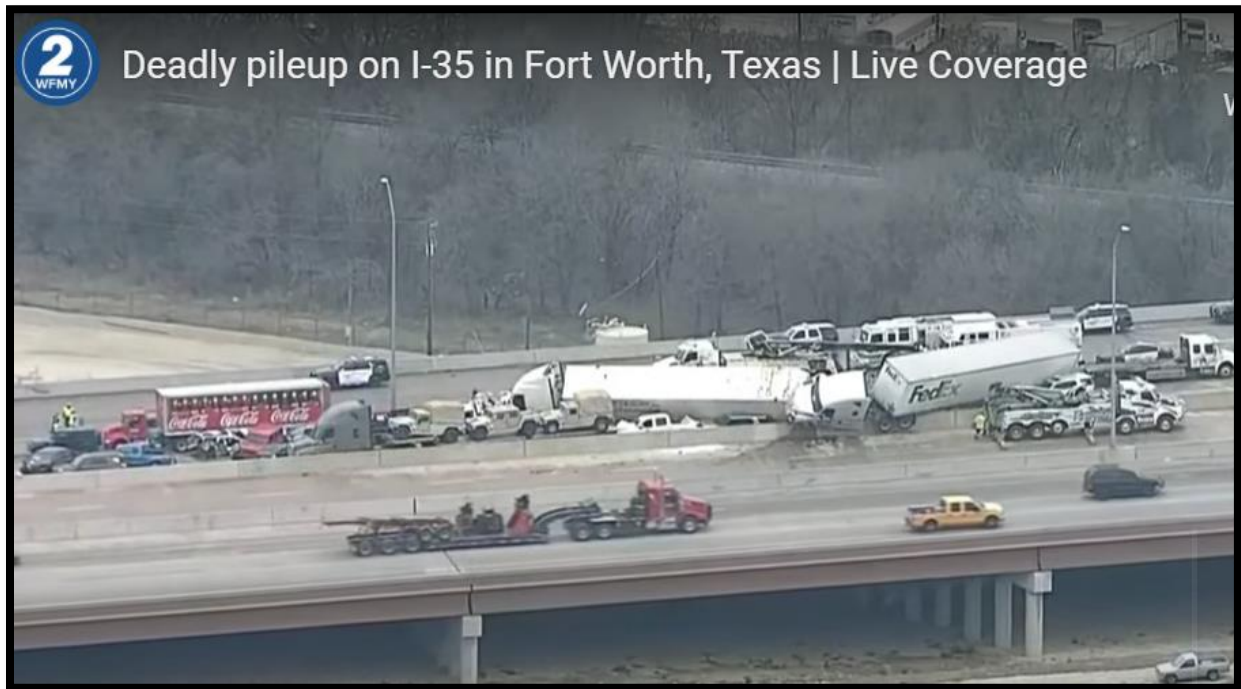
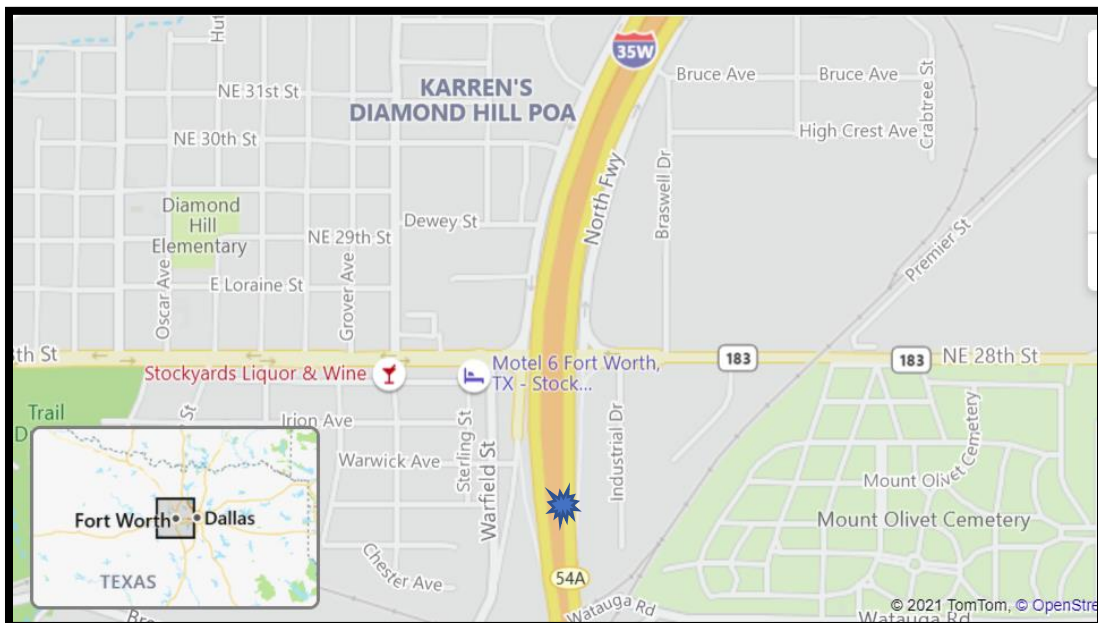


Preventing Weather Caused Pileups: There is a Solution

What can the trucking industry learn from the tragic crash near Ft. Worth?



The Ft. Worth, TX crash on February 11, 2021 made headlines across the country. The early morning crash on the I-35W involved 133 vehicles, which resulted in 6 deaths and more than 30 injuries. Video shot by passers-by and shared on social media showed numerous cars, SUVs, and 18-wheelers losing control as they came over a small hill on the southbound lanes, on to an elevated road section of the I-35W just past 28th Street, then smashing into each other.



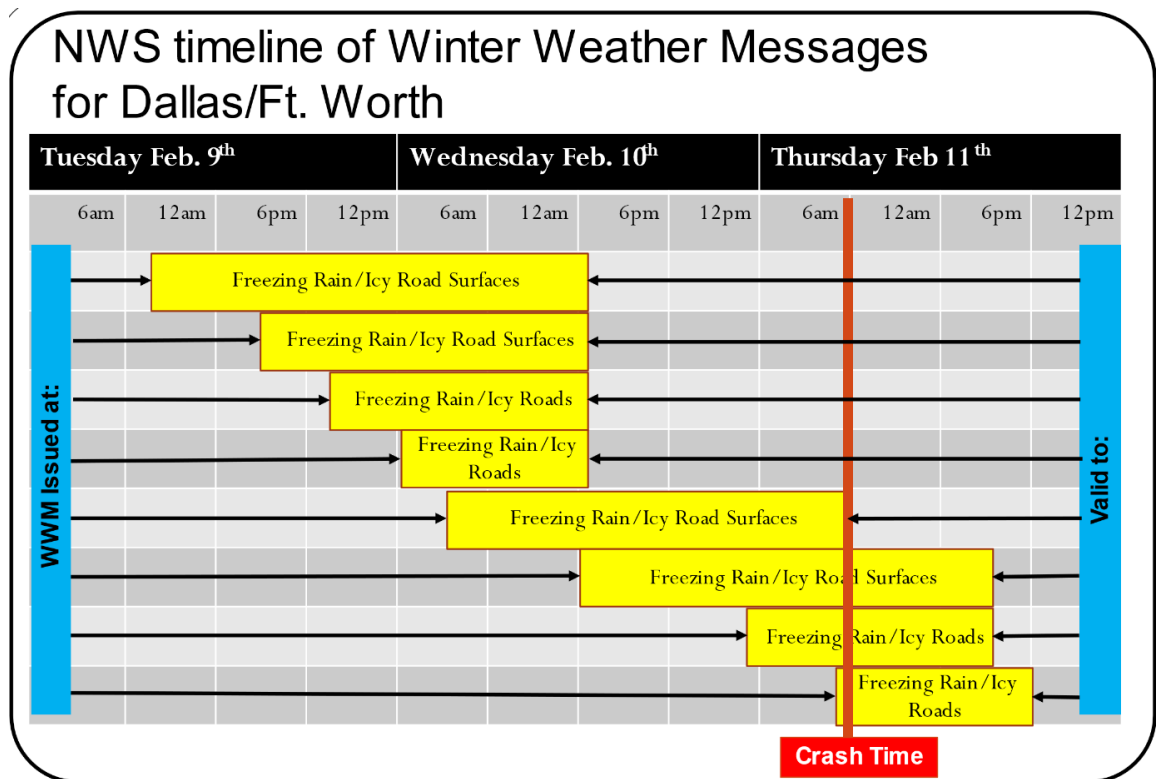
The dramatic nature of the crash, coupled with the damage it caused, has prompted an investigation by the National Transportation Safety Board (NTSB). About 16 semi-trucks were involved. The first lawsuit against trucking companies has already been filed by lawyers for a few survivors of the crash. The lawsuit accuses five trucking companies of improper training of drivers, negligent hiring, and inadequate supervision. <https://cdllife.com/2021/five-trucking-companies-facing-lawsuit-for-massive-fatal-ft-worth-pile-up/>

Using a search engine to query big rig crashes on icy roads shows that the Ft. Worth crash was not an isolated event. In fact, the internet has numerous images and videos from similar crashes across the entire nation.

The past year has been a challenge for all trucking companies. Changes in operating procedures to cope with the pandemic, new demands from clients for on time delivery, shortage of trained drivers, and modifications to regulations were all factors in the evolving landscape for trucking companies. The extreme cold weather outbreak in the central plains added to the difficulties of managing a trucking business. Nevertheless, failure to find effective ways to manage risk exposes a trucking company to the potential for huge losses. This paper brings new sources of data and new technologies to light that can help a trucking company manage their risk. By activating these solutions, companies will be able to respond to questions such as “what did you know and what could have been done about it?”

National Weather Service (NWS) Warnings

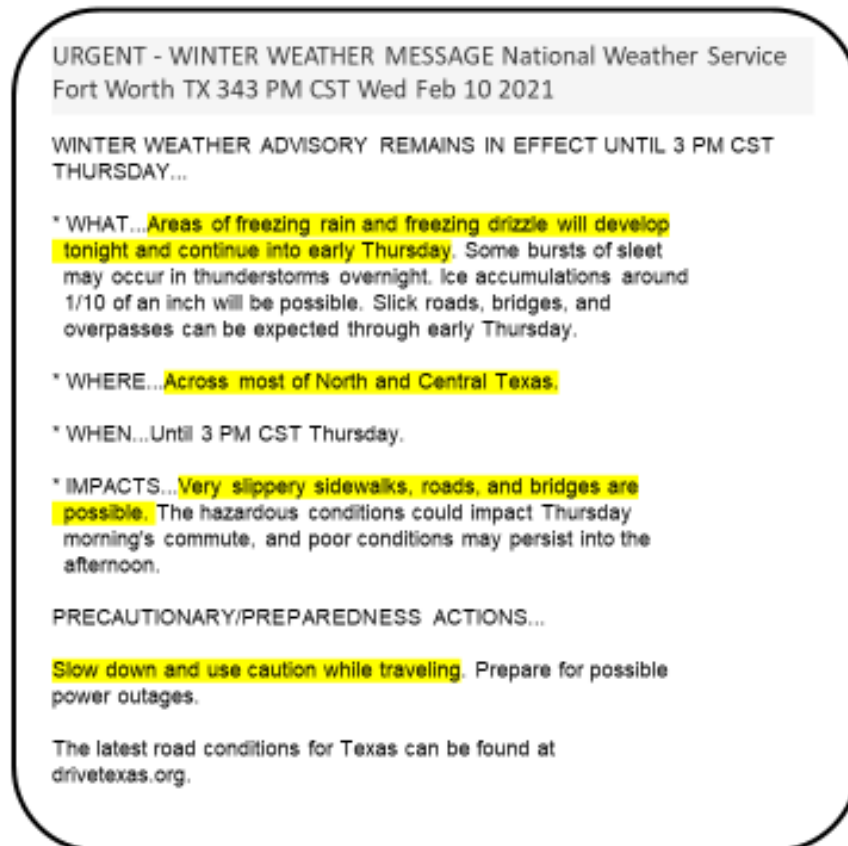
In the Ft. Worth crash, weather forecasts from the National Weather Service (NWS) for the days leading up to the crash were explicit and issued as urgent Winter Weather Messages (WWMs) starting two days



before the crash. The graphic below shows the sequence of the NWS messages. The NWS had been forecasting unusually cold weather for the central plains a week before this crash. The WWMs for

Dallas/Ft. Worth that warn of cold temperatures, potential freezing rain and snow were issued between 7 am Tuesday and 5 am Thursday. The issue time, date, and valid period are illustrated by the yellow bars in the graphic.

This WWM issued on the afternoon of February 10th (14 hours before the crash) is typical. The highlights were added by the authors.



All eight messages issued by the NWS warn of freezing rain and freezing drizzle across most of North and Central Texas. They all contain a Statement of Impacts that reads, “Very slippery sidewalks, roads, and bridges are possible.” They also contain the following caution, “Slow down and use caution while traveling.”

In these conditions, the Texas Commercial Driver’s License Manual (Section 2, page 2-14) states: *“There are some road conditions that reduce traction and call for lower speeds ... Wet roads can double stopping distance ... Reduce speed by about one-third (e.g., slow from 55 to about 35 MPH) on a wet road ... On packed snow, reduce speed by a half, or more ... If the surface is icy, reduce speed to a crawl and stop driving as soon as you can safely do so ... When the temperature drops, bridges will freeze before the road will. Be especially careful when the temperature is close to 32° Fahrenheit.”*

What could you have known and what could you have done about it?

With 16 semi-trucks involved in the crash, something is not working between operations management and drivers. Operations is not getting timely data to drivers and drivers are going too fast for the road surface conditions. More specifically, there is nothing in the cab of a semi-truck that provides alerts and

specific speed guidance that uses road surface conditions, weather forecasts, road geometry, truck configuration, and load to provide the driver with a recommended safe speed.

To manage risk, thoughtful trucking managers will also prepare a response to “what could you have known and what could you have done about it?” Using this crash as background, what can be done to prevent or reduce these crashes in the future?

1. Trucking companies can monitor weather alerts issued by the NWS by setting up an internal system or purchasing a service from a private supplier.
2. Trucking companies can establish pre-determined rules for changes in operations to respond to weather forecasts.
3. Trucking companies can use technology to issue driver alerts and operations instructions in response to weather forecasts that are geographically focused and timely.
4. Drivers can be trained to respond to the new operational safety rules related to weather alerts.
5. Trucking companies can monitor trucks in their fleet that are operating in the alert area to ensure compliance.

Greater ‘Duty of Care’ for Drivers and Companies

Managing risk at trucking companies also requires executives to be aware of recent court decisions related to ‘duty of care’. The duty of care of a commercial trucking company requires companies to train their drivers and provide management oversight.

<https://www.freightwaves.com/news/werner-verdict-texas-crash>

Drivers also have a required ‘duty of care’ as well. A recent on-line post by Jeffrey Carr quoting attorney Keith Purdue, points out that professionally trained drivers also have a higher duty of care that is cited in law as well as in CDL manuals. Purdue referred to the Code of Federal Regulations 49 CFR Section 392.14, which imposes a duty on commercial drivers in inclement weather. When weather conditions make for hazardous roadways it triggers a duty that professional truck drivers owe to other motorists. This duty obliges truckers to slow down. If conditions are bad enough to make safe driving impossible, then drivers must stop driving altogether.

In the noted 1-35W crash, plaintiff’s lawyers will likely try to establish that this higher duty of care was ignored by the drivers named in the lawsuit and the companies that employed them.

www.injuryrelief.com/blog/what-are-reporters-missing-about-the-6-x-fatal-133-car-pile-up-in-fort-worth-tx/

What is not known but could be asked in court, is ‘did any of the trucking companies involved in this crash issue warnings to their drivers or require the drivers to cease operations?’ If not, why not? Just a few weeks later, a severe blizzard was forecast for the east slope of the Rocky Mountains from Denver, CO north to Cheyenne, WY. The air transportation industry responded by closing the Denver airport and cancelling over 2,000 flights. Did the trucking industry respond to the freezing rain forecast in Central Texas in February with the same urgency?

Is a Weather Warning Enough?

It may be that the norm across the industry is that weather information is ‘provided’ to drivers to empower the driver to make the call as to what they feel they can safely do (“the driver is the Captain of the ship.”). However, thoughtful trucking company managers know that drivers are generally paid based upon a piece-rate model (pay per mile). Driver pay methodologies encourage poor weather decision-making by drivers who are financially disadvantaged when they choose to shut down. This is

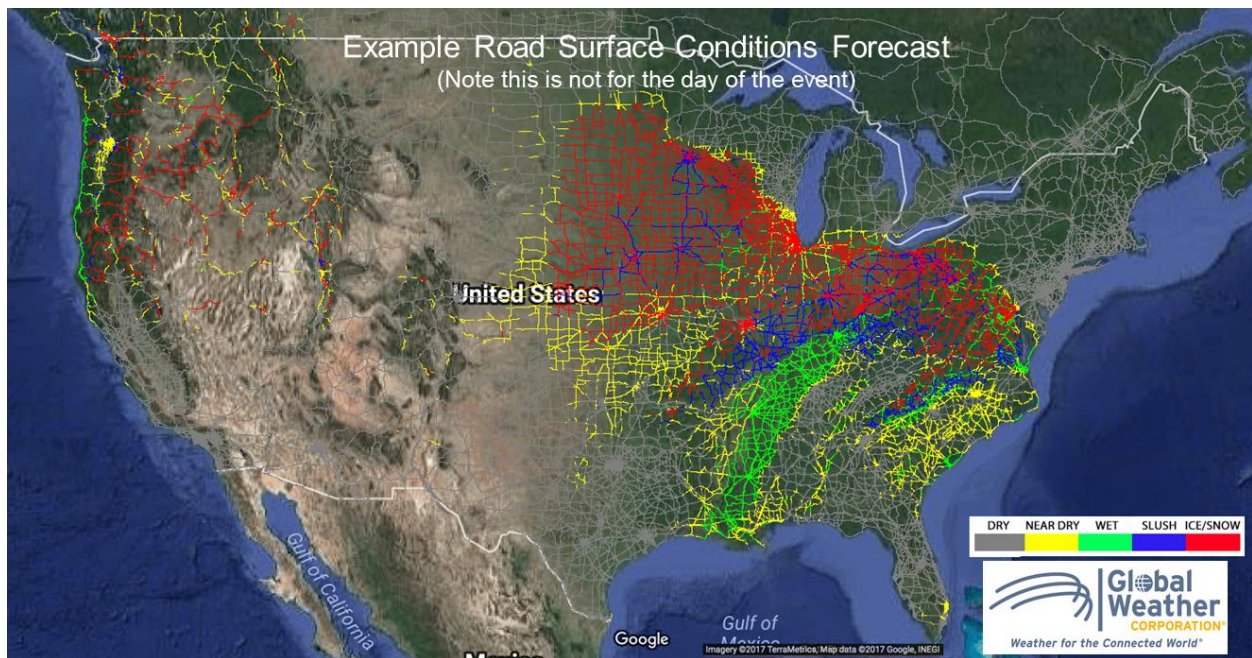
compounded by the fact that drivers do not have information on current road surface conditions and what a recommended safe speed for that condition might be.

An additional complicating factor is the hyper-focus on service (on-time deliveries) for shippers who use "just-in-time" logistics models for their supply chains. The result manifests itself in pressure on drivers to continue to drive, even when the conditions make that decision imprudent. Some large shippers have gone so far as to not recognize weather as an acceptable reason for a late delivery. Compounding that issue is that some shippers pay carriers a bonus (higher pay per load) if the load is delivered on time. This puts pressure on the carrier to put pressure on the driver to "press-on" (even in bad weather).

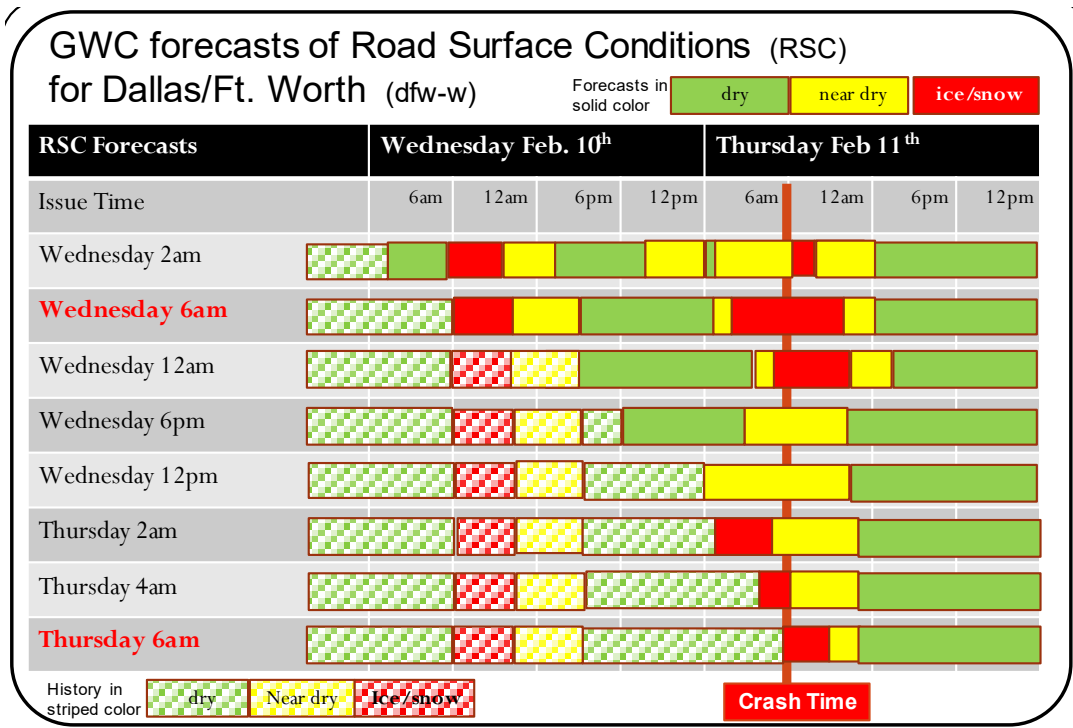
Thus, to manage risk, carriers need better and more reliable ways to communicate location specific, relevant, real-time weather and road surface conditions to their drivers to enable better decision-making. Sending fleet-wide weather information to drivers in San Diego about bad weather in Boston desensitizes drivers to those messages and, even when it may be relevant to them, they are conditioned to ignore the messages.

Moving from Forecasts to Recommended Safe Speeds based on Road Surface Conditions RSC)

Global Weather Corporation (GWC) employs an industry leading atmospheric forecast and a physics-based model of the road surface to compute how the road conditions (e.g., dry, wet, snow covered and icy) respond initially to rain or snow, and when and if the road freezes or dries after rain or snowfall ends.



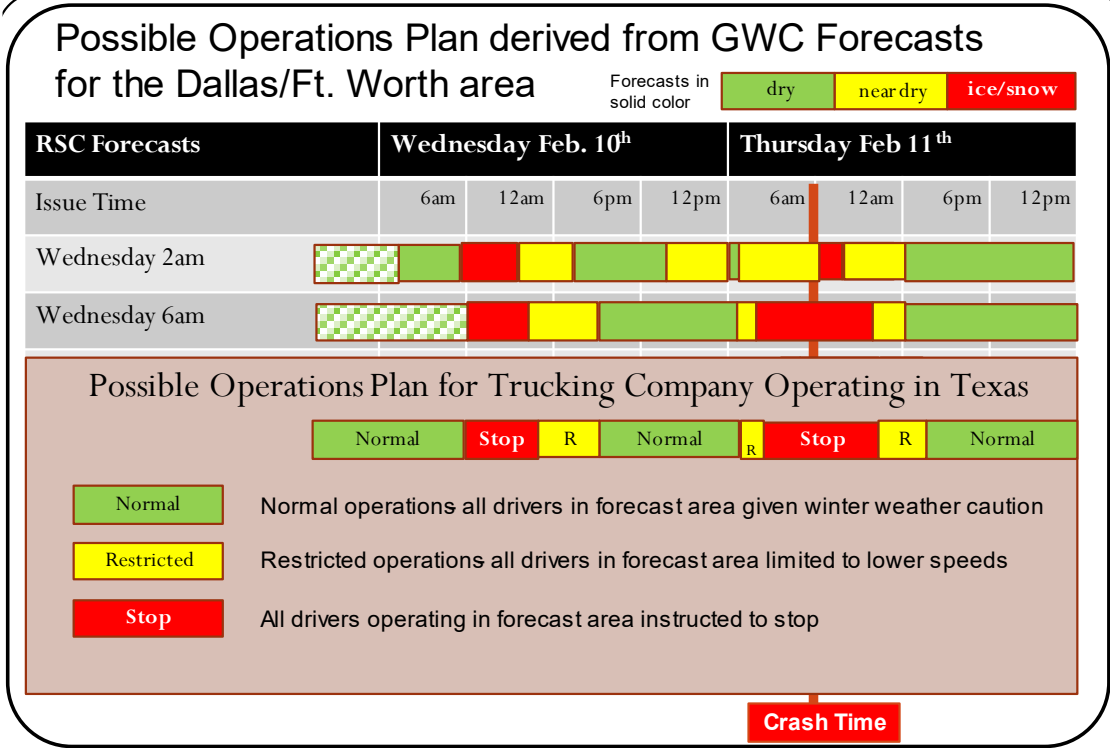
In the graphic below a sampling of the forecasts of RSC provided by GWC for the precise location of the Ft. Worth crash is shown for February 10th & 11th. GWC issues RSC forecasts every hour for all Class 1 & Class 2 roads in the US, as well as forecasts for bridge/overpass locations. Each forecast contains the predicted road surface condition, road surface temperature, water/snow depth on road, and type and amount of precipitation. This detailed forecast, which is the bridge configuration from GWC, illustrates that even in this unusually severe winter event there were still 10 to 12 hours per day with a dry roads forecast.



Currently, there is nothing in the cab of a semi-truck that provides alerts and specific speed guidance that use the road surface conditions, weather forecasts, road geometry, truck configuration, and load to provide the driver with a recommended safe speed. Fortunately, new technologies are appearing that can improve safety on the road by providing timely and geospatially relevant alerts to drivers.

RoadAware Safety Systems LLC. and GWC are teaming up to offer a new service that combines forecasts of road surface condition, weather alerts from the NWS, and a driver alerting technology. RoadAware provides a driver alerting system called **Road-Aware**, designed to keep drivers safe on curves, slopes, and connector ramps. **Road-Aware** uses GPS technology (speed and location), vehicle dynamics (power unit, trailer type, load type and weight), plus a 3-dimensional road network to calculate tip over and stopping distances for curves and slopes. By adding the forecast road surface conditions to the **Road-Aware** warning technology, the calculated, recommended safe speeds can be adjusted to account for non-dry road surfaces.

During trials, RoadAware saw that professional truck drivers, as ‘captains of their own ship’, were putting their loads, equipment, personal safety, and customer relationship at risk by driving too fast through curves and down descents. This was not because drivers wanted to put themselves at risk but because they did not understand the specific risk, rollover, or stopping distance for a given curve or slope. However, driving performance was improved when drivers were provided with timely alerts and the correct, calculated safe speed for the next curve or descent. By adding a road surface condition component to its driver alerting functionality, location specific information can be provided to the ‘captain’ for better decision making before reaching a hazardous road situation.



Failure to Implement

Failure to implement effective ways to manage risk exposes a trucking company to the potential for huge losses. The idea of leaving weather safety decisions to the driver is clearly not working. Major sporting events have long ago taken away control for initiating delays due to dangerous weather, specifically lightning, from on-field officials and placed the decision in the hands of trained safety officers who have direct access to information from meteorological experts. Trucking companies that make safety their top priority must do the same.

New sources of data, new technologies and hybrid solutions can help a trucking company manage their risk. Advanced warnings and calculated safe speed based on truck and load specifics, three-dimensional road parameters, road surface conditions, and engineering calculations can help a driver be prepared for hazardous road situations.

By activating these solutions, companies will be able to take control of safety in daily operations. Good management practices coupled with advanced technology and training can reduce or even eliminate these tragic multi-vehicle crashes.

Garth Lawrence, *Managing Director at RoadAware Safety Systems LLC* glawrence@road-aware.com
Brian Bullock, *Founder & Principal at RoadAware Safety Systems LLC* bbullock@road-aware.com
Danny Cheresnick, *Director of Customer Operations & Chief Meteorologist at Global Weather Corporation* dcheresnick@globalweathercorp.com

