unrestrained by a safety belt the occupants continue to move forward as fast as the vehicle was going until they strike the windshield or another part of the vehicle or are ejected as in many cases to be rolled over by their own vehicle.





The inexperience and immaturity of younger drivers are thought to be major contributing factors to their high crash fatality rate. Recent neurological research indicates that the decision making part of the brain, the frontal lobe, is not fully developed until about age 23. That is reflected in the crash data.



- The three top contributing factors to fatal crashes involving drivers ages 16-17 were driver lost control of vehicle, unsafe or illegal speed, and failure to yield. For drivers over age 24, the top three contributing factors to fatal crashes were the same but in lower proportions.

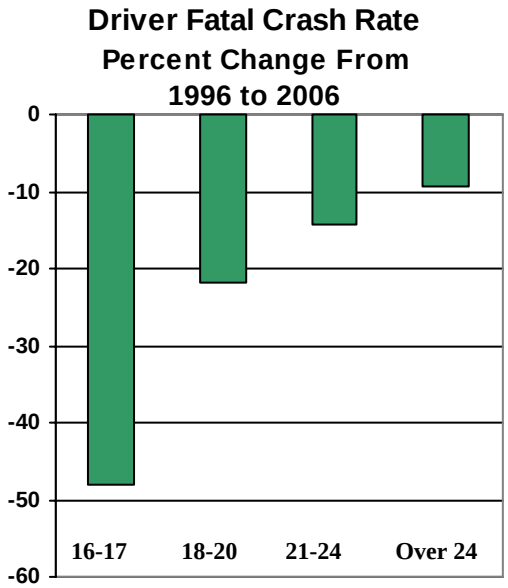
- Lost control of vehicle was noted for 38.3 percent of the drivers ages 16-17 in fatal crashes, compared with 32.1 percent of drivers over age 24 in fatal crashes. Unsafe or Illegal Speed was noted for 19.6 percent of the drivers ages 16-17 in fatal crashes, compared with 14.2 percent of drivers over age 24 in fatal crashes.

- Risk taking such as speeding or riding a roller-coaster increase dopamine levels in the pleasure centers of the brain and induce a feeling of well-being. Research suggests that that this can be addictive and cause the person to take one more ride or push the pedal down more. Although this affects persons of all ages the younger person may be more affected.

- In spite of the higher fatal crash rate for younger drivers, drivers over the age of 24 accounted for three out of four drivers in fatal crashes.

- As in previous years, the most dangerous time of day for drivers age 16 is not late at night but after school in the afternoon rush hour. In 2006, one fourth of all fatalities in crashes involving at least one driver age 16 occurred from 3-6 PM. The most dangerous time was in the early evening hours from 6-9 PM when 28.2 percent of the fatalities happened. From midnight to 3:00 AM three fatalities occurred in crashes involving 16-year-old drivers. No fatalities occurred from 3 to 6:00 AM.

From before the Teenage and Adult Driver Responsibility Act went into effect in 1996 to 2006 the number of fatal crashes involving drivers ages 16-17 declined dramatically.



- The Teenage and Adult Driver Responsibility Act went into effect on July 1, 1997 to reduce the number of lives lost in crashes involving young drivers. There was an immediate decline in fatal crashes involving drivers ages 16-17 that has held over the past 11 years.
- In crashes involving drivers ages 16-17 there were 6,160 fewer crashes in 2006 than in 1996.
- The crash rate per 10,000 population for ages 16-17 declined 37.1 percent from 1996 to 2006.
- When comparing 1996 with 2006, the number of drivers ages 16-17 in fatal crashes declined 32.8 percent but the decline for drivers ages 18-20 was only 3.3 percent. In comparison the number of drivers over age 24 in fatal crashes increased 16.9 percent.
- From 1996 to 2006, the number of drivers in crashes increased for all age groups except for drivers ages 16-17 although the crash rate per 10,000 population declined for all types of crashes.
- A declining rate simply indicates the *relative* risk has declined it does not mean that all safety issues have been effectively addressed and the crash risk or risk of injury is still not significant.

Young Drivers in Crashes

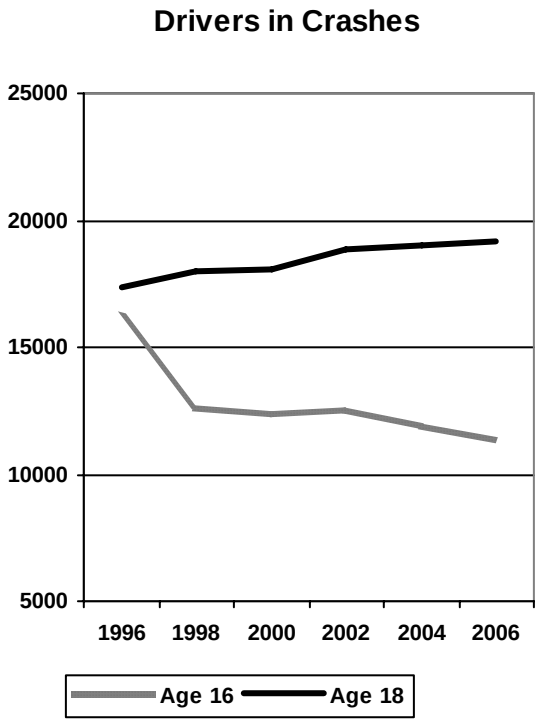
Number and Rate per 10,000 Licensed Drivers

	1996		2006		Percent	Percent
	Number	Rate	Number	Rate	Change in Number	Change in Rate
All Crashes						
16-17	32,968	1,525.5	26,808	960.1	-18.68	-37.06
18-20	49,232	1,575.9	54,697	1,415.2	11.10	-10.20
21-24	62,024	1,490.7	67,393	1,276.2	8.66	-14.39
Over 24	388,466	835.8	455,520	759.9	17.26	-9.08
Injury Crashes						
16-17	10,848	502.0	7,665	274.5	-29.34	-45.31
18-20	15,956	510.7	15,372	397.7	-3.66	-22.13
21-24	19,483	468.3	18,299	346.5	-6.08	-26.00
Over 24	117,769	253.4	118,945	198.4	1.00	-21.69
Fatal Crashes						
16-17	128	5.9	86	3.1	-32.81	-48.00
18-20	210	6.7	203	5.3	-3.33	-21.86
21-24	247	5.9	269	5.1	8.91	-14.19
Over 24	1,583	3.4	1,851	3.1	16.93	-9.34

Data excludes bicyclists and pedestrians. Population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

Graduated licensing was designed to protect the youngest drivers and has been very effective for drivers age 16 and 17 but it was also thought that it might have long term effects and produce better future drivers.

- No reduction in fatal crashes in 2003 was seen for the drivers age 20 who had gone through graduated licensing at age 16 in 1999 when graduated licensing was in full effect in Georgia.
- Drivers who were age 20 in 2003 and later years did not have fewer crashes than drivers who were age 20 in 1996 before the law went into effect.
- Without knowing exactly which drivers went through graduated licensing it is impossible to say if it had long term effect on the young drivers. The data presented here is only by driver age and does not differentiate between young drivers who went through graduated licensing and those that didn't.



Young Drivers in Crashes

Crash Drivers Age	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
16	16,143	14,843	12,628	**12,803**	12,418	12,670	12,578	11,906	11,954	11,739	11,388
17	16,825	17,253	16,219	15,424	**15,475**	15,464	16,516	16,012	16,212	15,766	15,420
18	17,366	17,613	17,964	18,045	18,376	**18,853**	19,589	19,009	19,167	19,200	18,826
19	16,453	16,401	16,764	17,158	17,807	18,264	**18,658**	18,404	18,901	19,066	18,284
20	15,413	15,845	15,933	15,987	17,038	17,245	17,862	**17,849**	18,153	18,050	17,587
21-24	62,024	60,373	60,430	59,190	62,245	64,577	67,375	68,150	70,386	69,678	67,393
Over 24	388,466	397,202	410,561	402,664	409,909	421,933	433,224	439,399	454,260	462,806	455,519
Fatal Crash Drivers											
16	65	45	41	**43**	40	50	44	44	33	39	39
17	63	59	52	53	**46**	57	49	68	46	47	47
18	77	65	68	75	76	**74**	70	70	79	74	70
19	73	64	51	61	62	79	**60**	51	71	79	64
20	60	52	68	67	56	64	48	**65**	68	75	69
21-24	247	252	224	188	219	276	219	239	246	248	269
Over 24	1,583	1,631	1,696	1,597	1,686	1,776	1,682	1,769	1,817	1,962	1,851

Data excludes bicyclists and pedestrians.

The older driver faces the same risks other drivers face but their driving challenges may be greater. Although possessing greater experience the older driver may have difficulty in seeing, hearing or mobility that can negatively impact their driving abilities.

Older drivers often self regulate and either restrict their night driving or stop driving altogether when they feel their driving may be impaired.

- From 2000 to 2006 the number of drivers in crashes over ages 65-74 increased 12.4 percent although the rate per 10,000 population declined 2.8 percent. The number of drivers ages 65-74 in fatal crashes increased 19.1 percent and the rate increased 2.97 percent.

Older Drivers In Crashes

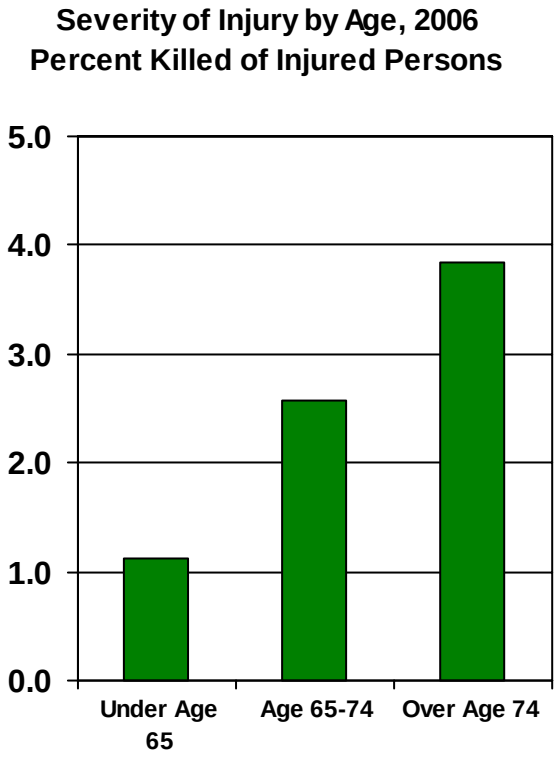
Rate per 10,000 Population

	2000		2006		Percent Change in	Percent Change in
	Number	Rate	Number	Rate	Number	Rate
All Crashes						
16-24	143,359	1,327.6	148,898	1,247.3	3.86	-6.05
25-64	376,371	851.8	418,782	824.1	11.27	-3.25
65-74	21,146	484.7	23,770	471.3	12.41	-2.77
Over 74	12,392	351.5	12,968	317.4	4.65	-9.68
Non-Fatal Injury Crashes						
16-24	41,296	382.4	41,336	346.3	0.10	-9.46
25-64	103,304	233.8	108,884	214.3	5.40	-8.35
65-74	6,064	139.0	6,441	127.7	6.22	-8.13
Over 74	3,686	104.5	3,620	88.6	-1.79	-15.24
Fatal Crashes						
16-24	499	4.6	558	4.7	11.82	1.15
25-64	1,445	3.3	1,594	3.1	10.31	-4.08
65-74	126	2.9	150	3.0	19.05	2.97
Over 74	115	3.3	107	2.6	-6.96	-19.70

Data excludes bicyclists and pedestrians. Population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

- For drivers over age 74 the number of drivers in crashes increased 4.65 percent. The number of older drivers in fatal crashes declined 6.96 percent from 2000 to 2006.
- We have no measure of the actual miles traveled by older drivers so the measure of rate per population is only a proxy measurement. Using the rate per population may not provide a true picture of the crash risk to older drivers.

A complicating factor in crashes involving older drivers is that older persons face a greater risk of injury or death in motor vehicle crashes than younger persons due to a greater susceptibility to physical injury. Also older persons may have previous existing medical conditions that added to the traumatic injury can greatly increase the risk of injury or death.



- Persons over age 64 were more often seriously injured or killed in crashes than younger persons. More than twice as many injured persons ages 65-74 were killed compared with persons under age 65. In 2006, 2.58 percent of the injured persons ages 65-74 were killed.

- In 2006, persons over age 74 were almost four times more likely to be killed than younger persons under age 65. Of the persons over age 74 injured, 3.84 percent were killed compared with 1.12 percent for persons under age 65.

- Older drivers often have older passengers. The older person's greater susceptibility to physical injury greatly increases the chance that someone in an older driver's vehicle will be seriously injured or killed in a crash.

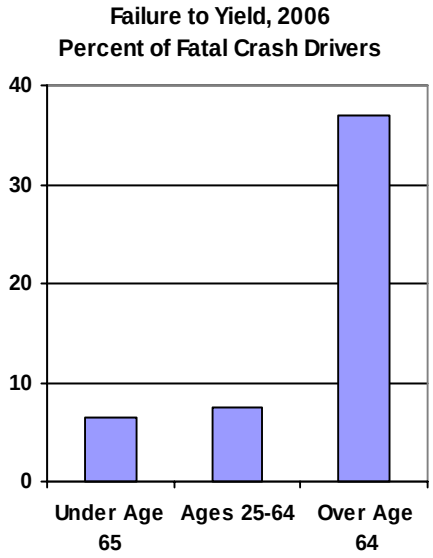
- In crashes in 2006, 41.6 percent of the passengers in the older drivers vehicle were also over age 64. In comparison for all crash occupants only 4.12 percent were over age 64.

- It has been found that older persons have a higher risk of being injured in a crash partly due to a loss of bone density so vehicle interiors need to be designed to accommodate this. Many previous designs were to only the average middle-aged male occupant.

- Declining vision, hearing and reflexes contribute to the potential of a crash although older drivers compensate to some extent for these physical limitations and often self limit their driving. Roadway striping that is faded or worn out and poor signing may pose special difficulties to the older driver, especially at night.

- The lack of adequate funding for EMS and trauma centers is a special problem in rural areas. This deficiency complicates the outcome for older persons who are more susceptible to injury and may have previous existing medical conditions.

One out of four fatal crashes in Georgia occurs at an intersection. The physical limitations faced by older drivers are especially critical at high risk locations such as intersections.



- In 2006, the most frequent contributing factor in fatal crashes involving drivers over age 64 was failure to yield. In comparison, the top contributing factor to fatal crashes for drivers under age 65 was lost control of vehicle.

- For drivers over age 64 in fatal crashes driver lost control was second most frequent contributing factor and following too closely was the third. Failure to yield, following too closely and disregarded stop sign or signal are often involved in intersection crashes.

- Older drivers often have physical challenges due to poor physical mobility such as difficulty turning the head sufficiently to observe traffic on the side or coming from the rear or poor vision. This may be reflected in the high incidence of failure to yield in fatal crashes involving older drivers. In intersection crashes 15.2 percent of the drivers involved in fatal crashes were over age 64. In comparison in all fatal crashes 10.6 percent of the drivers were over age 64.

- Intersections are high risk for drivers of all ages and it is important to put that risk in perspective. Of all fatal crashes in Georgia one out of four is at an intersection and that means preventing these crashes could save about 400 lives each year.

Fatal Crash Contributing Factors
Drivers Number and Percent

	Under Age 65			Over Age 64	
	Number	Percent		Number	Percent
Driver Lost Control	650	33.91	Failure to Yield	72	36.92
Unsafe or Illegal Speed	348	18.15	Driver Lost Control	39	20.00
Wrong Side of Road	205	10.69	Follow Too Closely	16	8.21
Alcohol or Drug Impaired	146	7.62	Wrong Side of Road	15	7.69
Failure to Yield	134	6.99	Disregarded Stop/Signal	13	6.67
Driver Condition	96	5.01	Unsafe or Illegal Speed	10	5.13
Follow Too Closely	63	3.29	Driver Condition	9	4.62
Other	275	14.35	Other	21	10.77
Total	1,917	100.00	Total	195	100.00

Intersections are particularly high risk because they are where multiple vehicles meet coming from many different directions. Driver error compounds the risk. Inattention, unsafe speed, physical difficulties are just a few of the factors that can lead to a crash at an intersection.

- Collisions occurring at an angle are the most frequent manner of collision at intersections. These occur when one vehicle is turning and struck from the side by another. Sixty-one percent of the vehicles in fatal intersection crashes were struck at an angle.

- Crashes occurring at an angle pose the greatest risk of injury or death to the vehicle being struck from the side where there is less protection to the occupant.

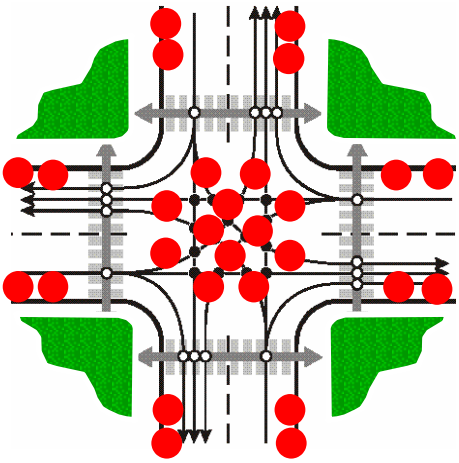
Manner of Collision at Intersection Crashes Drivers in Fatal Crashes, 2006

Manner of Collision	Number	Percent
Angle	553	60.90
Head On	44	4.85
Rear End	50	5.51
Sideswipe Same Direction	25	2.75
Sideswipe Opposite Direction	9	0.99
Not With Another Vehicle	227	25.00
Total	908	100.00

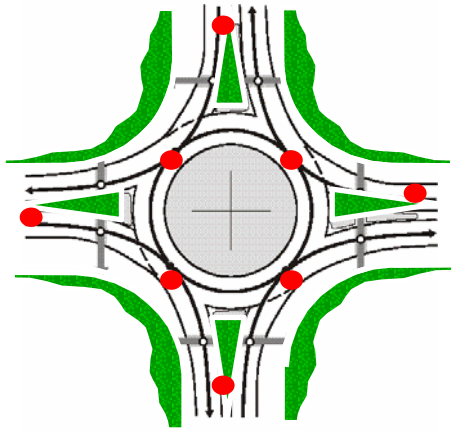
- It is important to first understand the exact factors that increase the crash risk at an intersection before implementing a solution. Depending on the conditions at the intersection one method may be more effective than another.

- The simple and economical addition of a four-way stop reduces turning crashes by reducing speeds, minimizing sight distance limitations and controlling traffic movement. Stop signals also achieve what four-way stops do and can also be used to regulate traffic efficiently thus reducing congestion and subsequent driver stress. Adding a stop sign or signal may not necessarily be the best solution. Installing turn lanes of sufficient length has been shown to significantly reduce crashes, injuries and fatalities.

Conflict Points



Normal Intersection



Modern Roundabout

Another very effective approach is to construct a modern roundabout. They are smaller than old traffic circle, designed for slower entry and exit speeds, always follow a 'yield at entry' rule and have no left turns. Because modern roundabouts reduce speed and have fewer vehicle conflicts there is more time to make decisions and if a crash does occur it is low impact.

From 2000 to 2006, 47,044 people received serious, incapacitating injuries such as traumatic head injuries, paralysis, internal bleeding or other potentially fatal injuries. The majority of trauma centers are in the Atlanta area with very few in the rural counties of Georgia and those are the counties with the higher fatality rates.

Driver lost control was the most frequently noted driver contributing factor in fatal crashes. It has been the most frequent contributing factor for the past 11 years and it leads to serious head on and run-off-road crashes. Off road crashes accounted for 41 percent of all fatal crashes in 2006.

Although teens historically have been thought to have the highest fatality rate they are now third with a fatality rate of 2.9 per 10,000 population. The highest fatality rate was for persons over age 74, 3.4 per 10,000 population. Younger and older drivers are especially at risk although for different reasons. For these drivers the risk increases on the high risk two-way roads where three out of four fatal crashes occur in Georgia.

One out of four fatal crashes in Georgia occurs at an intersection. The physical limitations faced by older drivers are especially critical at high risk locations such as intersections.

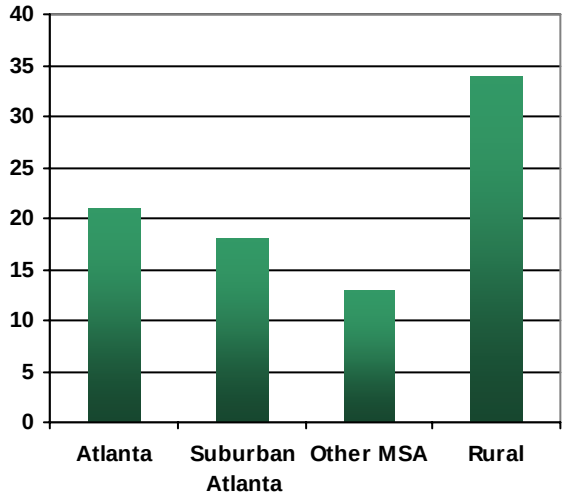
The fatal crash rate for drivers ages 16-17 in rural counties is almost double the fatal crash rate for drivers ages 16-17 in the five Atlanta metropolitan counties. Rural roads have a higher fatal crash rate for all drivers and young drivers are no exception. Rural roads are high risk because they are often narrow, two-lane roads with no physical barrier or division separating oncoming traffic, and have frequent entering and exiting traffic. This greatly increases the risk of a fatal crash and given the propensity of teen drivers for unsafe or illegal speed the result is often fatal.

In 2006, 21 drivers ages 16-17 were involved in fatal crashes in Clayton, Cobb, DeKalb, Fulton and Gwinnett counties, compared with 34 drivers ages 16-17 involved in fatal crashes in rural counties.

For drivers ages 18-20 the number of drivers in fatal crashes in rural counties was more than double the number in the five Atlanta metropolitan counties. In rural counties 86 drivers ages 18-20 were involved in fatal crashes compared with 46 in the five Atlanta counties.

For all age groups rural counties have the highest number of drivers in fatal crashes and the highest driver fatal crash rate.

Number of Drivers Ages 16-17 in Fatal Crashes by Region, 2006



Drivers In Fatal Crashes by Driver Age and Region, 2006
Number and Rate per 10,000 Population

	16-17		18-20		21-24		Over 24	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Atlanta	21	2.15	46	3.65	79	4.52	424	1.94
Atlanta Suburban	18	3.66	37	7.02	38	4.36	318	3.11
Other MSA	13	2.57	34	3.64	49	4.53	355	3.44
Rural	34	4.16	86	7.52	103	6.51	754	4.31

**Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties*

Data excludes bicyclists and pedestrians. The population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

The number of older drivers in fatal crashes in rural counties is almost three times greater than the number of drivers in fatal crashes in the other three regions. In rural areas the lack of accessible public transportation necessitates driving on high risk rural roads. In addition the long distances to emergency care and trauma centers increase the risk of a serious injury leading to death.

The fatal crash rate for drivers ages 65-74 in rural counties is more than double the fatal crash rate for drivers ages 65-74 in the five Atlanta metropolitan counties.

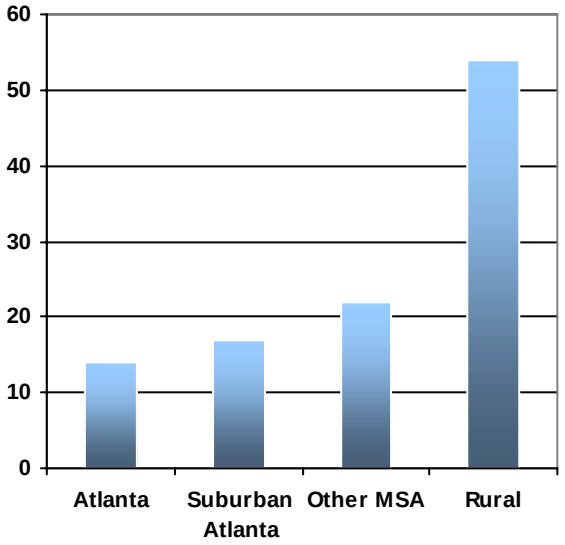
In the 15 suburban Atlanta counties and in the other MSA counties the driver fatal crash rates were higher than the five Atlanta counties for all age groups.

The lowest fatality rate for drivers age 64 and older was in the five Atlanta metropolitan counties.

The combination of high risk roadways and long distances to medical care may account for the higher number of older drivers in fatal crashes.

For all age groups rural counties have the highest number of drivers in fatal crashes and the highest driver fatal crash rate.

Number of Drivers Over Age 74 in Fatal Crashes by Region, 2006



Drivers In Fatal Crashes by Driver Age and Region, 2006
Number and Rate per 10,000 Population

	16-24		25-64		65-74		Over 74	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Atlanta	146	3.67	387	2.00	23	1.58	14	1.27
Atlanta Suburban	93	4.92	276	3.11	25	3.16	17	2.98
Other MSA	96	3.80	298	3.52	35	3.55	22	2.54
Rural	223	6.30	633	4.48	67	3.69	54	3.49

**Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties*

Data excludes bicyclists and pedestrians. Population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven by driver age or gender.

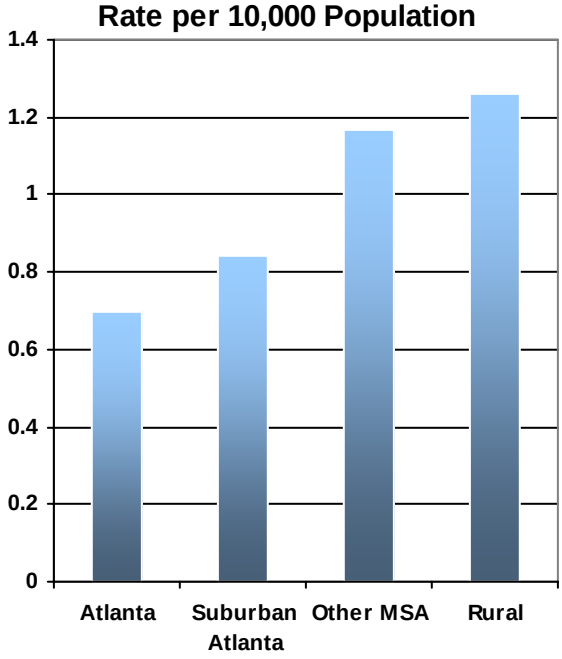
The highest number of fatal intersection crashes occurred in rural counties. Suburban Atlanta counties had the lowest number of fatal intersection crashes.

When the numbers are adjusted by the rate per 10,000 population the intersection driver fatal crash rate in rural counties was 39 percent higher than the intersection driver fatal crash rate in the five Atlanta metropolitan counties.

The second highest intersection driver fatal crash rate occurred in metropolitan statistical areas other than Atlanta.

The lowest intersection driver fatal crash rate was in the five Atlanta metropolitan counties.

Drivers in Fatal Intersection Crashes by Region, 2006
Rate per 10,000 Population



Drivers in Fatal Intersection Crashes by Region
Number of Drivers and Rate per10,000 Population

	Intersection		All Fatal Crashes	
	Number	Rate	Number	Rate
Atlanta	238	0.70	602	1.78
Suburban	133	0.84	423	2.66
Other MSA	195	1.17	473	2.85
Rural	342	1.26	1,017	3.74

**Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties*

Over one third of the drivers in fatal crashes were in crashes at intersections and the majority of these crashes occurred in rural counties.

When adjusted for the number of people rural counties still represented a higher risk for fatal intersection crashes. The rural county driver fatal intersection crash rate per 10,000 population was 80 percent higher than the rate for the five Atlanta metropolitan counties.

In many counties high speed state and county routes intersect. This greatly increases the chances of two vehicles meeting at high speed.

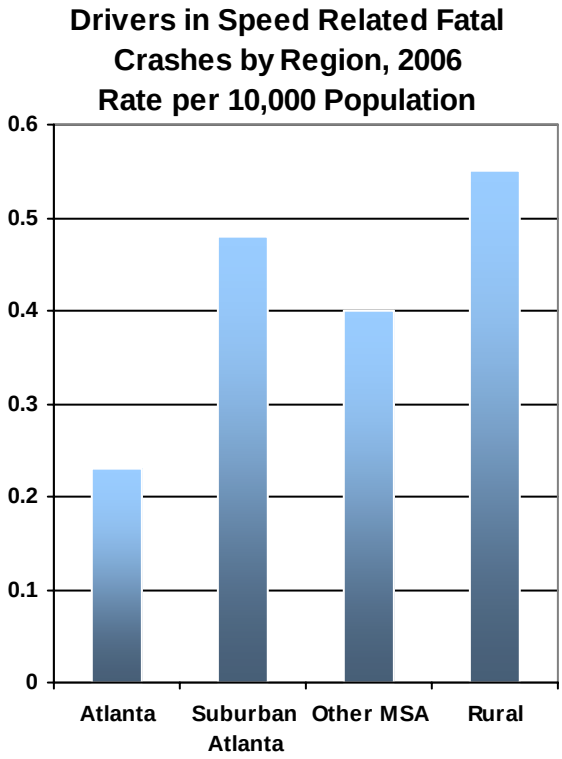
Data excludes bicyclists and pedestrians. Population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven.

One out of six fatal crashes in Georgia in 2006 was related to illegal or unsafe speed. Forty percent occurred in rural counties compared with 21 percent in the five Atlanta metropolitan counties.

The speed related fatal crash rate per 10,000 population in rural counties was more than double the speed related fatal crash rate in the five Atlanta metropolitan counties.

From 2000 to 2006 the number of illegal or unsafe fatal crashes increased in the Atlanta suburban counties, counties in other metropolitan areas and rural counties.

In the five Atlanta metropolitan counties the number of fatal crashes related to illegal or unsafe speed remained about the same although the rate per 10,000 population declined.



Drivers in Speed Related Fatal Crashes by Region
Number and Rate per 10,000 Population

	2000 Number	2000 Rate	2006 Number	2006 Rate	Percent Change in Number	Percent Change in Rate
Atlanta	79	0.27	78	0.23	-1.27	-14.61
Atlanta Suburban	54	0.45	77	0.48	42.59	8.54
Other MSA	45	0.29	66	0.40	46.67	37.55
Rural Counties	141	0.56	149	0.55	5.67	-1.77

**Pre-2003 census definition was used. Five Atlanta Metropolitan Counties: Clayton, Cobb, DeKalb, Fulton, Gwinnett; Atlanta Suburban Counties: Barrow, Bartow, Carroll, Cherokee, Coweta, Douglas, Fayette, Forsyth, Henry, Newton, Paulding, Pickens, Rockdale, Spalding, Walton; Other Metropolitan Statistical Area (MSA) Counties: Bibb, Bryan, Catoosa, Chatham, Chattahoochee, Clarke, Columbia, Dade, Dougherty, Effingham, Harris, Houston, Jones, Lee, Madison, McDuffie, Muscogee, Oconee, Peach, Richmond, Twiggs, Walker; Rural Counties: All other counties*

In July 1996, the speed limit was increased to 70 mph on rural interstates. Three years later the number of fatalities on rural interstate roads increased 67.5 percent when compared to the three-year period before the speed limit was raised.

Data excludes bicyclists and pedestrians. Population is used as a proxy measurement of risk exposure. We do not have a measure of actual miles driven.

Rural roads are high risk because they are often narrow, two-lane roads with no physical barrier or division separating oncoming traffic, and have frequent entering and exiting traffic. This greatly increases the risk of a fatal crash. Drivers need to understand the road characteristics that increase the risk and adjust their driving accordingly.

For all age groups rural counties have the highest number of drivers in fatal crashes and the highest driver fatal crash rate.

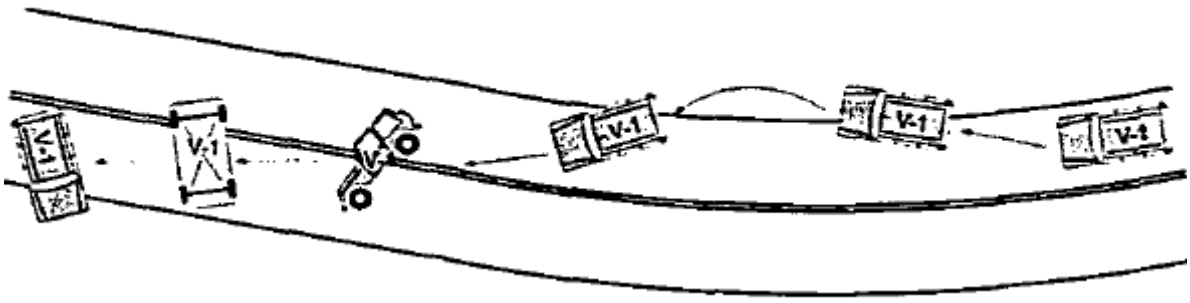
The number of older drivers in fatal crashes in rural counties is almost three times greater than the number of drivers in fatal crashes in the other three regions. In rural areas the lack of accessible public transportation necessitates driving on high risk rural roads. In addition the long distances to emergency care and trauma centers increase the risk of a serious injury leading to death.

The chance of being seriously injured is three times higher in crashes related to speed than crashes not related to speed. One out of six fatal crashes in 2006 was related to illegal or unsafe speed. Forty percent occurred in rural counties compared with 21 percent in the five Atlanta metropolitan counties.

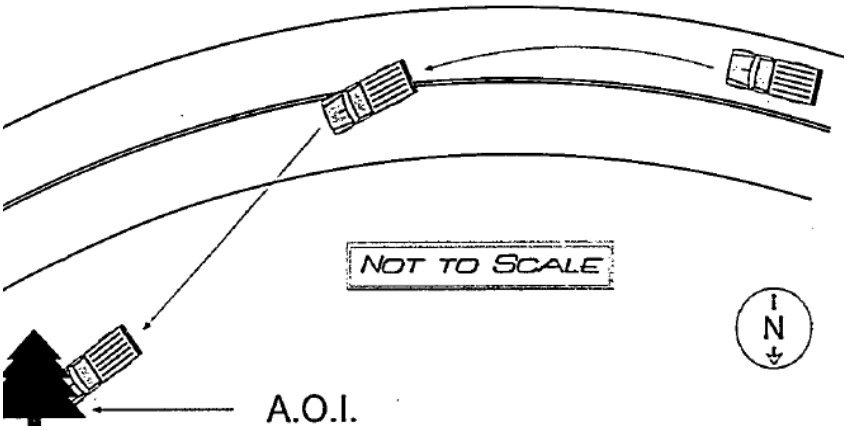
In doing research for this document I read the narratives from the 1,562 fatal crash reports for 2006. Over and over I read the same words – two-way road no separation, driver lost control, negotiating a curve, too fast for conditions, overcorrected, county or state route in a rural county. My observations are confirmed by the data but still I was shocked by these conditions being repeated over and over and over again. There are reasons for these fatal crashes and we know what they are and we can address them given the resources.

In this driver section we have seen how driver factors meet road conditions and how drivers can meet death on high risk roads. There are many recommendations to drivers as to how to avoid crashes. But from these narratives and from the data one stands out –pay attention and be aware of the road you are on or in other words think as you drive. If you are approaching a curve slow down. Don't be seduced by the tranquility of the two-way country road; remember that is where in Georgia three out of four people die. Pay particular attention to intersections where vehicles meet and always expect the unexpected.

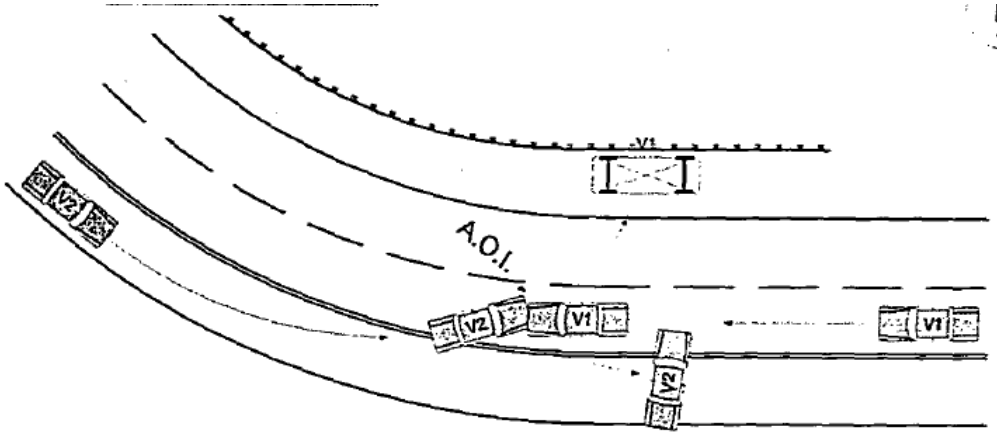
If the data and my words don't convince you below are just a few of the fatal crash reports and diagrams written by law enforcement officers at the scene of a fatal crash. Perhaps they will make you think. If you don't think of anything else think of the emergency medical technician that must fight for your life, the firefighter that may spend 20 minutes extricating you out of your vehicle and the officer or emergency department doctor that must tell your family you have died.



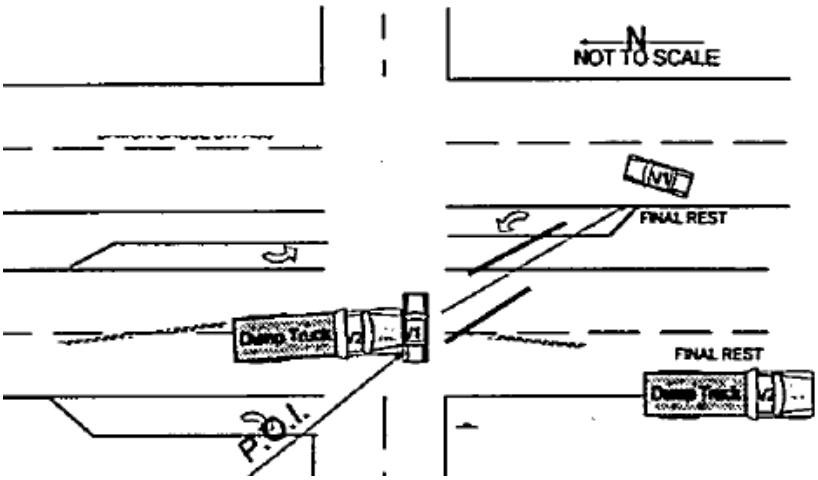
I was called to a single vehicle collision in the 700 block of E Vehicle 1, a black 1998 Chevrolet S 10 Blazer, had overturned while negotiating a curve. Subsequent investigation revealed vehicle 1 had been traveling east on [illegible] at a speed too fast for the curve. As the vehicle entered the curve the rear of the vehicle became unstable and the driver began to lose control of the vehicle. When the rear tire of the vehicle left the pavement, it dug into the softer dirt and caused the vehicle to flip. Vehicle 1 then came to rest on its roof, pinning the driver in the vehicle. A coroner's report has yet to be filed by the coroner's office, and this report should declare the cause of death of the driver.



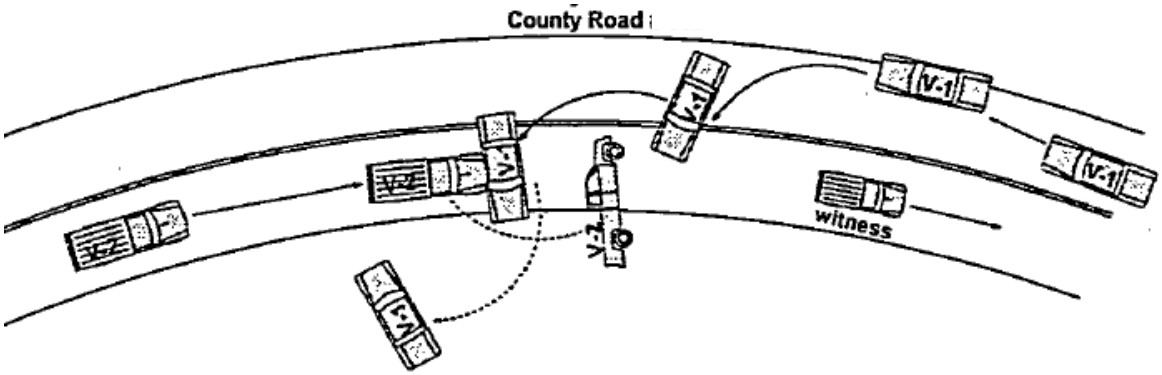
Vehicle #1 was traveling east on the inside traffic lane attempting to negotiate the curve. Driver #1 traveling too fast lost control of the vehicle. Vehicle #1 traveled through the median and crossed both westbound lanes o . Vehicle #1 traveled through the north ditch up the ditch embankment and struck several trees with its front end. Area of impact was on the north ditch embankment.



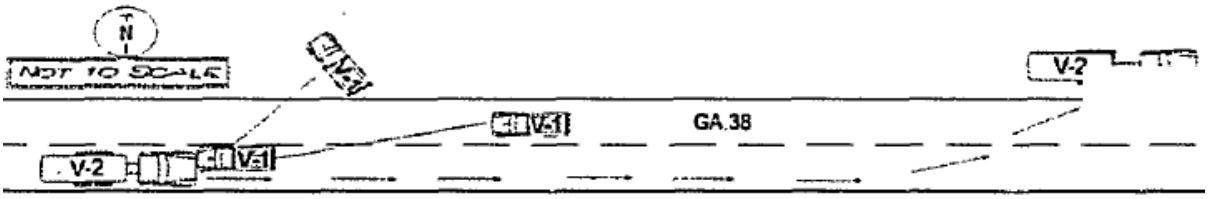
Vehicle #2 was traveling west on and was negotiating a curve. Vehicle #1 was traveling east o and was approaching the curve. Driver of vehicle #2 lost control and crossed the yellow center line striking vehicle #1 head on. After impact vehicle #1 overturned and came to rest on it's top on the south shoulder o . Vehicle #2 rotated counter clockwise and came to rest in the westbound lane o Area of impact was in the left passing lane of eastbound.



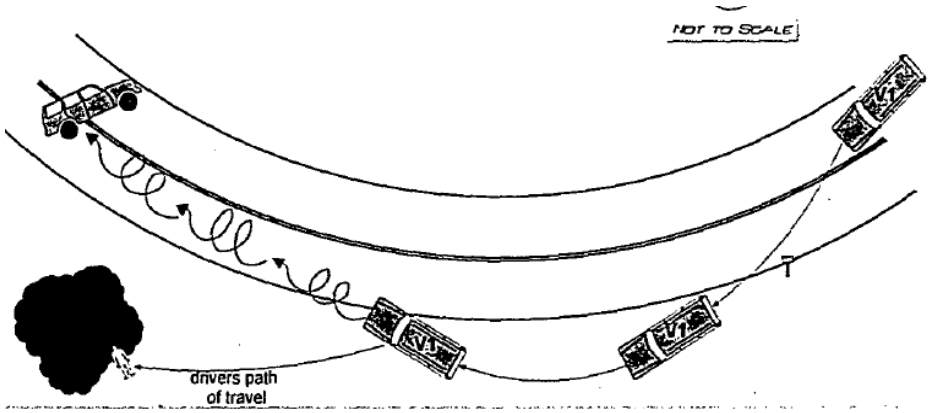
DRIVER 1 WAS TRAVELING EAST ON) AND ATTEMPTED TO CROSS O THE DRIVER STOPPED AT THE STOP SIGN BUT THEN PROCEEDED TO PULL INTO THE ROADWAY AND INTO THE PATH OF A GRAVEL TRUCK TRAVELING SOUTH ON S. VEHICLE 1 WAS STRUCK IN THE DRIVERS SIDE DOOR BY THE GRAVEL TRUCK WHICH RESULTED IN THE DEATH OF DRIVER 1 AND A FRONT SEAT PASSENGER.



Vehicle #1 was traveling west on _____. Vehicle #2 was traveling east on _____. Vehicle #1 ran off of the north roadway edge for approximatley 135 feet 2 inches while negotiating a curve. The driver of vehicle #1 overcorrected the maneuver and vehicle #1 re-entered the roadway rotating counterclockwise. Vehicle #1 traveled 89 feet 11 inches and was struck in the right side by the front of vehicle #2. After impact, vehicle #1 rotated clockwise and traveled 21 feet 10 inches to final rest on the south shoulder of . After impact, vehicle #1 overturned and traveled 27 feet 4 inches to final rest. The area of impact was in the eastbound lane of .



Vehicle 1 was traveling west on Vehicle 2 was traveling east on According to witnesses and driver of Vehicle 2, Vehicle 1 crossed over the centerline striking Vehicle 2 in the eastbound traffic lane of Area of impact was 5 feet 1 inch north of the south edge of (After impact Vehicle 1 skidded 181 feet 5 inches to an uncontrolled rest on the north shoulder of After impact Vehicle 2 skidded 394 feet 6 inches to rest on the north shoulder



Vehicle 1 was traveling west on . Vehicle 1 was traveling too fast to negotiate the curve and left the roadway, traveling onto the south shoulder. Vehicle 1 traveled approximately 185 feet before re-entering the roadway where it began to overturn. Vehicle 1 overturned 6 times, ejecting the driver of Vehicle 1. Vehicle 1 came to final rest in the center of the roadway on its right side, facing northeast. The driver of Vehicle 1 came to final rest at the base of a group of trees adjacent to the south edge of the roadway.

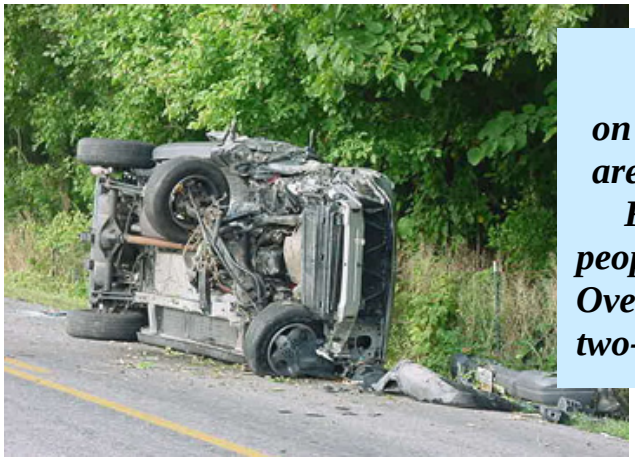
Anticipate……. that car will not stop for the stop light, rain will make the roads slick, you are going too fast for the curve, the driver weaving all over the road will turn into your lane, drivers turn without signaling and signal with out turning and know you that are not the perfect driver you think you are.

Driving our high risk roads:

Pay attention and stay alert
Anticipate the unexpected
Watch the cars around you
Avoid distractions
Be aware of your surroundings
Don't take chances
Slow down on curves
Slow down when in doubt
Slow down
Concentrate on driving
Look when changing lanes
Look when you turn
Use your seat belt
Use turn signals
Follow traffic rules religiously
Don't drive tired, stressed or angry and be considerate
Turn lights on at dawn & dusk
Turn lights on in rain
Avoid left turns if possible
Watch out for pedestrians
Move to right, slow down and stop for emergency vehicles
Know your vehicle
Keep your vehicle running right
Keep windshield, windows & mirrors clear

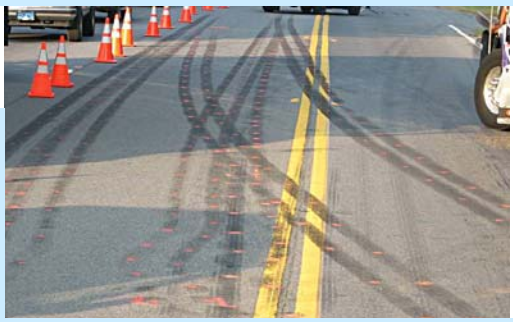
I remember when I was in high school, a state patrol officer spoke to my class about seatbelts. He told us that in his entire history, he had never had to unbuckle a dead person. At the time, it made quite an impact and I began using my seatbelt with regularity. But 21 years later, and as a veteran paramedic, I realize the futility of his argument. I have unbuckled plenty of dead people. Now don't get me wrong, I believe in the value and utilization of modern safety equipment. But for so long, we basically told American kids that as long as they wore their seat belt, they would be "safe". This argument implies that vehicular safety design can forgive irrational or downright stupid decisions made by drivers. Of course we know this to be false. I am amazed every time I pull up to a fatality accident and see that we, as humans, have really invented no new ways of killing ourselves. We just keep finding new spins on old themes. The same mistakes that cost lives in the first automobiles are still at work today. I always leave with sorrow and regret for the wasted humanity that could have been a longer life had but one link in the accident chain been broken. I marvel at the frank stupidity of some act of aggression that goes horribly wrong. I also cry along with the family for the senseless loss of an innocent child. I just don't do it in front of them. I guess that's the hardest part in all of this. The control that is required to remain objective and task oriented takes a tremendous toll on the individual. We were created to share and display emotion, yet our job demands that we remain focused and task-oriented during the most heart wrenching times of our lives. This dichotomy is perhaps the defining emotive crisis that surrounds EMS personnel at these incidents.

Commander Steven G. Folden, Paramedic, EMS Educator
Fayette County Department of Fire & Emergency Services



Three out of four fatal crashes occurred on two-way roads with no separation. They are the highest risk roadways.

From 2000 to 2006 in Georgia, 11,435 people lost their lives in motor vehicle crashes. Over 8,500 men women and children died on two-way roads with no separation.



From 2000 to 2006 over 4 million drivers have been involved in crashes resulting in almost a million injuries. That is on average 1,720 drivers each day – 72 drivers every hour. In 2006 alone 1,703 men, women and children lost their lives on Georgia's roadways. In 2006 alone the number of injured children ages 5-9 would fill not 10 classrooms, not 50 classrooms but 128 classrooms. For middle school age children ages 10-14 the number is even greater. The number of injured children ages 10-14 in 2003 would fill 148 Georgia classrooms.

For all age groups rural counties have the highest number of drivers in fatal crashes and the highest driver fatal crash rate. The fatal crash rate for drivers ages 16-17 in rural counties is almost double the fatal crash rate for drivers ages 16-17 in the five Atlanta metropolitan counties. The number of older drivers in fatal crashes in rural counties is almost three times greater than the number of drivers in fatal crashes in the other three regions. In rural areas the lack of accessible public transportation necessitates driving on high risk rural roads. In addition the long distances to emergency care and trauma centers increase the risk of a serious injury leading to death.

Unsafe or illegal speed is involved in one out of six fatal crashes in Georgia and forty percent of these fatal crashes occurred in rural counties. The chance of being seriously injured is three times higher in crashes related to speed than crashes not related to speed.

Horizontal curves are one of the major road characteristics that increase the risk of speed related crashing. In 2006, one out of two fatal off road crashes happened on a curve although straight roadways segments far outnumber curved roadway segments.

From 2000 to 2006, 49.6 percent of the fatal fixed object crashes occurred in rural counties. The disparity was even greater for overturn crashes, 62.2 percent occurred in rural counties. Off road fatal crashes accounted for 41 percent of all fatal crashes in Georgia in 2006. Overturn and fixed object crashes pose the highest risk of injury or death to the vehicle occupants.

One out of three fatal crashes in Georgia in 2006 occurred on off-system roads and almost all of these fatal crashes were on two-way roads without any separation. Of the off road fatal crashes on two-way off-system roads 62 percent were on horizontal curves.