Preventing Collisions Through
Positive Train Control

For the past ten years, 40 railroads (freight and commuter lines and Amtrak) have been working with the Federal Railroad Administration and major telecommunications suppliers to create a wireless system to control train movements nationwide. This gigantic project, Positive Train Control (PTC), is the result of the 2008 Rail Safety Act, passed by Congress after a deadly accident in September, 2008, when a California commuter train engineer, distracted by his cell phone, allowed his train to ram into a freight train, killing 25 passengers and injuring a hundred more.

The protection of rail passengers was the driving force behind the new legislation. Many commuter lines and Amtrak share freight train tracks.

Three main objectives of PTC:

1. Keep trains separated to avoid collisions.
2. Prevent derailments caused by excess speed or mis-aligned switches.
3. Safeguard railroad work crews on mainlines.

The magnitude of the task to control train movements across the continent can be grasped when we consider that the U.S. has the densest rail network of any country. At any given hour, 10,000 or more trains may be in operation across North America.

Collectively, the participating railroads will spend more than $22 billion to build the vast computer network, radio towers and other equipment that will be needed. Thousands of locomotives will be equipped with PTC computers, and tens of thousands of rail workers will be trained to work with PTC.

Inside the locomotive cab, PTC computers monitor and advise the locomotive engineer on every aspect of train operation.

By 2020, some 60,000 miles of mainline track are expected to be protected by PTC. Ultimately, all railroads, including shortlines, will be required to implement inter-operable PTC systems.

PTC goes far beyond existing train control systems by harnessing GPS technology with high-speed computer data processing to form an integrated system of command and control over the nation's main rail lines. When fully operational, PTC dispatch centers in each railroad will know where every train is located in their territory at any moment in time.

Here's how PTC works.

Computers on board PTC-equipped locomotives calculate the train's location, direction and speed from GPS signals and communicate this ever-changing information to PTC dispatch centers. PTC centers also receive constant information on train size: number and type of engines, number and gross weight of cars, and any change to the train consist enroute.

PTC data banks will include complete and current track conditions — every curve and change of grade, the length of passing sidings, the location of every switch, block signal and crossing gate.

Wireless detectors installed along the tracks will update the system when a switch is not lined properly or a highway-rail crossing gate is not working.

From this massive and continual exchange of data, PTC computers will be able to determine when a train has to slow down or stop to avoid collision with another train. If the locomotive engineer does not apply brakes at the proper time, or the train speed is too great for conditions, PTC Command will send a warning to the engineer. If the engineer does not respond properly, PTC computers will take over control of the train to slow it down or stop it. The aim of PTC is to remove as much human error and inattention as is possible in the running of trains.

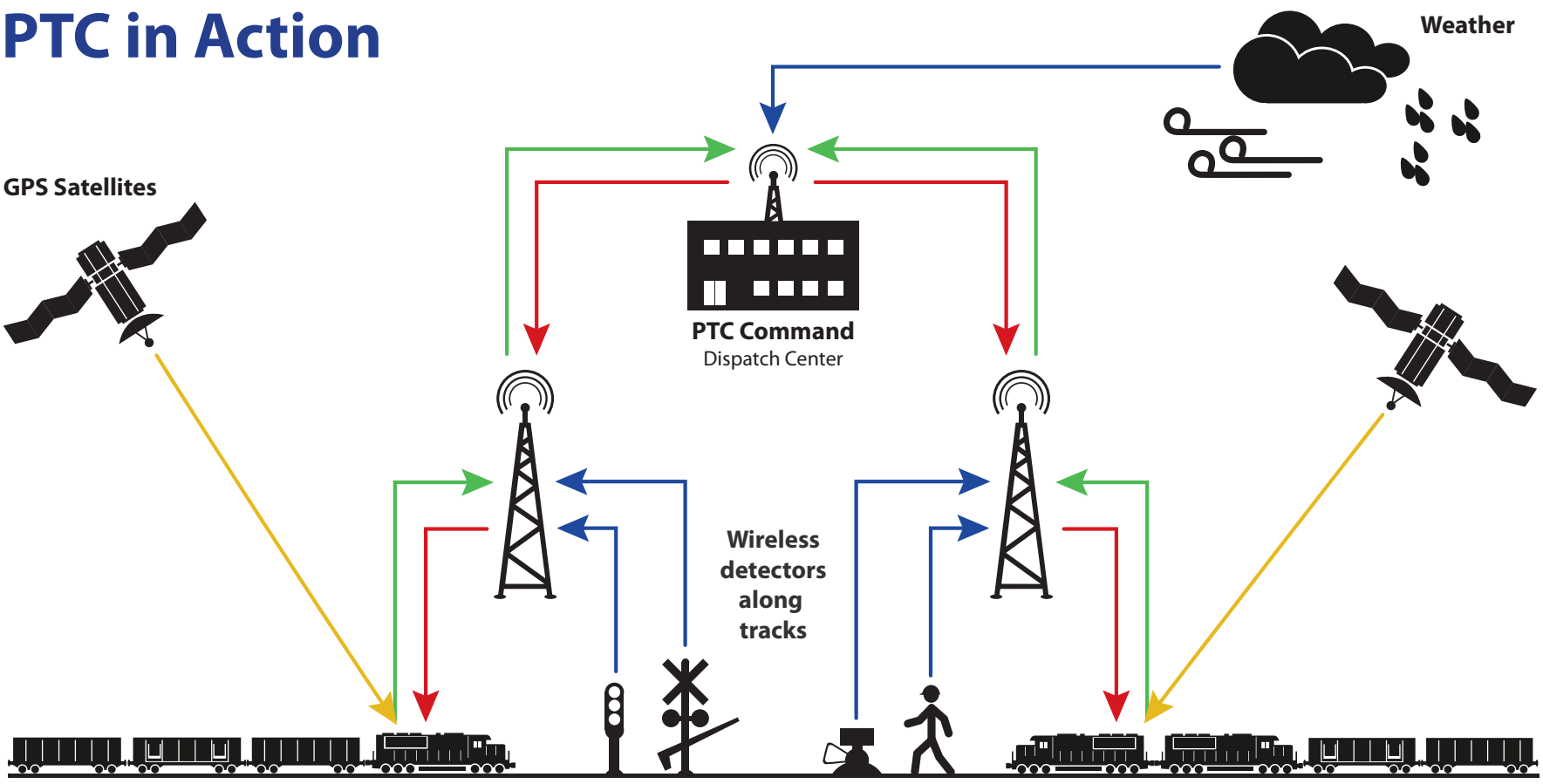
Each railroad is developing their own form of PTC, but all systems must meet FRA basic standards and be inter-operable with neighboring railroads.

PTC promises to bring railroad safety to its highest level by removing the causes of collisions and derailments on controlled tracks. Further improvements will be made once all 40 participating railroads have fully implemented their PTC operations.

The greater co-ordination of shared track train operations under PTC will result in more efficient scheduling and far safer passenger rail service. Both outcomes will encourage greater use of rail travel by the public.

As of September 30, 2018, PTC is operating on 71% of major freight rail routes and 26% of passenger routes (41,000 miles of track). Twenty-four of the 40 participating railroads have 100% hardware installation complete; eleven more roads are 95-99% there. The remaining five "at-risk" railroads including Amtrak, have until December 31, 2020 to be hardware-ready for PTC operation.

PTC in Action



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