



# Driving in adverse weather conditions

## Guidance for fleet managers

This best practice guidance report is one of a series produced by Global Fleet Champions to help anyone who employs people who drive for work to manage occupational road risk, regardless of budget, fleet size or vehicle type.

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## Introduction

Weather can be unpredictable and can change quickly. When it does, the risk of a serious collision occurring substantially increases. Wherever possible, drivers should avoid travelling during bad weather conditions but, when a journey is unavoidable, thorough planning, well-maintained vehicles and rigorous policies are essential to reduce crash risk and keep your drivers as safe as possible.

This report contains guidance for fleet managers on ensuring safe journeys during adverse weather conditions. It covers the risks of driving in different weather conditions; how safe driving techniques and good vehicle maintenance can help minimise road danger during bad weather; and technologies to help fleet managers predict bad weather, and plan or re-route journeys to avoid it.

The guidance is based on presentations given at a webinar for fleet managers on driving in adverse weather conditions. The webinar was recorded in the UK, but the content of this guidance will be relevant for fleet managers based anywhere in the world.

## Predicting bad weather

by Mark Hoekzema

### How does weather affect fleet operations?

Poor weather conditions create unsafe conditions for driving. Snow, ice and rain make roads slippery, fog reduces visibility, high winds may blow vehicles off course and extreme heat may affect drivers' awareness and concentration.

Out of all highway incidents recorded in the USA, more than a fifth (21%), or about 1.2 million per year, are weather-related.<sup>1</sup> Almost a quarter (24%) of collisions occur when snow and ice are on the road, and 14% when it is snowing or raining. Wet roads are particularly dangerous, as 70% of road incidents occur when pavements are wet, 46% occur during rainfall, 18% during snow or sleet, 16% on snowy or slushy pavement, 13% on icy pavement and 3% in fog. Although these statistics are specific to the USA, they can be taken as representative for mid-latitude areas around the world that experience a wide range of weathers across all seasons.

### Planning for journeys where adverse weather conditions may be a factor

Weather does not just affect safety on the roads. It may also impact the operational processes of loading or unloading, or increase the need for vehicle checks and maintenance. If fleets fail to properly plan for adverse weather conditions there may be ramifications for their business, such as bottlenecks in operation resulting in lost production and downtime.

Good journey planning requires that fleets have trusted weather prediction and forecasting sources. These should be informed by quality, real-time data, that is frequently updated to ensure it is accurate, and combined with thorough training that sees drivers prepared for different events that could affect their working day. Planning for weather events – and subsequent actions to be taken – should be well-communicated and centrally managed if possible, to guarantee that consistent and clear alerts are passed along to operations.

“ Having well-rehearsed plans for all tasks, locations and distribution points that drivers will interact with, as well as guidance on how to act in different weather scenarios and a central policy, will help improve the safety of your journeys. ”



In terms of finding technology to accurately predict weather conditions ahead of a journey, be wary of free applications that may not have current information, or that provide general data that is not specific to their business concerns. Avoid social media commentary too, as it can lead to further confusion.

Instead, use reliable systems that will alert you on a wide variety of weather parameters, with multiple delivery options for alerts. Ideally this technology should be mobile-friendly so it can be used when and wherever necessary, such as when weather conditions suddenly change during a journey.

Having a plan and a trusted source of information will go a long way towards keeping staff safe and fleet operations running efficiently.

#### AUTHOR

**Mark Hoekzema** is chief meteorologist at Earth Networks

## Preparing for all weather conditions

by Richard Leonard

Driving is dangerous even in perfect weather. In bad weather, the risk increases even further. Before any journey where weather conditions may be a factor, fleet operators should ask whether it is safe to drive.

As managers, you should look at weather conditions and the forecast before any journey commences; you should also have processes that enable drivers to make dynamic risk assessments when weather conditions deteriorate during a journey, and to turn back or stop until conditions improve.

This is important because it is all too easy for an employee to assume that they have to drive regardless of the weather conditions and the possible consequences.

If a journey is deemed necessary, there are steps that can be taken to minimise the danger that it poses to drivers and other road users. Different weather conditions present different challenges, and knowing the risks that different weather conditions can present, will help you instruct your drivers on how best to mitigate the risk.

The exact weather conditions that drivers may encounter will vary depending on where in the world they operate, ranging from sandstorms and extreme heat, through to extreme cold, snow and ice. However, there are basic steps all drivers can take to reduce the risk they face from adverse weather in general.

Most road crashes are caused by human error. This means the first place that fleet managers should look to reduce the risk of bad-weather journeys is addressing dangerous driving behaviours. This could involve reinforcing common-sense advice to drivers to prepare them for driving in adverse weather conditions, including:

- slow down, and maintain a safe gap behind the vehicle in front
- be extra vigilant for people and hazards
- always stay in control, looking ahead and eliminating unnecessary manoeuvres.

When specific weather threats emerge, tailor your recommendations according to the conditions.

## Fog

Fog can occur suddenly even in fair weather patterns, and is particularly common in coastal environments or early in the morning. Drivers caught in fog can quickly find themselves with limited visibility, putting them and other road users in danger. Dust, smoke and blowing snow can also create similar situations.

Some of the worst road crashes are caused by dense fog and high speeds, so you need to remind drivers to be aware of alerts for dense fog and drive accordingly. It is important that drivers check that their vehicle's lights, lenses and reflectors are clean, positioned correctly and working properly. Dipped headlights should be used to improve visibility, and fog lights should be used when conditions are particularly severe. However, drivers must be careful not to dazzle other road users with their fog lights, and should make sure to turn their lights off when visibility improves.

## High winds

High winds can blow vehicles off course or blow other vehicles into their paths. They can also potentially cause disruption like bringing down tree branches. If drivers are not properly prepared, winds can quickly catch them off guard.

If possible, drivers should avoid exposed sections of road when high winds are present, such as high bridges or viaducts. They should reduce their speed and leave extra room when passing other road users. Large trucks are particularly vulnerable to strong crosswinds due to their large, flat sides, especially when hauling double-deck trailers. Curtain-sided vehicles should be opened when empty.

## Rain

Severe storms can become dangerous very quickly. Any storm can create very heavy rainfall with low visibility, and may lead to road flooding.

In heavy rain, it is advisable to maintain at least a four-second gap between vehicles to allow sufficient braking time. Traction will be reduced so it is important to brake, accelerate and steer carefully. If visibility is reduced, drivers should turn on their headlights.

## Snow and ice

Winter storms can lead to a variety of weather conditions, including snow and ice, and road conditions can change very quickly over short distances.

When driving in snow or ice, drivers should reduce their speed and allow greater stopping distance than normal. They should always use dipped headlights, and note that road markings or signage may be obscured. If their vehicle becomes stuck due to snow, they should engage the differential lock or use the highest possible gear to improve traction, keeping use of the exhaust brake to a minimum.

Roads can still be dangerous after the precipitation stops. Snow storms are often accompanied by strong winds, even after the snow has ended, creating sudden white-outs that dramatically lower visibility.





Changing elevation also causes rapid changes in precipitation types. Moving from valleys to mountain passes can see precipitation quickly change from rain to snow and back again.

In icy conditions drivers need to allow approximately 10 times the normal braking distance, and avoid heavy braking as this can cause vehicles to jack-knife. They should also be prepared for road conditions to change over relatively short distances, and should slow down, particularly for bends in the roads. If the ice has become tightly packed, driving in a higher gear may improve the vehicle's grip.

**AUTHOR**

When this webinar was broadcast, **Richard Leonard** was head of road safety at **Highways England**

## Preparing your vehicle

by **Andy Price**

Journeys should only be conducted during adverse weather conditions if absolutely necessary. However, if a journey is critically important, fleet managers must ensure their vehicles are as well-equipped as possible to make the journey safely.

All vehicles must be fit for purpose, and if they are required to make journeys in adverse weather conditions the vehicle specification must reflect this. For example, if employees are expected to drive during or after heavy snowfall, or on untreated roads, vehicles should have four-wheel drive; if operating in countries where extreme heat can be encountered, air conditioning should be specified.

However, it is impossible to completely eliminate the risk posed by adverse weather even when vehicles are suitably equipped. This means fleet operators should ensure that they have a mechanism to assess the safety of each journey during adverse weather conditions, regardless of what vehicles are in use.

You should also ensure that any employee who is making a journey in adverse weather conditions tells their manager of their planned route and estimated time of arrival, so that they can be traced in the event of an emergency or if they get stuck in an area where there is no phone signal.



## Additional safety equipment

If there is a risk that employees must make journeys in extreme weather conditions, additional safety equipment should be considered.

Drivers must have a charged mobile phone to use in case of emergencies, such as becoming stranded in snow. Drivers should also be reminded that the phone should only be used if they have stopped the vehicle in an area where it is safe to do so, and should never be used while they are driving under any circumstances.

Other equipment to consider for cold weather conditions includes:

- an ice scraper and de-icer
- a shovel
- warm clothing or blankets
- a high-vis jacket
- a warning triangle
- a torch and spare batteries
- food and drink
- a first-aid kit.

## Vehicle maintenance

Employees should always be driving a well-prepared and maintained vehicle in any circumstances, but this is especially true when they have to make journeys in adverse weather conditions. All vehicles should be serviced in line with the manufacturer's recommended schedule, to minimise the risk of breakdowns.

Certain basic routine maintenance measures should also be regularly conducted to ensure the vehicle is properly prepared.

All operators must ensure that vehicle lights are functioning correctly, including checking they are clean and the bulbs are working. Oil, water and fluid levels must be all significantly above minimums.

Vehicles must also have sufficient fuel before commencing any journey in bad weather conditions, with enough spare for contingencies such as getting stranded. If required, this will allow the engine to be run periodically to help drivers stay warm.

The engine coolant should be topped up as required, especially when operating in extreme heat, and the oil level should be topped up when required, to minimise the chance of a breakdown and make sure that the right specification of oil is being used based on the expected temperatures.



## Tyres

Tyres, including the spare tyre, should be regularly checked to ensure they are inflated to the correct pressure and have the correct tread depth. Failing to do so will increase the vehicle's braking distance and make skidding more likely.

Ideally, car and van tyres should be replaced when tread depth reaches three millimetres, as braking performance in wet weather deteriorates rapidly after this point. However, it is common for tyres (especially on leased vehicles) not to be replaced until the tread depth reaches 2mm. Fleet operators can specify when tyres should be changed according to their needs.

In countries where winter tyres are not mandatory, but temperatures are often below seven degrees Celsius (where winter tyres perform better than summer tyres), there may be benefits to fitting them, although they do not completely eliminate the risk posed by snow and ice.

In some countries, especially in mountainous areas, snow chains or studded tyres may also be required, although use of these is often subject to additional rules and regulations, such as restricting the roads on which they can travel.

## Windows

In wet or snowy conditions, all windows, especially the windscreen, must be kept clear inside and out to help ensure the driver has maximum visibility. This will also reduce strain on drivers' eyes and reduce fatigue, especially at night or when there is glare from a low sun or reflected light off wet or icy roads.

To keep your windscreen clear:

- ensure that wiper blades are in good condition and operating correctly
- remove any film that builds up on the inside of the windscreen
- top up wiper fluid, using the correct mixture to ensure that it does not freeze, based on the ambient temperatures that the vehicle may be operating in.

The safest thing to do is not to drive during adverse weather conditions. But where a manager decides that a journey is of critical importance, employees should be using a vehicle with the correct specifications, and the correct ancillary equipment, which has been prepared to cope with the weather conditions they are likely to encounter on their journey.

### AUTHOR

**Andy Price** is director at Fleet Safety Management

## Checking and maintaining vehicles for journeys in poor weather

by **Jonathan Bates**

Adverse weather conditions cause additional wear and tear, making it even more important that vehicles are well-maintained, and essential safety checks carried out, before every journey in bad weather.

Technology can play a major part in helping fleets make sure their vehicles are being correctly checked and maintained. If a vehicle's on-board computer recognises that its engine temperature is high, or oil level is low, engineering managers can be notified in real-time so that maintenance can be planned before the situation becomes critical. Maintenance data can also be used to identify prominent trends that need to be addressed across the fleet.

At the most advanced level, predictive analytics can be used to identify in advance where problems are likely to occur. This is an effective tool in both resolving and planning for maintenance prior to catastrophic situations developing on the road and is a useful component of any road risk management strategy.

The best way to ensure vehicles are checked is through a robust and paperless programme, such as a smartphone application that drivers can fill in wherever they are. This will provide an optimum balance between an overarching vehicle maintenance programme and a more granular journey-by-journey preventative measure.

Good driver engagement also reinforces safe driving and results in affirmative action from the driver. Introducing a competitive element to driver improvement can help increase engagement and further improve results. Where a robust and engaging driver programme is in place, supported by complementary technology, fleets may benefit from reduced speeding, harsh braking and harsh acceleration, and improved driver safety.

By combining these approaches, fleets can develop comprehensive and pre-emptive risk management programmes, resulting in vehicles becoming safer to drive no matter the weather conditions.

### AUTHOR

**Jonathan Bates** is director at MiX Telematics

## Advice for fleet managers: Driving in adverse weather conditions

**Any journey in bad weather conditions puts your drivers at greater risk of a crash. As a fleet manager, you have a responsibility to make sure your drivers know how to respond to a broad range of weather-related hazards, that your vehicles are properly equipped and maintained, and that clear policies are in place outlining what to do in an emergency.**

**Plan ahead:** Make sure you know what weather conditions drivers may encounter before any journey, and plan for how they should respond to them. Technology can help provide more accurate forecasts.

**Make sure drivers know how to respond to weather hazards:** Depending on where your fleet operates, you might regularly encounter a broad range of weather conditions that may increase road risk. Drivers should know how each of these will affect their ability to safely control their vehicle, and should be trained to respond to different conditions as safely as possible, whether this means adapting their driving style or stopping and turning around.

**Provide the proper equipment:** Vehicles should have safety kits including charged mobile phones, cold-weather clothing, shovels and ice scrapers so that drivers can safely handle an emergency situation involving snow or ice.

**Ensure vehicles are well prepared:** Ensure tyres have the proper tread depth and are inflated to the correct level; top up fuel, washer fluid and coolant; and keep lights and windows clear to maximise visibility.

**Use technology for efficient vehicle checking:** Use paperless, mobile-friendly systems that make it easy for drivers to carry out essential safety checks before every journey.

## Reference

- 1 *US Department of Transportation Federal Highway Administration, How do weather events impact roads?*

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 The logo for MiX Telematics features the word 'miX' in a stylized, lowercase, black font with a green dot above the 'i'. Below it, the word 'TELEMATICS' is written in a bold, uppercase, black sans-serif font.

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