

technology TODAY

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The Jet Train

IN 1997, the Thrust SSC jet car set a new world land-speed record in the Nevada Desert when it traveled faster than the speed of sound. This jet car actually attained Mach 1.020 on a run that averaged 763.035 miles per hour.

The Thrust SSC's fantastic technological achievement shows the potential for super-fast land vehicles. However, no one expects to see a viable hybrid jet engine car on our highways or in our garages in the near future.

produces major dynamic forces that border on the working loads of most pre-existing track routes.

The FRA further indicates that the dynamic load of running super-fast diesels would increase track maintenance to the point that the railroads couldn't be profitable.

On October 15th, 2002 Bombardier Transportation Inc. and the FRA unveiled the JetTrain® at Union Station, in Washington, DC. The JetTrain® locomotive is Bombardier

Transportation's answer to an engineering challenge that the FRA established in 1998.

At that time, the Federal Railroad Administration asked train manufacturers to submit proposals for a new, high-speed, non-electric passenger locomotive that could bring high-speed transportation to most of North America's non-electrified tracks.

Bombardier is an international company headquartered in Montreal. In the past, Bombardier helped develop the high-speed TGVs found throughout Europe, the ICE train of Germany, the ETR 500 of Italy, the Talgo of Spain, the Acela of America, and even the Xinshisu of China.

The JetTrain® locomotive differs greatly from the above locomotives because a Pratt & Whitney PW 150 jet engine powers it. By replacing a diesel engine with a jet engine, Bombardier reduced locomotive weight by 20 percent while increasing acceleration speed by 50 percent.

The JetTrain® locomotive is a "greener machine" in the sense that it produces 30 percent less greenhouse gases than the diesel engine it replaces. This locomotive has 4,400

hp and still surpasses FRA noise standards at all operating speeds.

Running on standard diesel fuel supplied by the locomotive's 2,200-gallon fuel tank, this Pratt & Whitney jet engine powers a series of AC traction motors that supply power to the locomotive's wheels. The JetTrain® locomotive is a jet engine/electric hybrid vehicle.

Learn more about this JetTrain® locomotive and other Bombardier transportation systems at www.transportation.bombardier.com.

Recalling the Facts

1. Why can't you use any high-speed locomotive on all tracks in North America?
2. How does the JetTrain® locomotive's jet engine differ from those you usually find on airplanes?

Alan Pierce, Ed.D., CSIT, is a technology education consultant, technical writer, and public speaker on technology issues.



Photo courtesy of Bombardier Transportation, Inc.

Bombardier JetTrain high-speed rail

Is the future brighter for a jet train rather than a jet car?

In North America, high-speed (150 mph+) train technology has been based around an electrified rail system. Therefore, to create a high-speed electric train system throughout North America, one would need to electrify most of the non-electric rail systems throughout the United States and Canada.

The U.S. Federal Railroad Administration (FRA) estimates that electrification would cost \$3 to \$5 million per mile.

Today, diesel locomotives drive non-electric trains that have half the acceleration of their electric counterparts. The FRA indicates that diesels can't be used as high-speed train engines because their weight

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