



Phases of a Crash

OFFICER TYLER TIBBITTS #3333
FRISCO POLICE DEPARTMENT

25 Years Today

2



25 Years Today

3



25 Years Today

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- ▶ WTC- 2753 Deaths
- ▶ Pentagon- 125 Deaths
- ▶ Shanksville, PA- 40 passengers United 93
- ▶ All Planes- 246 Deaths
- ▶ Firefighters- 343 Deaths
- ▶ Police Officers- 23 Deaths NYPD 37 Deaths Port Authority PD

Total 2977 deaths

About me

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- ▶ Bridge City High School – August 2002 – May 2006
- ▶ Lamar Institute of Technology (Police Academy) August 2008-January 2009
- ▶ Beaumont Police Department – August 2008-January 2011
 - ▶ Patrol Division 2009-2011
 - ▶ 2009 Rookie of the Year
- ▶ Frisco Police Department – January 2011-Present Day
 - ▶ Patrol Division 2011-2014
 - ▶ Traffic Division 2014-Present Day
 - ▶ 2020 Chief's Award Recipient

My Training

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- ▶ Master Peace Officer Certification
- ▶ Intermediate Accident Investigation
- ▶ Advanced Accident Investigation
- ▶ Collision Reconstruction
- ▶ Basic Instructor Certification
- ▶ Master LASER and RADAR instructor
- ▶ National Academy of Professional Driving Instructor-Tactical Driving Course
- ▶ National Academy of Professional Driving Instructor-SUV Operator's Course
- ▶ Texas A&M Engineering Extension- EVOC Driving Instructor
- ▶ Texas A&M Engineering Extension- Police Motorcycle Instructor
- ▶ Basic Investigator
- ▶ American College of Sports Medicine Personal Trainer
- ▶ 2018 Texas DPS Fitness Institute Graduate
- ▶ Forced Entry Tactical Master Breacher
- ▶ Advanced Instructor Certification
- ▶ Simunition Instructor
- ▶ Advanced SWAT
- ▶ Commercial Motor Vehicle Inspector/Weight Enforcement Officer

No Conflict-of-Interest Declaration

Content Warning:

The following video contains material that may be harmful or traumatizing to some audiences.



Sources:

- ▶ Texas Department of Transportation
- ▶ U.S. Department of Transportation
- ▶ Arizona Department of Transportation
- ▶ YouTube and Google
- ▶ Personal Experience

Why do we do what we do?

Why do we do what we do?

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Phases of a Crash

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Phases of a Crash

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▶ Three phases we will look at today.

1. The crash occurs.

2. At scene investigation.

3. Post crash investigation.

The Crash Occurs

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Is it a crash or an accident?

Crash Occurs

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- ▶ Why is it not an “Accident”?

- ▶ ACCIDENT Definition & Meaning - Merriam-Webster

Crash Occurs

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- ▶ A crash is due to or caused by contributing factors.

CRASHES ARE PREVENTABLE!!

05-13-2015



that started as a home invasion,
cops say, followed by a police chase.

INSIDE
EVIDENCE

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CAUGHT ON DASH CAM



CZECH REPUBLIC POLICE VILSTOVYLA



Crash Occurs

- ▶ Crashes occur for many reasons
 - ▶ Distracted driving
 - ▶ Drunk or drugged driving
 - ▶ Disregarding traffic control devices
 - ▶ Criminal occurrences
 - ▶ Mechanical
 - ▶ And the list goes on and on.....

Crash Occurs

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Crash Occurs

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- ▶ Texas Crashes:
 - ▶ 2024 Data
 - ▶ TXDOT Annual Report



Crash Occurs

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DEHOYOS ACCIDENT ATTORNEYS

HOUSTON, TX

TEXAS TRAFFIC SAFETY — 2024 DATA

MOST COMMON TEXAS CRASH CAUSES

**FAILURE TO CONTROL SPEED**

Driving too fast for road, weather, or traffic conditions — even when under the posted speed limit. The leading contributing factor in Texas crash reports.

**DRIVER INATTENTION**

Texting, eating, adjusting the radio, or any activity that pulls focus from driving. Distracted driving is chronically underreported in official crash data.

**FAILURE TO YIELD RIGHT OF WAY**

Running stop signs, failing to yield when turning left, or ignoring traffic signals at intersections — a top cause of broadside and angle crashes.

**FOLLOWING TOO CLOSELY**

Tailgating that prevents safe stopping when traffic slows or stops suddenly. Rear-end collisions are among the most common and preventable crash types in Texas.

**UNSAFE LANE CHANGES**

Switching lanes without checking blind spots or using turn signals. Especially dangerous on Houston highways where traffic moves fast and lanes are congested.

**DRIVING UNDER THE INFLUENCE**

Alcohol or drug impairment that slows reaction time and severely impairs judgment. Drunk driving accounted for over 26% of all Texas traffic fatalities in 2024.

Note: These factors appear repeatedly in Texas crash reports because they represent choices drivers make that put others at risk. If another driver's negligence caused your crash, you may be entitled to compensation.

FREE CONSULTATION • NO FEE UNTIL WE WIN
CONTACT US TO SCHEDULE A FREE CONSULTATION

(832) 745-4878

Crash Occurs

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TEXAS TRAFFIC SAFETY — 2024 DATA

WHEN TEXAS CRASHES HAPPEN MOST



PEAK CRASH WINDOW

3:00 PM – 8:00 PM

The highest number of crashes occur during weekday rush hour. Heavy traffic, tired drivers, and distracted commuters combine to create the most dangerous period on Texas roads.



DEADLIEST HOUR

2:00 AM – 3:00 AM

The single most deadly hour on Texas roads. Impaired and fatigued drivers dominate this window, with far fewer vehicles on the road to provide witnesses or early crash detection.



WORST MONTH OF 2024

October — 391 Deaths

October 2024 was the deadliest month in Texas, with 391 traffic fatalities. The two deadliest single days were May 24 and October 27 — each claiming 27 lives.

HOLIDAY DANGER

Thanksgiving

Thanksgiving week and New Year's Eve consistently rank among the most dangerous travel periods in Texas each year.

WEEKEND PATTERN

Fri–Sun

Friday through Sunday see the most fatal crashes, driven by alcohol consumption, late-night driving, and increased recreational travel.

Crash Occurs

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Crash Occurs

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TEXAS TRAFFIC SAFETY — 2024 DATA

SEAT BELT SAFETY FACTS



CRITICAL FINDING — 2024

Nearly half of all people killed in Texas crashes were not wearing a seat belt at the time of the crash.

45%

DEATH RISK REDUCED

Seat belts reduce the risk of dying in a crash by 45% for front seat passengers in cars.

50%

INJURY RISK REDUCED

Seat belts cut the risk of serious injury by 50% — the most effective safety device in any vehicle.

~50%

KILLED UNBUCKLED

Of Texas crash fatalities in 2024 were not restrained — despite a statewide belt usage rate exceeding 90%.

Texas law requires all passengers to wear seat belts. If you were injured in a crash while buckled, Texas's modified comparative fault rules mean an unrelated failure to buckle cannot reduce your claim — contact us to understand how this affects your case.



COMPARISON OF MOTOR VEHICLE TRAFFIC DEATHS, VEHICLE MILES, DEATH RATES, AND ECONOMIC LOSS 2003 - 2025

YEAR	DEATHS	% INCREASE OR % DECREASE (DEATHS)	VEHICLE MILES TRAVELED (VMT) (MILLIONS)	% INCREASE OR % DECREASE (VMT)	DEATHS PER 100,000,000 VEHICLE MILES TRAVELED	ESTIMATED ECONOMIC LOSS OF ALL MOTOR VEHICLE CRASHES**
2003	3,822	-0.03%	218,209	1.08%	1.75	\$20,700,000,000
2004	3,700	-3.19%	229,345	5.10%	1.61	\$19,400,000,000
2005	3,558	-3.84%	234,231	2.13%	1.52	\$19,200,000,000
2006	3,521	-1.04%	236,486	0.96%	1.49	\$20,400,000,000
2007	3,462	-1.68%	241,746	2.22%	1.43	\$20,600,000,000
2008	3,479	0.49%	234,593	-2.96%	1.48	\$22,900,000,000
2009	3,122	-10.26%	231,976	-1.12%	1.35	\$21,300,000,000
2010	3,060	-1.99%	234,261	0.98%	1.31	\$22,300,000,000
2011	3,068	0.26%	237,443	1.36%	1.29	\$23,400,000,000
2012	3,417	11.38%	237,821	0.16%	1.44	\$26,000,000,000
2013	3,407	-0.29%	244,536	2.82%	1.39	\$27,800,000,000
2014	3,538	3.85%	242,989	-0.63%	1.46	\$38,100,000,000
2015	3,585	1.33%	258,122	6.23%	1.39	\$36,700,000,000
2016	3,794	5.83%	271,263	5.09%	1.40	\$38,800,000,000
2017	3,727	-1.77%	272,981	0.63%	1.37	\$39,400,000,000
2018	3,657	-1.88%	282,037	3.32%	1.30	\$39,700,000,000
2019	3,622	-0.96%	288,227	2.19%	1.26	\$40,400,000,000
2020	3,898	7.62%	260,580	-9.59%	1.50	\$44,600,000,000
2021	4,456	14.32%	285,028	9.38%	1.56	\$55,600,000,000
2022	4,410	-1.03%	290,891	2.06%	1.52	\$57,800,000,000
2023	4,291	-2.70%	301,254	3.56%	1.42	\$58,800,000,000
2024	4,159	-3.08%	308,480	2.40%	1.35	\$59,900,000,000
2025	3,769	-9.38%	314,006	1.79%	1.20	\$54,200,000,000

**Economic Loss figures are estimated using the National Safety Council's (NSC) Average Economic Cost on a per death basis figure for the year identified. Figures are rounded to the nearest hundred million. 2025 figures are based on 2024 cost.

2024 and 2025 information contained in this report represents reportable data collected from Texas Peace Officer's Crash Reports (CR-3) received and processed by the Department as of April 7, 2026.

At Scene Investigation

At Scene Investigation

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▶ Initial response:

- ▶ Fire
- ▶ EMS
- ▶ Police

▶ Secondary response:

- ▶ Streets department
- ▶ Signals control department
- ▶ Tow truck

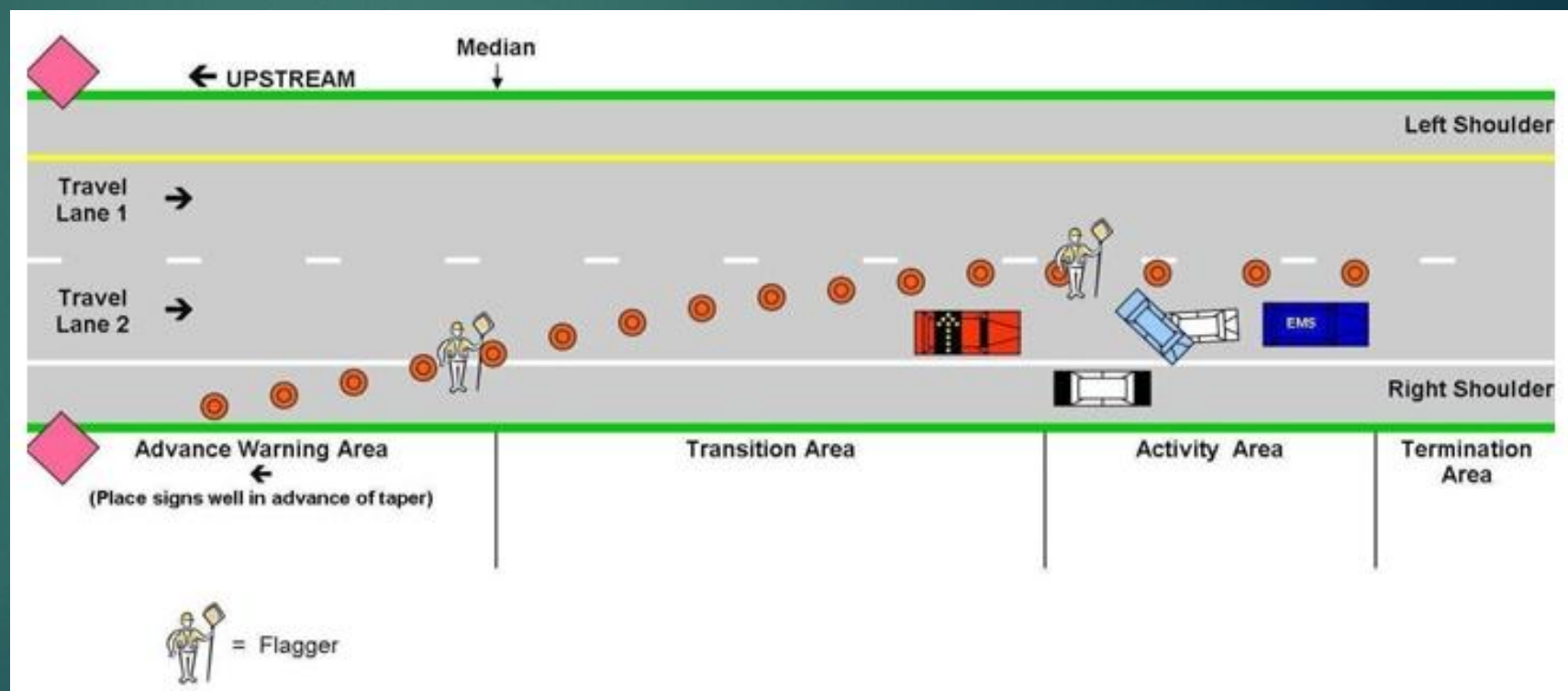
At Scene Investigation

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Safety and security is most important!!!!



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At Scene Investigation

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TRAFFIC INCIDENT MANAGEMENT:

QUICK CLEARANCE

FENDER BENDER?
If you're in a minor or non-injury crash and your vehicle is operable, move it out of travel lanes.

Why move your vehicle out of travel lanes?

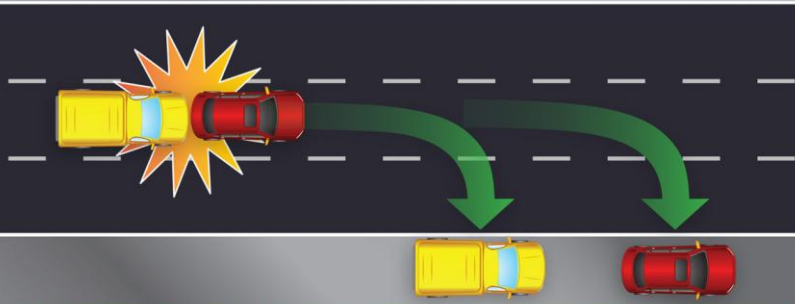
- Driver Safety
- Traveler Safety
- Responder Safety
- It's the Law!
A.R.S. 28-674

Move your vehicle to the side of the road and inspect it there – not in dangerous travel lanes.

Often, a primary crash leads to a traffic backup and increases the risk of a secondary crash, which can be more severe than the original collision.

Vehicles involved in a non-injury crash that remain operable, according to Arizona law, must be removed from the roadway.

Emergency responders – police, fire, tow truck operators, etc. – need a safe place to work, too.
On average, a tow truck operator is struck and killed every six days in the U.S.



ADOT

At Scene Investigation

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- ▶ What type of crash are we investigating?
 - ▶ Minor crash with no injuries
 - ▶ Major crash with no injuries
 - ▶ Major crash with injuries
 - ▶ Major crash with serious injuries or death

At Scene Investigation

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- ▶ Minor or major crash with no injuries
 - ▶ Collecting the needed information for a report.
 - ▶ Determining contributing factors
 - ▶ Exchanging driver information.
 - ▶ Trying to get road opened as soon as possible.



At Scene Investigation

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- ▶ Major crash with injuries.
 - ▶ Collecting same information as a minor or major crash with no injuries.
 - ▶ Making sure injured parties are getting medical attention.
 - ▶ If parties are being transported for medical attention, where?
 - ▶ Calling for wreckers to tow damaged vehicles.
 - ▶ Determining how long till road is open and not impacting traffic flow.



At Scene Investigation

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- ▶ Major crash with serious injury or death.
 - ▶ Shutting down the road and re-routing traffic.
 - ▶ Knowing it may be shut for extended time, trying to cause the least negative impacts with road closures and diversions.
- ▶ Determining if a Traffic Crash Investigator needs to be called.
- ▶ Is there a possible criminal offense that could come from the crash?

At Scene Investigation

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- ▶ The decision has been made to call for a Traffic Crash Investigator?
 - ▶ Traffic Crash Investigator
 - ▶ Specialized crash investigation training.
 - ▶ Typically, 5-6 weeks of specialized training relating to crash investigation.
 - ▶ Approximately 200-240 hours of training for the basic principles of crash reconstruction.
 - ▶ Can take specialty investigator courses (Pedestrian, Commercial Vehicle, and others).

At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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- Advances in technology to document a scene



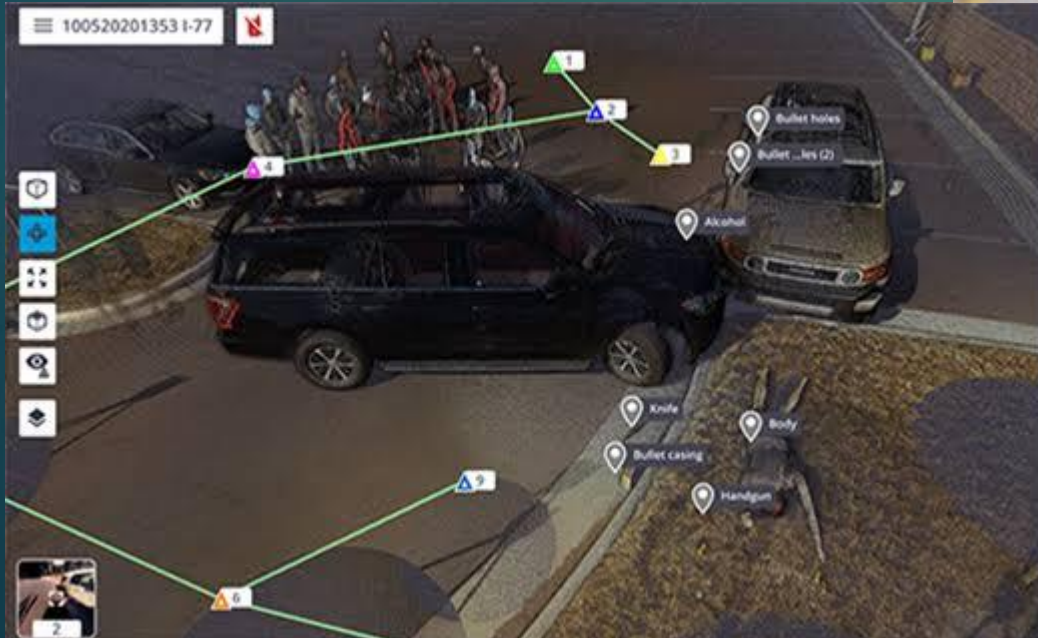
At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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- ▶ 3D Scanner provides a point cloud environment to document the scene



At Scene Investigation

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Evidence at a crash scene's worst enemy?

At Scene Investigation

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The evidence destruction squad.



At Scene Investigation

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- ▶ In the 3D point cloud environment:
 - ▶ Measurements can be taken.
 - ▶ Angles can be determined.
 - ▶ Different points of view can be seen.
 - ▶ Animations can be created.
 - ▶ This information helps investigators to determine speeds, and other factors present during the crash.

At Scene Investigation

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- ▶ Drone Mapping
 - ▶ We can also use drones to do the same mapping as a 3D Scanner
 - ▶ The two separate point clouds can be merged.
 - ▶ Allows for even better documentation of a scene.

At Scene Investigation

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► Drone Mapping



At Scene Investigation

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- ▶ Technology recap

- ▶ Sokia Total Station, 100-250 points of data in 3.5 – 5 hours.
- ▶ 3D Scanner/Drone mapping, millions of points in 1.5-2.5 hours.
- ▶ Technology is allowing us to get scene documented more accurately!
- ▶ We also open roadways faster.

At Scene Investigation

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- What are we documenting?



At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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At Scene Investigation

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- ▶ Review:
- ▶ We only get to be at the crash scene once.
- ▶ We don't like having the road shutdown for hours, but we only get one shot at capturing evidence that may be important.
- ▶ We are diligent in evidence collection, because its important for the families of the victims of crimes.
- ▶ As technology continues to advance, our abilities to clear crash scenes faster and more accurately will increase.

Post Crash Investigation

Post Crash Investigation

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- ▶ Reporting
 - ▶ Texas CR-3
 - ▶ Now Texas CR-4
 - ▶ Then each agency will vary on process of using their report systems.
 - ▶ Scale diagram or drawing.

TEXAS POLICE OFFICER'S CRASH REPORT (FORM CR-3)

Law Enforcement and TxDOT Use ONLY: ☐ FATAL ☐ CMV ☐ SCHOOL BUS ☐ RAILROAD ☐ MAB ☐ SUPPLEMENT ☐ ACTIVE ☐ SCHOOL ZONE

Total Num. Units: _____ Total Num. Prns.: _____ TxDOT Crash ID: _____

Texas Peace Officer's Crash Report (Form CR-3 1/1/2010)
 Mail to: Texas Department of Transportation, Crash Records, P.O. Box 148549, Austin, TX 78714. Questions? Call (512) 486-5780
 Refer to Attached Code Sheet for Numbered Fields

Page: _____ of _____

Crash Date (MM/DD/YYYY): _____ *Crash Time (24HRMM): _____ Case ID: _____ Local Use: _____

County Name: _____ City Name: _____ Outside City Limit: ☐

In your opinion, did this crash result in at least \$1,000 damage to any one person's property? ☐ Yes ☐ No

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

ROAD ON WHICH CRASH OCCURRED

2 Rdv. Part: _____ Block Num.: _____ 3 Street Prefix: _____ *Street Name: _____ 4 Street Suffix: _____

5 Unit Desc.: _____ 6 Veh. Color: _____ 7 Body Style: _____

8 DL/DLID: _____ 9 DL Class: _____ 10 CDL End: _____ 11 DL Rest: _____ DOB (MM/DD/YYYY): _____

Name: Last, First, Middle
 Enter Driver or Primary Person for this Unit on first line

14 Injury Severity: _____ 15 Age: _____ 16 Sex: _____ 17 Eject: _____ 18 Rest: _____ 19 Head: _____ 20 Helmet: _____ 21 Sol: _____ 22 Acc: _____

Not Applicable - Alcohol and Drug Results are only reported for Driver/Primary Person for each Unit.

Owner: _____ Owner/Lessee Name & Address: _____

Proof of _____ Yes ☐ Expired ☐ 26 Fin. Resp. Name: _____ Fin. Resp. Num.: _____

Fin. Resp. Phone Num.: _____ 27 Vehicle Damage Rating 1: _____ 27 Vehicle Damage Rating 2: _____ Vehicle Inventoried: ☐ Yes ☐ No

Towed By: _____ Towed To: _____

Unit Num.: _____ 5 Unit Desc.: _____ 6 Veh. Color: _____ 7 Body Style: _____

8 DL/DLID: _____ 9 DL Class: _____ 10 CDL End: _____ 11 DL Rest: _____ DOB (MM/DD/YYYY): _____

Address (Street, City, State, ZIP): _____

Name: Last, First, Middle
 Enter Driver or Primary Person for this Unit on first line

14 Injury Severity: _____ 15 Age: _____ 16 Sex: _____ 17 Eject: _____ 18 Rest: _____ 19 Head: _____ 20 Helmet: _____ 21 Sol: _____ 22 Acc: _____

23 Drug Result: _____ 24 Drug Result: _____ 25 Drug Result: _____

Owner: _____ Owner/Lessee Name & Address: _____

Proof of _____ Yes ☐ Expired ☐ 26 Fin. Resp. Name: _____ Fin. Resp. Num.: _____

Fin. Resp. Phone Num.: _____ 27 Vehicle Damage Rating 1: _____ 27 Vehicle Damage Rating 2: _____ Vehicle Inventoried: ☐ Yes ☐ No

Towed By: _____ Towed To: _____

This page includes an overview of the accident: date, time, location, and type of road where it occurred.

In this report, a "Unit" is a single vehicle or other road user - a pedestrian, cyclist, etc. The unit number given here designates the same vehicle or road user throughout the report.

The vehicle type, identifying information such as the year, make, and model, and the owner's name and contact information are listed here.

Codes indicate whether the drivers or passengers in each vehicle were injured, ejected, or had to be extracted from the vehicle. This section also describes whether safety equipment (like seatbelts) was used and whether the driver was under the influence of drugs or alcohol.

PAGE 1

TEXAS PEACE OFFICER'S CRASH REPORT (FORM CR-3)

PAGE 2

Law Enforcement and TxDOT Use ONLY: Form CR-3 1/1/2010

Case ID: _____ TxDOT Crash ID: _____

Unit Num.: _____ Prn. Num.: _____ Taken To: _____ Taken By: _____ Date of Death (MM/DD/YYYY): _____

DISPOSITION OF INJURED FILED

Unit Num.: _____ Prn. Num.: _____ Charge: _____

CHARGES

Unit Num.: _____ Prn. Num.: _____ Charge: _____

Owner's Name: _____ Owner's Address: _____

LBS. ☐ TRANSPORTING ☐ 9+ CAPACITY ☐ 28 Veh. Oper. ☐ 29 Carrier ID Type ☐ Carrier ID Num.: _____

Carrier's Primary Addr: _____

32 HazMat Class Num.: _____ 32 HazMat ID Num.: _____ 32 HazMat Class Num.: _____ 32 HazMat ID Num.: _____

34 Trlr. Type: _____ 34 Trlr. Type: _____ 34 Trlr. Type: _____ 34 Trlr. Type: _____

35 Seq. 2: _____ 35 Seq. 3: _____ 35 Seq. 4: _____ Total Num. Axles: _____ Total Num. Tires: _____

37 Vehicle Defects (Investigator's Opinion): _____ 38 Weather Cond.: _____ 39 Light Cond.: _____ 40 Entering Roads: _____ 41 Roadway Alignment: _____ 42 Roadway Condition: _____ 43 Surface Condition: _____ 44 Traffic Control: _____

Investigator's Narrative Opinion of What Happened (Attach Additional Sheets If Necessary): _____

Field Diagram - Not to Scale

Indicate North: _____

Time Notified (24HRMM): _____ How Notified: _____ Time Arrived (24HRMM): _____ Report Date (MM/DD/YYYY): _____

Invest. Comp. ☐ Yes ☐ No Investigator Name (Printed): _____ ID Num.: _____

DRI: _____ Agency: _____ District Area: _____

The top of this page lists the names of anyone who was killed in the accident. The investigating officer will also state the exact date and time of death, as well as where the person was taken to after the fatal crash.

The middle part of this page states if there were any charges filed against either driver involved in the crash. There's also a section where the investigating officer can list any damage caused by the accident to anything other than the vehicles involved in the crash. Information about any commercial motor vehicles (CMV) involved in the crash - including the CMV carrier's name and address - can be found here.

The bottom part of the page contains two of the most important parts of the accident report - the investigating officer's diagram and description of the accident. The description is the "investigator's narrative opinion of what happened." The "field diagram" is a drawing showing the exact location of the vehicles involved in the crash at the time of impact. If you disagree with the investigator's narrative or field diagram, make sure you tell the investigating officer what happened so the accident report accurately reflects exactly what happened.

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Post Crash Investigation

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- ▶ What are we doing with all the data and evidence we collected?
- ▶ MATH!! LOTS OF MATH!!

Post Crash Investigation

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TO FIND	WHEN GIVEN	EQUATION TO USE
ACCELERATION a ft / s ² or m / s ²	$t \quad v_i \quad v_e$	1. $a = \frac{v_e - v_i}{t}$
	$t \quad v_i \quad d$	2. $a = \frac{2d - 2v_i t}{t^2}$
	$v_i \quad v_e \quad d$	3. $a = \frac{v_e^2 - v_i^2}{2d}$
INITIAL VELOCITY v_i ft / s or m / s	$t \quad a \quad v_e$	4. $v_i = v_e - at$
	$t \quad a \quad d$	5. $v_i = \frac{d}{t} - \frac{at}{2}$
	$a \quad v_e \quad d$	6. $v_i = \sqrt{v_e^2 - 2ad}$
END VELOCITY v_e ft / s or m / s	$t \quad a \quad v_i$	7. $v_e = v_i + at$
	$a \quad v_i \quad d$	8. $v_e = \sqrt{v_i^2 + 2ad}$
DISTANCE d ft or m	$t \quad a \quad v_i$	9. $d = v_i t + \frac{1}{2} at^2$
	$a \quad v_i \quad v_e$	10. $d = \frac{v_e^2 - v_i^2}{2a}$
	$t \quad v_i \quad v_e$	11. $d = \frac{t(v_i + v_e)}{2}$
TIME t s	$a \quad v_i \quad v_e$	12. $t = \frac{v_e - v_i}{a}$

Note: $a = fg$ where $g = 32.2 \text{ ft/s}^2$ in USA units and $g = 9.81 \text{ m/s}^2$ in SI units

Exhibit 1. Basic motion equations – use of only these 12 equations reduces the confusion that beginning students often have. These equations are identical for both USA and SI units. The symbols and units are given in the left column, “To Find.” The unit abbreviations for both USA and SI units are given.

ACCIDENT RECONSTRUCTION CALCULATOR 3

SPEED CALCULATIONS

Minimum Speed

Slide To Stop
 $S = \sqrt{30D(fn \pm e)}$

Speed Combined Multi

Surface / Braking
 $S_c = \sqrt{S1^2 + S2^2 + S3^2 + S4^2}$

Critical Speed Curve

Yaw +10% Grade
 $R = \frac{C^2}{8m} + \frac{m}{2} \quad S = 3.86 \sqrt{\frac{R(f+e)}{1-u(e)}}$

Critical Speed Curve

Yaw -10% Grade
 $R = \frac{C^2}{8m} + \frac{m}{2} \quad S = 3.86 \sqrt{R(f)}$

Speed / Velocity

Constant / Average
 $V = \frac{D}{t}$

Speed / Velocity

Conversion
 $V = 1.466 \times S \quad S = \frac{V}{1.466}$

Closing Speed 2

Vehicles W/ Angle
 $S = \sqrt{(S1^2 + S2^2) - (2 \times S1 \times S2 \times \cos \theta)}$

Final Speed W/

Original Speed
 $S_f = \sqrt{S_o^2 \pm (30Df)}$

Speed To Hydroplane

Non-Flooded Surface
 $S = 21.19 \times psi^{0.3} \sqrt{\left(\frac{W}{L}\right)^{-1}}$

Speed To Hydroplane

Flooded Surface
 $S = 10.35 \sqrt{PSI}$

Version 3.0.1071 Beta Dev Mike <https://dev-mike.com> Report Bug

Post Crash Investigation

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FRICTION

Two Types of Friction

Static

No relative motion between
tires and surface.

Control is retained.

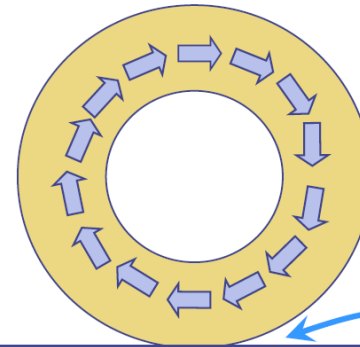
Dynamic

Relative motion exists
between tires and surface.

Vehicle is sliding.

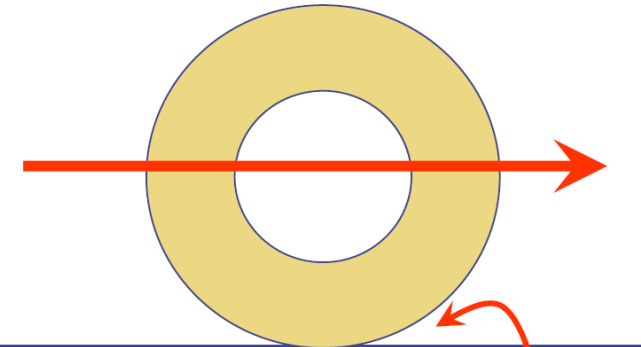
Control is lost.

Static Friction



As the tire rolls across
the surface, there is no
relative motion between
the tire surface and the
roadway.

Dynamic Friction



As the tire slides (skids)
across the surface, relative
motion exists between the tire
and the roadway.

Post Crash Investigation

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Grade and Super-elevation

ELEVATION

GRADE (m)

Grade (m) is elevation that is in-line with the directions of travel on a roadway.



SUPER-ELEVATION (e)

Super-elevation is elevation that goes across the roadway from side to side for either (1) drainage or (2) banking in a curve.



Post Crash Investigation

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Coefficient of Friction ← Identified with the Greek symbol Mu (μ)

$$\mu = \frac{\text{Force Horizontal}}{\text{Weight}}$$

Are they the same?

Mu is always indicative of a level surface...it deals purely with FRICTION!

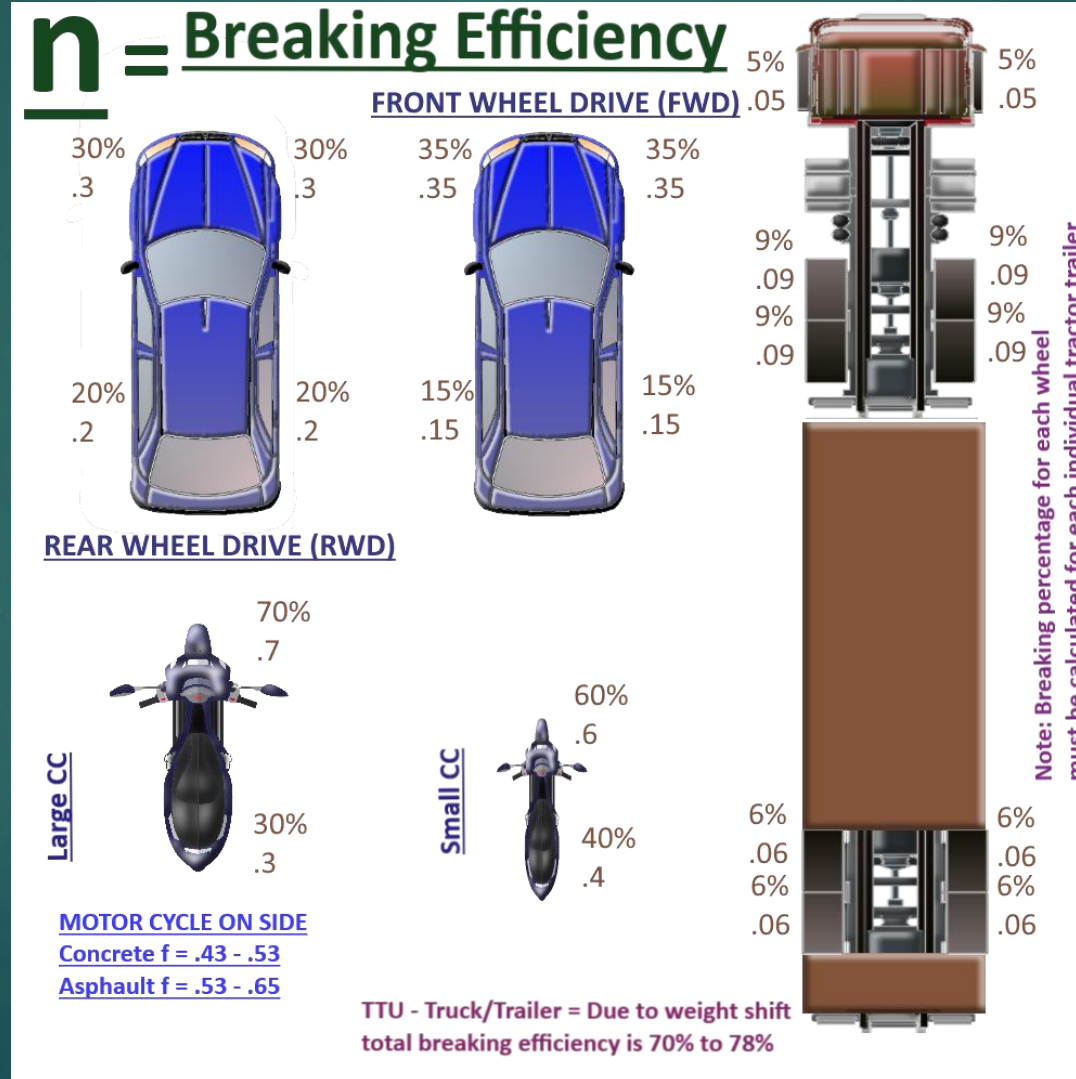
Drag Factor ← Identified with the lower case letter “f”

$$f = \frac{\text{Force Parallel to Surface}}{\text{Weight}}$$

“f” deals not only with friction, but also deals with additional gravitational forces present due to grade and/or super-elevation.

Post Crash Investigation

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Post Crash Investigation

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- ▶ Airbag Control Module downloads.



Post Crash Investigation

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- ▶ Completing search warrants and subpoenas
 - ▶ Medical records
 - ▶ Phone records
 - ▶ Social Media
 - ▶ Cellphone download
 - ▶ Security camera footage

Post Crash Investigation

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- ▶ Conducting post crash vehicle inspections
 - ▶ Looking for mechanical issues
 - ▶ Weighing vehicles
 - ▶ Documenting seatbelts
 - ▶ Light switch position
 - ▶ Seat track position
 - ▶ Tire condition

Post Crash Investigation

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- ▶ Considering criminal charges?
 - ▶ Meeting with the district attorney.
 - ▶ Going over the findings of the case.
 - ▶ Presenting to Grand Jury.
 - ▶ Testifying in hearings or court.

Post Crash Investigation

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Charges generally filed by Traffic Crash Investigator:

- ▶ Intoxication Manslaughter
- ▶ Manslaughter
- ▶ Criminally Negligent Homicide
- ▶ Murder

Post Crash Investigation

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- ▶ Information and evidence collected at a crash scene may not even result in a criminal case being filed.
- ▶ Civil cases and depositions usually follow.

Post Crash Investigation

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- ▶ A post crash investigation can run for a month to three months after a crash or longer.
- ▶ Sometimes you don't know how long a case will take to work.
- ▶ No two cases are ever the same.
- ▶ A lot of similarities are there though.

Closing

Closing

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- ▶ We do this to better improve public safety.
- ▶ We try to collect accurate data to provide for better road or vehicle design.
- ▶ Even though we rarely work with each other, our jobs coincide more than you would ever think.
- ▶ It is important to form good relationships with each other.
- ▶ Together we can provide for safer roadways for our families, friends, and communities.

Thank you!!