

# Maglev trains: an analysis



MAGLEV trains are a form of transportation that includes science of magnets and implies the future of transportation technology. So what are MAGLEV trains? MAGLEV stands for ‘magnetic levitation’ which means it uses magnetic forces to move and travel. Even though this technology might seem very futuristic, it has a history that goes back to 1900s!

It didn’t start at 1909 but an American rocket scientist by the name of Robert Goddard thought of transportation system vehicles that levitated for high speed transport. Also a French engineer, Bachelet, built a model train that levitated using similar designs today. Even though these early scientists thought of this idea, they couldn’t find out a way to make this kind of transportation.

It wasn’t until at around 1960’s MAGLEV transportation research resumed. This was when technology had been more modern. James Powell & Gordon Danby developed designs for MAGLEV trains. By early 1970’s, the States had began testing reduced scaled models of magnetic levitation.

Finally, Stanford Research Institute had tested a half-ton vehicle for magnetic levitation, leading to construction of more advanced technology. This eventually lead to invention of a MAGLEV train that could aboard people safely. In 1984 the first commercialized Maglev train was officially open in England. In Japan, 2 trains were constructed and they held the fastest speeds yet, 581 km/h (2003). The maglev trains were and still are, built throughout the world and still they are being redesigned to make it faster and better.

So, after reading about the long history of this fascinating technology one thing sticks in mind, 581 km/h?! Yes, this is not some false calculation or something of that sort. So if this train can go 581 km/h then what is it made out of? This technology can be simple or very complicated, remembering that scientists Robert Goddard and Bachelet couldn't find out the formula of this system. So how does it work? The title says it all, magnetic levitation, magnets that are repelling each other so that there can be levitation. It can't be any simpler than that, but this is what the title means. Let's see how the technology works throughout the process.

If you ever played with magnet before, then you should know by now that opposites attract and alike repel. This is the basic principle of electromagnetic propulsion. This is what the train is using in basic terms.

On the maglev track, there is a magnetized coil going along the track which repels the large magnets on the train. This allows the train to levitate from between 1 to 10cm above the coil or guideway. As the train is levitated, a unique system is created of magnetic fields that pull and push the train along the track as power is supplied to the guideway. The power or electric current that is supplied to the coils is constantly alternating to change the polarity, causing the magnetic field in front of the train to pull and the magnetic field begin to 'push'. Maglev trains float on a thin layer of air which eliminates friction. This makes the train's speeds go more than 500 km/h. This brief explanation of how it works probably helped why it went so fast and also how the system works.

This train might sound all very good and you're probably thinking why doesn't everybody get this? Well there are the negative sides to this too. The probably #1 for most problem is the cost. These trains can get very handy and also are very eco-friendly to the environment just that they are close to 4~5 billion dollars to build one train system in each section. So, that is probably why this train is not in every country. Also the maglev trains have other issues like no magnetic data storage- hard drives, credit cards, separation between train and guideway has to be monitored at all times because of instability of electromagnets, and etc.

Even though the trains seem to be fine in the present right now, there are still more being built and more to come. There are many maglev systems being proposed in North America, Asia and Europe. Also there are at least 10 plans for separate U. S lines in the systems. The technology is slowly being developed everyday and so are maglev trains. There are many new theories and new developments being made and thought for the maglev systems still today.