

Future Train

diagram by flying-chilli.com

Faster Data Flow

Up-to-the-minute information is critical if railroads are to move more freight without compromising safety. In a positive train control (PTC) system, locomotives are monitored using differential GPS, which relies on data from ground-based stations as well as satellites. The data is fed to a central control center, where dispatchers monitor factors such as track conditions, weather and delivery deadlines. Instructions and information are transmitted to each train wirelessly.

Cleaner Engines

Electro-Motive's 200-ton-plus, 4300-hp SD70ACe locomotive, illustrated here, meets new EPA emissions regulations. Between them, Electro-Motive and GE build most of the locomotives used in North America.

Bigger Loads

An increasing volume of cargo arrives in the nation's ports in intermodal containers, which are typically 20, 40 or 45 ft. long. Most leave on double-stacked cars. Articulated cars (not shown), which pivot in the middle, are longer than conventional cars and can carry more freight. A single car's load has increased from 100 tons to as much as 112 tons.

Safer Cars

Hazardous materials such as chlorine travel in tank cars with shelf couplers, which limit vertical movement. This prevents a coupler from accidentally disengaging and puncturing the tank car. GPS-enabled sensors can alert dispatchers to leaks and other dangers. (The tank car below is placed behind the locomotive for illustration; in reality it would be five or more cars back.)

Smarter Brakes

Unlike the conventional technology, electronically controlled pneumatic (ECP) brakes allow an engineer to apply stopping power to all of a train's cars at once. An electronic signal is sent to each car, where air pressure is fed through the cylinder line to apply the brakes. The system is charged with air from the train's main brake line.

