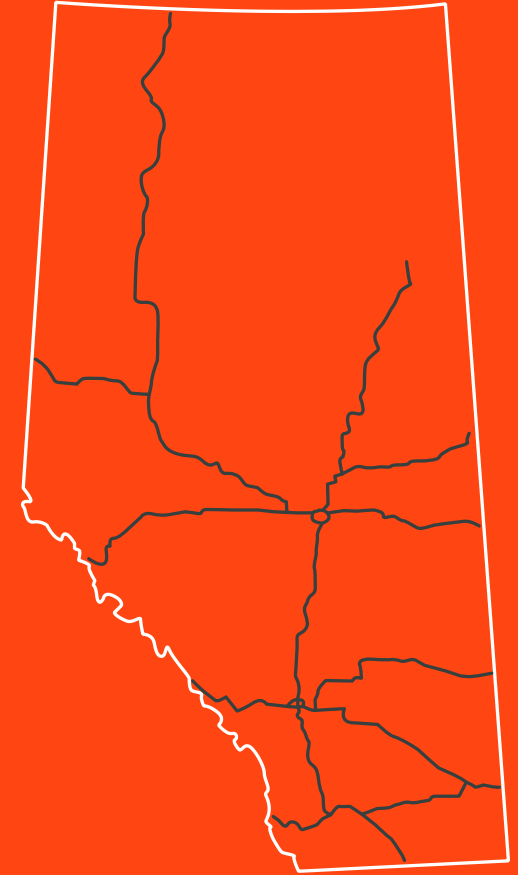


Fatigue



Fatigue Management

It is estimated that about 20% of fatal collisions involve driver fatigue, calculated by eliminating other possible causes such as alcohol impairment, speeding, unsafe passing, etc. (CCMTA, 2010)

A 2007 survey found that about 60% of Canadian drivers admitted that they occasionally drove while fatigued and 15% of respondents admitted that they had fallen asleep while driving during the past year. (Vanlaar et al., 2008)

Fatigue Management – What is Fatigue?

Fatigue is the state of feeling very tired, weary or sleepy resulting from insufficient sleep, prolonged mental or physical work, or extended periods of stress or anxiety.

Boring or repetitive tasks can intensify feelings of fatigue.

Fatigue can be described as either acute or chronic.



**DRIVING TIRED
IS DRIVING IMPAIRED.**

Fatigue Management – What Is Fatigue?

Though the transport industry has hours of service regulations in place, fatigue is not simply adhering to these rules.

Fatigue can strike at any time, even if a driver is well within these regulations.



Fatigue Management – Acute Fatigue

Acute fatigue results from short-term sleep loss or from short periods of heavy physical or mental work. The effects of **acute fatigue** are of short duration and usually can be reversed by sleep and relaxation.



Source: Lee Valley Tools

Fatigue Management – Chronic Fatigue

Chronic fatigue syndrome is the constant, severe state of tiredness that is not relieved by rest. The symptoms of chronic fatigue syndrome are similar to the flu, last longer than six months and interfere with certain activities. The exact cause of this syndrome is still unknown.

If you are experiencing the symptoms of chronic fatigue, seek medical advice. You may need a variety of medical tests to rule out health problems that may have similar symptoms.



Fatigue Management – Physical Fatigue

Physical fatigue is the inability of a muscle to maintain optimal physical performance and is made more severe by intense physical exercise (or work).

This can result in a decrease in physical performance and may have mental components.



Fatigue Management – Mental Fatigue

Mental fatigue is a temporary inability to maintain optimal mental performance. The onset is gradual and depends upon an individual's cognitive ability, and also upon other factors, such as sleep deprivation and overall health.

Mental fatigue has also been shown to decrease physical performance.



Fatigue Management – General Fatigue

General fatigue is a feeling of tiredness after extended or repeated performance, particularly of tasks that are not mainly physical.

Feeling of monotony or boredom created by lack of stimulation.



Map: Google Maps

Fatigue Management – Causes of Fatigue

Fatigue can be caused by:

- Stress
- Sleep loss/debt
- Job requirements
- Prolonged exposure to chemical or physical hazards
- Displaced biological rhythms

Fatigue Management – Stress

Stress is the body's response to a real or perceived threat. That response is meant to get people ready for some kind of action to get them out of danger.

Most of the threats people face today aren't something that they can fight or run away from.

It can be very hard to concentrate, make decisions, and feel confident when a person experiences a lot of stress.

All forms of stress will contribute to fatigue.



Source: unknown

Fatigue Management – Sleep Loss/Debt

The average adult needs 7.5 to 8.5 hours of sleep per night.

Eight 1-hour naps \neq full eight hours of sleep.

Missed sleep or sleep loss results in cumulative “sleep debt” from the sleep account.

Sleep debt requires “recovery sleep,” which is not a one-for-one replacement for missed sleep.

Effects on health are cumulative and compound over time.



Fatigue Management – Sleep Loss/Debt

Fatigue equivalence to alcohol impairment

A driver who has been awake for 17 hours has a driving ability similar to that of a driver with a blood alcohol concentration (BAC) of 0.05, and after 24-25 hours, similar to a BAC of 0.10.

The legal limit of blood alcohol concentration of 0.08.



Fatigue Management – Job Requirements

Fatigue can result from:

- Performing complex tasks
- Repetition of tasks/monotony or boredom
- Elevated physical labour
- Use of heavy or bulky PPE (personal protective equipment)
- Walking over rough, uneven terrain, or dealing with soft surfaces such as mud or snow

Fatigue Management - Exposure

Prolonged exposure to chemical or physical hazards can cause fatigue over time.

- Noise, vibration, chemicals, radiation, harmful UV rays, extreme temperatures



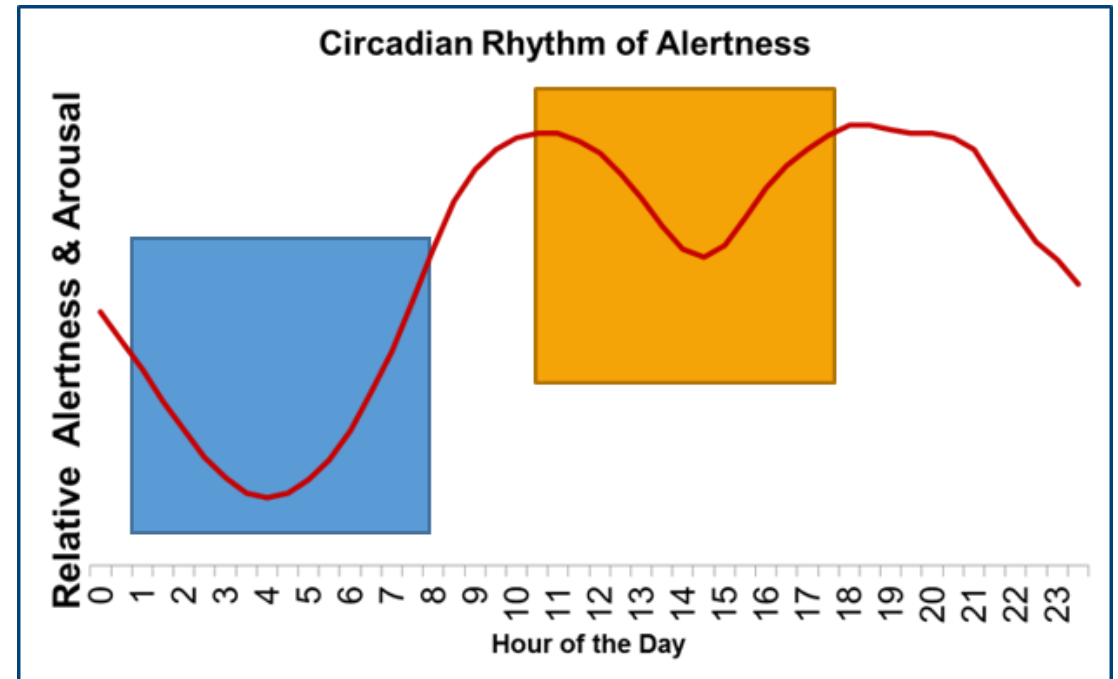
Fatigue Management – Circadian Rhythm

Humans are daytime creatures. During the day, sunlight suppresses melatonin levels, regulating wakefulness.

When the sun sets, our melatonin levels rise, encouraging sleep.

Even during the day, we experience peaks and valleys of sleepiness.

Low levels: midnight to 6:00 a.m. and 2:00 p.m. until 4:00 p.m.



Fatigue Management – Truck Drivers

Fatigue and commercial vehicle drivers

- Commercial drivers often work long shifts, over several days
- Often drive for prolonged periods at night, when their circadian rhythm is at its lowest
- Can work irregular hours, sometimes with little or poor-quality sleep, and frequently have early starting times

Many commercial vehicle drivers work more than 12 hours per day and 70 hours per week, which makes them particularly susceptible to fatigue.

It is up to the company and the driver to ensure adequate time off is provided.

It is up to the driver to ensure that they make the best use of their off-duty time in order to get rest.

Fatigue Management – Effects of Fatigue

What does fatigue do to your driving ability?

- Reduced decision-making ability
- Reduced ability to do complex planning
- Reduced attention and vigilance, loss of memory or the ability to recall details
- Slower reaction time - perception and physical
- Failure to respond to changes in surroundings or information provided
- Unable to stay awake (e.g. falling asleep while operating machinery or driving a vehicle)
- Increased tendency for risk-taking, forgetfulness, errors in judgement
- Increased accident rates

Fatigue Management – Warning Signs

How do you know you're falling asleep while driving?

Tiredness or sleepiness, including micro sleeps.

- A 4 second micro sleep at 110 km/h = 122 meters travelled
- Head nodding is often associated with micro sleep

Inability to recall the last few seconds or even minutes, missing signs or other vehicles coming “out of nowhere”.

Tired or sore eyes.

Drowsiness, restlessness, or boredom.

Fatigue Management – Warning Signs

How do you know you're falling asleep while driving?

- Yawning
- Poor motor skills, drifting in the lane, erratic use of the accelerator or brake
- Making fewer and larger steering corrections
- Slow reactions
- Poor concentration
- Feeling irritable

Fatigue Management – Rest Versus Sleep

Rest and sleep are not the same things.

Rest can provide a break and may help increase energy levels.

Sleep is restorative and required for good health.

During sleep, the human body:

- Increases production of proteins, which help cells grow and repairs damage caused by stress or ultraviolet exposure
- Helps maintain our immune and endocrine systems, which helps combat obesity, hypertension, and diabetes

Source: National Sleep Foundation, Sleep-wake Cycle: Its Physiology and Effect on Health

Fatigue Management - Diet

In general, a good mix of complex carbohydrates, fiber, and protein can be beneficial in combating fatigue.

- Lean meats (skinless chicken, certain cuts of steak, fish)
- Whole grain bagel with cheese
- Whole grain bread with peanut butter
- Eggs with whole grain toast and fruit
- Oatmeal
- Fruits and vegetables

Fatigue Management – Prevention

Make sure you are well-rested before long trips:

Eat a light meal before driving, not a heavy one.

Plan for breaks every two hours to move.

- Stop to eat snacks or light meals rather than driving and eating.

If possible, avoid driving at night or at times you would normally sleep.

When are the two dips in our circadian rhythm?

- Midnight to 6 a.m. and 2:00 p.m. to 4:00 p.m.

Fatigue Management – Prevention

Slow down:

- Driving at higher speeds forces you to process a large amount of information quickly, which can bring on fatigue
- Move your eyes every two seconds to avoid visual fatigue
- Avoid driving alone whenever possible
- Keep driver's area cool and well ventilated

Fatigue Management – Prevention

Maintain alertness:

- Avoid soft music, change radio station often
- Talk to passengers without being distracted
- Watch for road and traffic signs
- When taking a break, get out of the vehicle and walk, jog or stretch

Fatigue Management – Strategies

Some good sleep strategies include:

Control noise, temperature, and lighting. Sleep in a cool, dark room. A low background noise, such as from a fan or radio, may help.

Use a good mattress and find a comfortable posture.

If you are unable to fall asleep in 20-30 minutes, you may be on an upward cycle in your circadian rhythm.

- Get up and do something different until you start to feel tired again. Avoid frustration at being unable to fall asleep.

Fatigue Management – Strategies

Some good sleep strategies include:

- Increase exposure to sunlight during waking hours to lower your melatonin levels
- Develop a pre-sleep routine so the brain anticipates sleep
- Establish consistent bed and wake times
- Increase body heat before bedtime (short walk, hot shower or bath)
- Minimize disruptive factors
- Control light, noise and temperature (16° C – 20° C)

Fatigue Management – Strategies

Poor strategies – chemical stimulants

Some stimulants may extend performance, but not always productively.

Stimulants cause a wide range of responses in physiology and performance.

- There is often a rebound fatigue effect.
- All stimulants can cause damage with repeated use and abuse.

Smoking is often used to combat fatigue. However, it often leads to a disrupted circadian rhythm, sleep apnea, restless sleep, and insomnia.

Fatigue Management – Strategies

Poor strategies – caffeine

The most widely used psychoactive drug in the world.

- Found in coffee, some tea, chocolate, some soft drinks, and in some medications.

Caffeine can increase alertness, but only momentarily.

The body becomes adapted to caffeine; after repeated or excessive use, increased doses are required for the same effect.

Fatigue Management – Strategies

Sleep disorders

Insomnia is the inability to fall asleep or remain asleep as long as desired.

Sleep apnea is a sleep disorder that causes pauses in breathing or slows the breathing rate.

Over 1 in 4 (26%) Canadian adults reported symptoms and risk factors that are associated with a **high risk of having or developing obstructive sleep apnea.**

Since proper sleep may not be attained, these sleep disorders may impair a driver's ability to drive when left untreated.

See a doctor if you often feel tired during the day or have trouble sleeping at night.

Fatigue Management – Strategies

Exercise

A study that looked at the effects of a single exercise session found that a bout of moderate-intensity aerobic exercise (e.g. walking for 15 minutes) reduced the time it took to fall asleep and increased the length of sleep of people with chronic insomnia compared to a night in which they did not exercise.

Fatigue Management – Strategies

If you feel fatigued while driving

At the first sign of fatigue, stop at a safe place to take a break and stretch your muscles or take a nap for 15 to 20 minutes.

- Exceeding 20 minutes can put you into a deeper level of sleep. You may actually feel groggier upon waking.

If you're going to nap, do it in a safe spot: rest area, parking lot, or other area that allows your vehicle to be safely parked. Never nap on the shoulder of a highway.

When you wake up, make sure that you're not experiencing "sleep inertia". Get out and walk around your vehicle to help stimulate blood flow and increase oxygen levels.

Fatigue Management - Summary

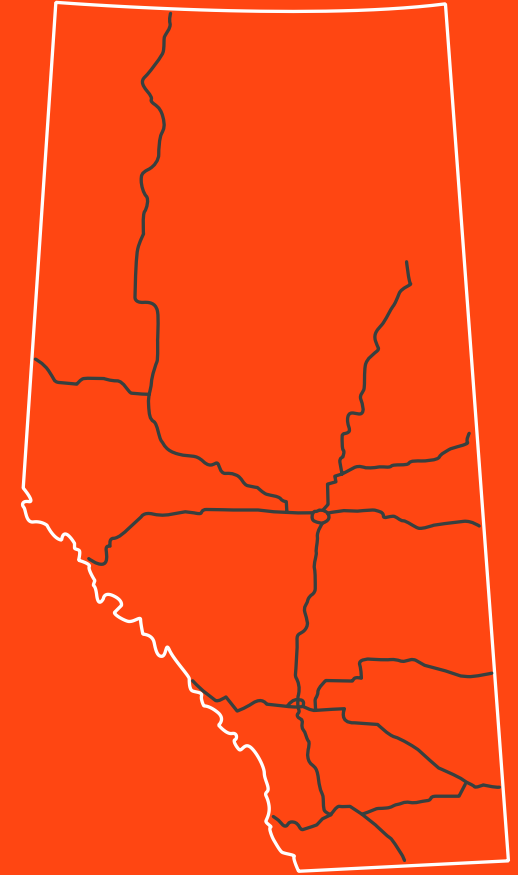
Sleepiness is a serious threat to driving safety.

Fatigue is physiological, and can be affected by psychological factors.

People differ in their susceptibility to fatigue.

You can manage your fatigue with good sleep strategies and healthy nutrition.

Distracted Driving



What is distracted driving?

Any act that takes a driver's:

- hands
- eyes
- mind

away from the task of driving.



Image source: Global News

What does Alberta law say?

Alberta's distracted driving law applies to all vehicles as defined by the Traffic Safety Act and all roads in Alberta.

It restricts drivers from doing any of the following, even while stopped at red lights (and drive-thrus).

- using hand-held cell phones
- texting or e-mailing

What does Alberta law say?

- using electronic devices such as laptop computers, video games, cameras, video entertainment displays and programming portable audio players such as MP3 players
- entering information on GPS units
- reading printed materials in the vehicle
- writing, printing or sketching
- personal grooming such as brushing and flossing teeth, putting on makeup, curling hair, clipping nails or shaving

What can I do under the rules?

You may still:

- eat
- take a drink of your (non-alcoholic) beverage
- smoke
- talk to passengers
- listen to music
- call 911 with your hand-held cell phone
- use a two-way radio (provided it's required to keep in contact with your employer)
- use your GPS

What about Bluetooth?

Using a phone (or other device) in a hands-free mode is allowed.

However...is it the act of holding the phone against your head that is the distraction or is it the conversation?

It's also important to remember that holding your phone in your hand and using the speakerphone is still illegal.

But I can multitask!

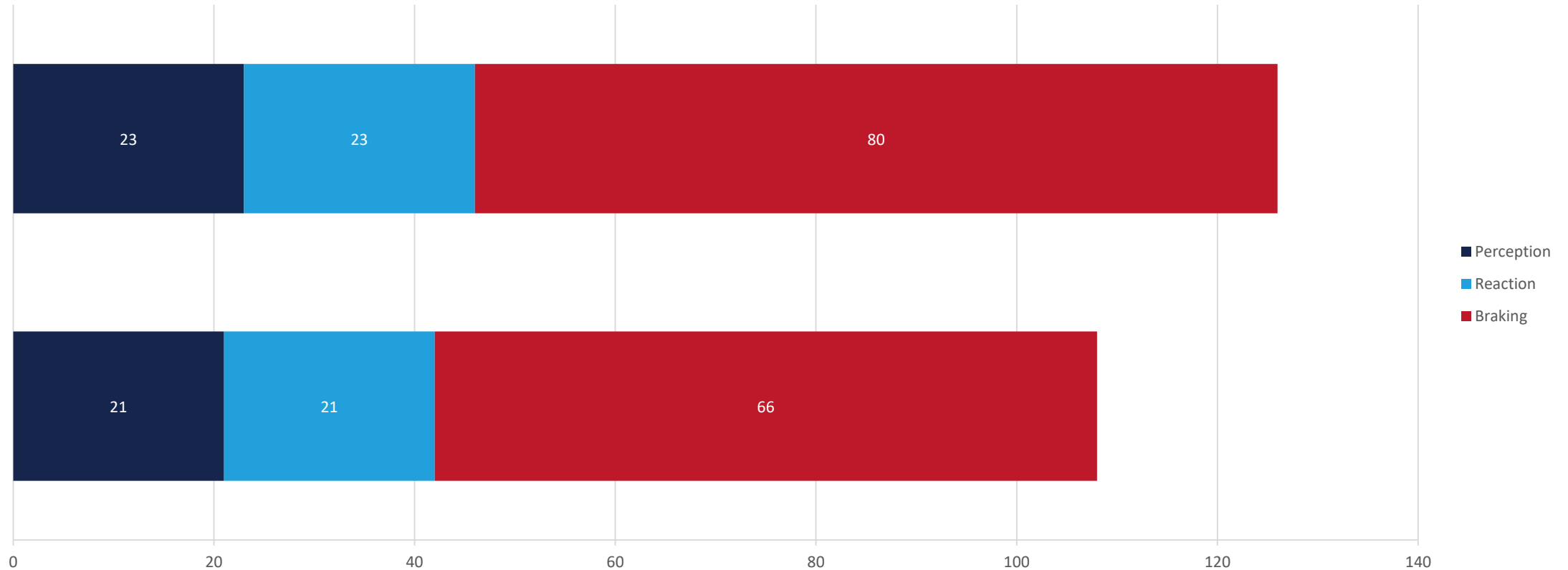
No. You can't.

It is impossible for the human brain to perform two cognitive tasks at the same time.

We can task switch, but each task switch costs roughly 1/10 of a second, not including the time it takes to perform the task itself.

How far do you go?

BRAKING DISTANCE VERSUS SPEED



What are the penalties?

- \$287 fine (plus tax and surcharges)
- 3 demerit points

**What is
the cost of
distracted
driving?**



Eight Seconds: One Fatal Distraction

Minnesota Department of Safety:

<https://youtu.be/MUSo89BLRcI>



Eight Seconds: One Fatal Distraction

February 27, 2018 – Stillwater, Minnesota

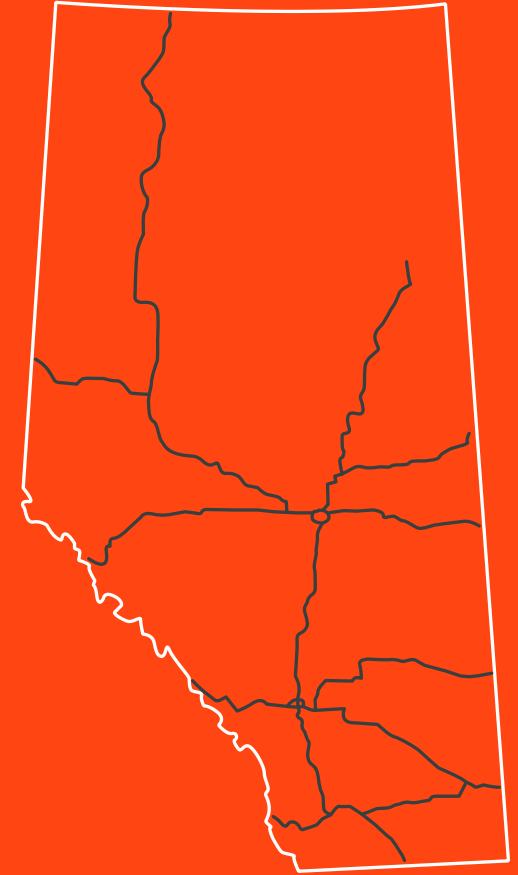
- 54-year-old Robert Bursik was stopped at a light on Highway 36
- Sam Hicks, traveling ~100 km/h, checked a text message from his girlfriend
- In 8 seconds, he traveled roughly 225 meters
- In 8 seconds, he irrevocably altered dozens of lives



Distracted Driving

- In summary:
 - You cannot multitask
 - You can be distracted mentally, physically, and visually
 - ANY distraction costs you time and space
 - The costs of distracted driving can be extreme

New Rules for Impaired Driving



Provincial Penalties Act

- As of December 1st, changes were made to the way roadside suspensions are dealt with



Provincial Penalties Act

- Online Administrative Penalty Information System:
 - View penalty details
 - Pay fines
 - Request more time
 - Request a vehicle seizure review
 - Request a review by SafeRoads Alberta
- Brief look at first occurrence penalties

Immediate Roadside Suspension Program

- IRS WARN Program: non-GDL drivers between .05 and .07
 - 3-day license suspension
 - 3-day vehicle seizure
 - \$300 fine plus victim fine surcharge of 20%



Immediate Roadside Suspension Program

- IRS FAIL Program applies to drivers with criminal impairment
 - Drivers exceeding .08 BAC and/or a BDC exceeding legal limits
 - 90-day license suspension (plus 12 months with ignition interlock)
 - 30-day vehicle seizure
 - “Planning Ahead” course
 - \$1,000 fine plus victim fine surcharge of 20%

Immediate Roadside Suspension Program

- IRS ZERO Program applies to drivers in the GDL system
 - Zero blood alcohol concentration or blood drug concentration when driving
 - 30-day license suspension
 - 7-day vehicle seizure
 - \$200 fine plus victim fine surcharge of 20%

Immediate Roadside Suspension Program

- IRS ZERO: Commercial Program applies to drivers operating a commercial vehicle (11,794 kg or seating 11 or more passengers)
 - Zero blood alcohol concentration or blood drug concentration when driving
 - 3-day license suspension
 - \$300 fine plus victim fine surcharge of 20%
 - If an IRS WARN or FAIL is issued, the vehicle will be seized (cargo, if applicable, will be released to the carrier)

