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How and Why Wrong Way Accidents Occur

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Some of the most catastrophic accidents occur when a driver headed down the highway suddenly spots a truck or car traveling directly toward them in the wrong direction that that could cause a horrific head-on collision. Usually, these accidents are avoided because of median barriers that stop errant driving and roadway signage that clearly identifies the direction of traffic to prevent drivers from entering the road the wrong way.

However, according to statistics released by the U.S. Federal Highway Administration, more than 350 individuals lose their lives every year in wrong way driving crashes even on roads where the direction of the traffic is clearly marked. Even though wrong way crashes are an uncommon occurrence, affecting just a small percentage of all accidents involving motor vehicles, these types of collisions lead the pack again all motor vehicle crashes resulting in fatalities. These types of pressures have a high fatality rate range between 12% and 27%, which is disproportionately higher than other types of vehicle-related crashes and collision.

Wrong way collisions typically involve a head-on impact at a high rate of speed that often results in a horrific injury or fatality involving both drivers and passengers. Any vehicle occupant who survives the accident usually sustains an extremely severe injury that causes long-term residual problems in the future. Most survivors require constant rehabilitation and ongoing surgeries to restore basic functions or repair broken or crossbones bones and other severe injuries to other extremities. This includes head trauma, brain injuries, whiplash, or injury to the chest, spinal cord, ribs, and/or abdomen. Paralysis is also a common result of wrong way driving crashes.

An Illinois Problem

In recent years, the state of Illinois has developed and implemented a wrong way driving program to identify high-risk locations for these kinds of accidents and address correcting the problem using various strategies and countermeasures. The safe driving program initiated by the state's Department of Transportation was in response to the 217 Wrong Way driving accidents that occurred on Illinois freeways between 2004 and 2009.

Many of these accidents were horrific and resulted in 248 serious bodily injury and 44 fatalities. The state initially conducted a study that identified many of the contributing factors to driving the wrong way on certain locations across the state. They use the information of the study to determine the best

methods for building a solid safety campaign, including installing better signage in strategic areas to help the driver make better decisions and quickly identify how to stay safe on Illinois state routes and roadways.

Better Signage

- Do Not Enter Signs – Signage installed at high-risk areas are the traditional way to handle the problem in the least expensive way to improve driver awareness and deter the motorist from making a maneuver in the wrong direction at an exit ramp or crossroad. This includes placing a “DO NOT ENTER” sign in a spot that is easily recognized by a wrong way driver. Additionally, installing “DO NOT ENTER” signage at the end of one-way frontage roads where they intersect with freeway exit ramps helps motors understand they are entering an exit ramp.

- One-Way Signs – Illinois also decided to install “ONE- WAY” signage posted at intersections with crossroads and exit ramps that are parallel to a one-way ramp. Signs and these locations can increase the driver’s awareness that they are traveling in the wrong direction. Additionally, the placement of “No Left/Right Turn” signage where it is most easily viewed by drivers can help prevent many wrong way movements.

However, these signs must be positioned “face on” at a location that is clearly visible to a motorist who is maneuvering their vehicle in that area. If the signage is positioned in a location that is not highly visible to a confused driver, it can often cause a conflict between the desired action and a message the sign is conveying. The state of Illinois also began installing supplemental or oversize signage to help increase the sign’s visibility.

- Wrong Way Signs – Making signage with flashing borders that blank along the edge of a “WRONG WAY” sign can enhance its conspicuity, especially during nighttime hours. The signs visibility can be heightened immensely if other components of the signage contain reflected material. However, the least confusing Wrong Away signs will have dynamically activated flashing borders, and only begin blinking when an incident involving a wrong way driver is detected by sensors.

- No Turn Signs – Installing a “No Left/Right Turn” sign that is clearly visible to a driver might prevent a wrong way movement. This is especially true if the sign is mounted in a location that helps the driver easily identify they are traveling the wrong way.

- In-Lane Arrows – Painting In-Lane arrows on the pavement more it approaches an intersection or entrance/exit ramp can avoid confusion to drivers. The arrows can prevent a wrong way maneuver that takes the driver in the wrong direction. In-Lane arrows are highly effective in urban environments, especially in downtown areas that usually have numerous one-way streets. Drivers can easily become confused and turn the wrong way down a one-way road after turning off a two-way road without realizing they have endangered themselves and others sharing the street.

- Delineation Signage – Illinois now installs red retro-reflective markers on roadways that are raised above the pavement. These markers increase the visibility of lane separations, arrows and other indicators on the exit ramp. These delineating markers are highly reflective during the nighttime hours when the highest incident rates of wrong weight accidents occur.

Common Causes

While there are numerous causes of wrong way collisions, driver error and mistakes are the leading factors in wrong way accident fatalities and injuries. This is because a motorist can turn onto the highway exit ramp believing it is an entrance ramp due to their confusion or physical/cognitive impairment. Other factors involved in driving the wrong way include:

- Driving distracted – This includes talking or texting on cell phones when operating a motor vehicle or when distracted by using GPS navigational equipment.
- Age of the driver – Drivers who are 70 years and older usually have unique problems including health issues, impaired vision, or medication use which can impair their driving ability.
- Driver Impairment – Approximately 6 out of every 10 “Wrong Way” crashes are caused by the wrong way motorist driving under the influence of drugs or alcohol.
- Lack of signage
- Poorly marked entrance and exit ramps
- Poorly lit signage
- Environmental Factors – Operating a motor vehicle just before sunrise or during the dark of night or under adverse weather conditions including heavy downpours, snowstorms, and dust storms can increase the potential risk of causing a wrong way accident when the driver could not read signage on the roadway.
- Poorly designed exit and entrance ramps
- Inexperienced Driving – Young or newly licensed motorists often lack the experience of making good judgments and focusing on driving that can only develop after years of experience of operating a motor vehicle under all types of conditions.
- Driving under the influence of medications, alcohol, or illegal drugs
- Unfamiliarity with the roadway
- Tired or drowsy drivers
- Fatigue
- Lack of visibility caused by excessive darkness and/or weather conditions
- Suffering from mental health problems while driving

Intoxication from alcohol and illegal drugs is thought to be the cause of driver error that led to a wrong way accident. Most of these accidents tend to happen in the late hours of the weekend between

12:00 AM and 3:00 AM.

According to the National Transportation Safety Board, drivers who are 70 years and older are overrepresented in being at fault for many wrong way accidents. While no definitive studies have concluded the exact reason why the elderly are responsible for many accidents involving driving the wrong way, speculation into the problem might include a difficulty in seeing “DO NOT ENTER” or “WRONG WAY” signage when the vision of the elderly gets worse in later years.

Confusing Ramp Designs

Many entrance and exit ramps on the nation’s freeways are constructed using a partial or complete cloverleaf design. However, these designs tend to confuse many drivers, especially when distracted, impaired or not fully alert. Because of confusion in the entrance and exit design, the motorist might enter the exit ramp and travel the wrong way.

Some studies have shown when motorists are turning left when entering a highway, they have a high risk of entering the exit ramp instead of the entrance ramp as compared to a motorist making a right turn when entering the freeway. It is thought that the motorist turning right arrives at the correct entrance ramp before their vehicle arrives at the wrong ramp.

Most times, especially during daylight hours, motorists will immediately recognize that they have turned onto the wrong ramp and will either back up or maneuver to turn around before they completely enter the freeway. However, in the dark of night, or under poor weather conditions, or because of inebriation the driver can quickly become confused and unaware that they are traveling down the wrong side of the freeway, against approaching traffic.

Avoiding Wrong Way Motorists

There are steps you can take to prevent crashing into a wrong way driver, including looking beyond the cars driving in front and scanning all lanes far ahead. The farther out you can see, the more you Will be prepared to take quick action to avoid the approaching hazard of an oncoming car. Using evasive movements, you can avoid a collision, even if the oncoming driver is traveling at an excessive rate of speed toward you.

Other effective steps can save you and your passengers from becoming victims of a horrific tragic wrong way accident. This includes traveling in the right lane of the road whenever possible. This is because an oncoming wrong way motorist will likely travel in the wrong direction by driving on their right side of the road, which is your fast (left) lane. Other steps for preventing a wrong way accident include:

- **Stay Alert** – Remain focused and alert on the roadway ahead and look for cues from the cars and trucks in front of you will help you identify a problem ahead. This includes flashing brake lights, vehicles quickly decreasing speeds, and the sound of car horns.

- **Move off the Road** – Once you recognize there is a motorist ahead traveling in the wrong direction toward you, you must move your vehicle out of the way as safely and quickly as possible.

- **Always Travel in the Right Lane** – You have a better chance of surviving an incident where another driver was traveling the wrong way if you always drive in the right lane except when

passing others. This is because the fast (left) lane in your direction is the slow (right) lane the wrong way driver typically enters when entering the freeway.

- **Call Law Enforcement** – As soon as you have moved your vehicle off the roadway and you are no longer in danger, it is essential to call emergency services (911) to report the problem. This is because there will likely be others behind you who are unaware of what is happening, meaning a serious or fatal accident might be happening soon.

Of course, monitoring your own driving behavior can go a long way in avoiding wrong-way accidents. Recognize that driving under the influence, distracted driving and impaired vision can easily cause you to make bad decisions and enter the exit ramp by mistake.

Crossing the Median

Some wrong way accidents are the result of another driver crossing the median of a split highway or freeway. These accidents are usually caused by some catastrophic event that occurred with the driver of the other vehicle who might be suffering a heart attack or because they might have been hit by another car or truck on their side of the freeway. It is usually some major event or accident on the other side of the road that caused their vehicle to be thrown into oncoming traffic on your side of the median.

Government Action against Wrong Way Accidents

The highway fatalities caused by wrong way accidents can be prevented when transportation officials and roadway development engineers take appropriate measures. These measures include reconfiguring the design of the ramps/roads or installing new equipment/paint to help alert the driver they are traveling the wrong way. Installing barriers that block confuse drivers from traveling the wrong way can also save lives. Some of these design features include:

- Installing a flashing wrong way sign in areas at high-risk for wrong way accidents
- Paint an arrow or the words “WRONG WAY” on the roadway
- Install additional warning signs on ramps and streets to alert the driver that they are traveling the wrong way
- Install spikes or concrete structures that prevent vehicles from entering the ramp the wrong way
- Install bright lights that help drivers better manage signage in high-risk dark areas
- Install sensor detection equipment and surveillance monitors that can recognize a vehicle traveling the wrong way
- Eliminate cloverleaf patterns that tend to confuse motorists and instead create straight on exit and entrance ramps when modifying an existing roadway or developing a future design of a new road

Sensor equipment can alert law enforcement officers that a driver failed to turn around and is continuing to drive in the wrong direction. In fact, the system can also alert the driver of the dangers ahead by linking signage lights and other easily identifiable warnings.

The installation of “DO NOT ENTER,” “WRONG WAY” and “ONE-WAY” signage at the entrance of freeways can add an additional warning to alert drivers that they are making a mistake that jeopardizes themselves, the occupants in their vehicle, and others sharing the road.

In 2012, the National Transportation Safety Board published the results of a Highly Special Investigation Report on “wrong way” driving. The principal findings of the report concluded that:

- “More than half, possibly as many as three-quarters, wrong way drivers are impaired by alcohol.”
- “Drivers over the age of 70 are overrepresented as at-fall drivers and wrong way collisions compared to other types of controlled-access highway accidents.”
- “The primary origin of wrong way movements… is entering an exit ramp. Other mechanisms resulting in wrong way movement include making a U-turn on the main line or using an emergency turnaround through the median (recovery maneuver after missing an exit).”

New Electronic Wrong Way Technology

The Illinois DOT has been using advanced technologies that detect wrong way driving and sends alerts to government agencies like traffic management centers. The technology can quickly alert the driver using warning devices including LED signage technology. The technology can also be used to verify an incident involving a driver traveling the wrong way by contacting law enforcement to guide them to the location where the incident occurred.

Roadway sensors that are constructed with magnetic sensors and ILDs (inductive loop detectors) are also used. At some locations, embedded magnetic sensors over the pavement can detect vehicles traveling in the wrong direction. These devices work by measuring detectable changes in the earth’s magnetic field as a car or truck traveling in the wrong direction comes near the sensors. The equipment then determines the direction and speed of the vehicle to verify that it is traveling in the wrong direction.

Inductive loop detectors sensors can easily identify a vehicle passing over the system is maneuvering or driving in the wrong direction down a one-way street or ramp. The major benefit of these electronic devices is that they can provide valuable information during all weather conditions throughout the night and day. However, the system is challenging to install and often requires that a lane closure for an extended amount of time while the pavement is cut, removed and reinstalled.

Illinois has also installed “Over the Roadway” sensors that use microwave technology and video image processing to collect data across multiple lanes. The microwave technology can detect a vehicle on the roadway to determine its direction using high-frequency microwave signals that bounced back from the object. Video image processing is effective in detecting the presence of a vehicle and its direction of movement by cameras electronic equipment mounted on a high conspicuous site over the road in an area that provides a wide view. However, videos image processing has a downside in that it is ineffective during inclement weather or when obscured by ice,

snow, salt, rain water, cobwebs and other debris on the camera lens.

Educating the Public

The state of Illinois has implemented education strategies to improve the public awareness of potential risks of driving the wrong way and its potential harm on family members. Previous studies focused on specific education programs that were created for certain age and demographic groups, including drivers found guilty of operating a vehicle while impaired. Since then, other programs have been developed involving comprehensive public safety plans concerning wrong way driving.

The program contains educational material that describes engineering countermeasures used to minimize the potential of wrong way maneuvering. This includes pavement markers, signage, improved and advanced electronic technologies and geometric elements including in road roundabout and reconfiguring highway entrance and exit ramps to increase safety.

Driving the wrong way continues to be problematic for Illinois travelers especially on toll roads and expressways. This is because most drivers who were responsible for causing a wrong way accident were significantly impaired due to drugs or alcohol.

Illinois has taken great measures minimize wrong way accidents on roads that lack sufficient direction using pavement markers and signage. To increase safety, the state has installed barrier delineators, retroreflective LED lights and magnetic sensor systems that can identify a wrong way driver. In recent years, the Illinois DOT installed oversize wrong way signs positioned at each exit ramp throughout the state.

Even with these steps, there are still too many wrong way driving accidents that claim the lives of innocent victims every year. Additionally, the State could take other steps included fixing the road irregularities at high-risk areas susceptible to wrong way driving. The State could also provide better law enforcement that can stop individuals with erratic driving behaviors before they maneuver their vehicles into the wrong lane or drive into an exit ramp and heading toward into oncoming traffic.

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