THE TRAIN OF THE FUTURE

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The only alternatives to airplanes - feet, cars, buses, boats and conventional trains - are just too slow for today's fast-paced society. However, there is a new form of transportation that could revolutionize transportation of the 21st century the way airplanes did in the 20th century.

A few countries are using powerful electromagnets to develop high-speed trains, called maglev trains.

Maglev is short for magnetic levitation, which means that these trains will float over a guide way using the basic principles of magnets to replace the old steel wheel and track trains.

Maglev or magnetic levitation is a transportation method that suspends and propels a vehicle, usually a train, very quickly along a guide way.

Maglev trains are theoretically capable of speeds upwards of 4,000 miles per hour if operating in a vacuum.

If you've ever played with magnets, you know that opposite poles attract and like poles repel each other. This is the basic principle behind electromagnetic propulsion.

There are three basic types of maglev propulsion:

- Electromagnetic suspension uses the attractive magnetic force to lift the train.
- Electrodynamic suspension uses the repulsive magnetic force to lift the train away from the rail.
- Stabilized permanent magnet suspension uses opposing arrays of permanent magnets to suspend the train above the guide way.

The big difference between a maglev train and a conventional train is that maglev trains do not have an engine - at least not the kind of engine used to pull typical train cars along steel tracks. The engine for maglev trains is rather inconspicuous. Instead of using fossil fuels, the magnetic field created by the electrified coils in the guide way walls and the track combine to propel the train.

The idea of maglev transportation has been around since the early 1900s. The basic idea of a maglev train is to levitate it with magnetic fields so there is no physical contact between the train and the rails (guide ways).

Many maglev systems have been proposed in various nations of North America (for example, Union Pacific Freight Conveyor, California-Nevada Interstate Maglev, Atlanta – Chattanooga); Asia (Shanghai – Hangzhou, Mumbai – Delhi, Tokyo - Nagoya - Osaka), and Europe (London – Glasgow). Many are still in the early planning stages, or even mere speculation, as with the transatlantic tunnel.

The first operating maglev system was built in Britain, at the Birmingham airport in 1984, where it was used as a people mover.

Since the 1980s, Japan has been acknowledged as the world leader in the development of maglev technology.

Japan currently operates two experimental maglev trains. One is the HSST, which has been developed by Japan Airlines. The other is the JR-Maglev, which is owned and operated by Japan Railways. In April, 2007 Central Japan Railways announced that commercial maglev service would be available between Tokyo and Nagoya starting sometime in 2025.