

The Anatomy of a Crash

Some of us lack the training or experience to prepare for a sudden emergency behind the wheel. When we don't know how to react, our conscious mind checks out, leaving the driving to the subconscious.

Often, panic sets in and we freeze and that's when it happens — a Crash!!

It takes only 2 to 3 seconds to buckle a safety belt ... and less than one second to die if you don't buckle up.

Contact us:
www.labor.vermont.gov

- * Under "Business" click "Workplace Safety"
- * Then click "Project RoadSafe"



A FATAL CRASH IN LESS THAN A SECOND *(without a seat belt)*

0:00.1: Front bumper and grill collapse as the vehicle makes contact with stationary solid object.

0:00.2: Hood crumples, striking windshield, rear wheels lift from the ground, fenders wrap around object. Car frame has halted, but your unrestrained body is still going 55 mph. Legs stiffen against the crash and snap at the knee joint.

0:00.3: The steering wheel starts to disintegrate as your chest is propelled toward the steering column. The airbag deploys.

0:00.4: Two feet of the car's front end is wrecked. The rear end still moves at 35 mph, and your body continues traveling at 55 mph.

0:00.5 Your torso slams into the airbag, the impact causing your internal organs to "slam" around inside your body.

0:00.6 The impact builds. The car frame buckles in the middle and your unstrained self bounces sideways off the airbag as the rear wheels, still spinning, fall back to earth.

0:00.7: Hinges rip loose, doors open, and the seat breaks free, striking you from behind and the last three tenths of a second mean nothing to you because you are now **DEAD!**

Project Road-Safe
Norman James, Manager
Vermont Department of Labor
P.O. Box 488
5 Green Mountain Drive
Montpelier, VT 05602
802-828-4172
norman.james@state.vt.us

Project Road-Safe

*(A Workplace Traffic Safety
Program)*

The Anatomy of A Crash



*Traffic Crashes
Increase The Cost of
Doing Business*



The Anatomy of a Crash . . In Less Than A Second!

This is what happens during a typical crash — In less than a second!

1) Recognition: Driving along with the stereo playing or thinking about all that needs to be done that day and suddenly something unexpected happens in front of you. The car ahead has stopped dead in its tracks.

2) Reaction: As a reflex, you go into a fight-or-flight mode. The heart rate goes up because the body needs more oxygen. Capillaries contract to hold blood near the core where it will be needed to protect vital organs. Breathing increases. ***Just before any action is taken, the adrenal gland opens and fires a shot of adrenalin throughout your body. Now you are five times stronger than you were a millisecond ago.***



3) Response: With that heightened state of strength and readiness, the biggest muscle in the body, the gluteus maximus, locks down on the brake pedal, causing the tires to lock up. ***Everything else is locked up as well. Your hands and elbows lock on the steering wheel, and your eyes lock on the vehicle ahead, increasing the chances of hitting it.***

4) Weight Transfer: Upon slamming on the brakes, the weight in the vehicle chassis starts to shift to the front. Front springs collapse with the rear springs extending, causing the rear tires to have no weight on them; the burden is now on the front tires. Ultimately however, the front tires will begin to give up and start to slide.

5) Coefficient of Friction: Because the front tires are locked up and sliding, their temperature has risen to approximately 2000 degrees. The effect is similar to sliding along on molten rubber. That is what causes the two parallel black marks you see on the highway all the time. In this case, turning the wheel wouldn't be a benefit because with the tires melting you might as well be on ice.

6) The Crash Then The Silence: Next comes the crash and the realization of the preceding events, followed by a deafening silence.

Vermont Crash Notes

- More than 70% of fatal crashes happened in rural areas.
- More than 70% of all fatal crashes happened in the 50+ mph posted speed ranges.
- More than 50% of all people killed in a crash were not wearing a seatbelt.
- More than 50% of fatal crashes involved a single vehicle.
- 90% of all crashes were caused by operator actions.
- Primary reasons for crashes are speed, operator inattention, failure to yield, and following too closely.



Project RoadSafe