Just as cold weather wreaks havoc on roads and bridges, it creates multiple challenges for railroads. Operating 24/7 over nearly 140,000 miles of track, freight rail’s infrastructure and equipment are essentially an outdoor production line exposed to all types of winter weather — from Chicago’s “Snowmageddon” blizzards to the Sierra Nevada’s wet, concrete-like snow. Snow drifts can cover tracks, moisture can freeze in airbrake hoses and frigid temperatures can affect steel rails.

**Year-round Planning**

Railroads work year-round to reduce the likelihood of winter-related service issues by investing in their network, implementing best practices and preparing employees and operations ahead of the winter months.

Investing: Included in the well above $23 billion a year over the past five years freight rail spent on its network, railroads restore, upgrade and/or purchase new winter equipment and technology. For instance, in mountainous territories where avalanches are a threat, some railroads use pneumatic cannons to prevent overhead snow from accumulating. Other railroads have erected “snow sheds,” which allow descending snow to pass over the tracks without causing damage or interrupting service.

- **Ongoing Inspections:** As part of ongoing track and equipment inspections, railroads use advanced technologies, including smart sensors alongside tracks that help identify potential track and equipment defects before problems arise.

- **Advanced Planning & Forecasting:** All Class I railroads have winter plans. Many also have a private weather forecasting service that can issue warnings earlier than the National Weather Service, allowing railroads to make informed operational decisions ahead of a storm.

- **Staged Resources:** By late fall, railroads have snow-fighting resources such as plows and heavy-duty blowers in place. Planning teams frequently meet to adjust resource locations and ensure other equipment such as locomotives and vehicles are ready for changing weather patterns.

**KEY TAKEAWAY**

Current research shows climate change is not only heating up the planet but also increasing the severity of winter storms. Through year-round planning, advanced technologies, strategic resource allocation, specialized equipment and coordination in critical areas like Chicago, freight railroads are building a more resilient network to ensure safe operations no matter the weather-related challenge.
Response

At centralized command centers, key personnel monitors the rail network and weather forecasts in real time. Using up-to-date information, they rework train schedules, deploy and manage crews, reroute trains and/or modify operations as needed.

- **Rapid Deployment Teams:** From signal and track repair crews to mechanical engineers, railroads deploy specially-trained, rapid response teams to remove snow and resolve equipment issues that can lead to service interruptions. With specialized machinery and years of experience, these employees are well-equipped to handle weather-related challenges and keep the railroad open and operating safely.

- **Rerouting Trains:** To reduce customer impact, railroads will shift shipments onto unaffected lines or leverage pre-determined re-routing agreements to move traffic onto another company’s line. Railroads keep customers updated on any service changes throughout the duration of the weather event.

- **Specialized Snow Fighting Equipment:** When there is too much snow for a locomotive’s snow plow to handle, railroads use custom on-track machinery. Massive bulldozers move tons of snow at once, while “Jordan Spreader” cars use V-shaped fronts and arms that extend out 20 feet to move tons of snow from the tracks. During the heaviest snowfalls, railroads deploy rotary snow plows with large spinning blades that dig into snow and throw it off the tracks.

- **High-tech Locomotives:** Locomotives contain air dryers that keep mainline train brake systems from freezing and heated headlights that melt snow and ice. They also have Automatic Start Stop systems and auxiliary power units that keep the engine systems warm when powered down. Railroads may place an additional locomotive in the middle or the end of a train to help maintain air pressure for brakes.

- **Keeping Critical Equipment Working:** Railroads use specialized heaters that prevent switches from freezing so trains can move from one track to another.
Chicago Coordination

Winter weather can be especially challenging in Chicago, where 500 freight and 760 passenger trains pass each day. In 1999, the region experienced the second worst blizzard of the 20th century. Up to 22 inches of snow and subfreezing temperatures impacted rail operations for months. In response to this devastating weather, the rail industry established the Chicago Transportation Coordination Office (CTCO) to keep trains safely and efficiently moving through the region.

To help meet this goal, the CTCO created the Chicago Integrated Rail Operations Center (CIROC), a high-tech, 24/7 command center where railroads continually watch real-time information of all rail operations in the region, which is fed in from sensors placed across the network. Together, commuter, passenger and freight railroads review plans, implement changes, reroute traffic as needed, and ensure resources and procedures are in place based on each division’s unique conditions and challenges.

10 Winter Network Safety Tactics

Today’s tech can monitor trains and their components in real-time, helping them operate well, even in poor conditions. Here are ten examples of how freight rail maintains a safe and efficient network during a deep freeze:

1. **Airy Dryers:** Moisture in the brake system of mainline trains can freeze. That’s why locomotives contain air dryers that remove moisture and keep operations safely moving.

2. **Headlights:** Locomotives often use LED headlights because they are energy efficient. Since LEDs don’t get very hot, the headlights are equipped with heaters to melt snow and ice.

3. **Hot Tech:** Railroads use a variety of technologies, including computer-controlled start-stop systems, low idle settings and auxiliary power units to keep locomotive engines safely working in cold weather.

4. **Command Centers:** At centralized command centers, key personnel monitor the rail network and weather forecasts in real-time to coordinate efforts such as crew deployment, maintenance and contractor management.

5. **Blizzard Buses:** Each year, railroads invest millions to upgrade existing and purchase new winter equipment such as industrial-sized snow blowers and “blizzard buses” for crew transportation.

6. **Early Warnings:** Railroads implemented an early warning system to assess real-time data and trigger operational contingency plans such as rerouting traffic in Chicago. Before winter weather even hits, railroad logistics managers plan alternate routes to keep traffic moving.
7. **Employee Gear:** It may be freezing, but railroad employees are bundled up and warm. Providing cold weather gear, training and transportation are just a few things railroads do to keep employees safe and comfortable in cold weather.

8. **Snow Plows:** Mainline locomotives are equipped with snow plows that remain in place year-round. When there is too much snow for the locomotive to handle, railroads use specialized on-track machinery to clear the tracks.

9. **Additional Track:** Winter weather can make it hard to move freight cars in railroad terminals. By building additional tracks within rail yards, railroads can store more trains and relieve terminal congestion.

10. **Rapid Response Teams:** During severe winter weather, railroads safely deploy rapid response teams to immediately remove snow and resolve mechanical and service interruptions.