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# IMPLEMENTING THE MAGLEV TRAIN AMONG THE UAE, KSA AND QATAR

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## SITUATION

- ▶ High fuel consumption in the United Arab Emirates, Qatar and the Kingdom of Saudi Arabia.
- ▶ Possibility of increasing tourism among these countries.
- ▶ High cost of air travel which limits the rate of tourism.



Figure 1: Map of UAE, KSA, and Qatar

## PROBLEMS

- ▶ Maintain dynamic stability along all axes for safety purposes.
- ▶ Reduce the high air drag force to the minimum.
- ▶ Find a cheap, effective superconductor to meet the design requirements.
- ▶ Select an inexpensive cooling system for the guide way.
- ▶ Find strategic locations to build the stations while still being economic.
- ▶ Find a safe way for the Maglev Train to turn.

## SOLUTION

- ▶ Using diamagnetic materials to stabilize the train.
- ▶ Building vacuum tubes to eliminate drag force.

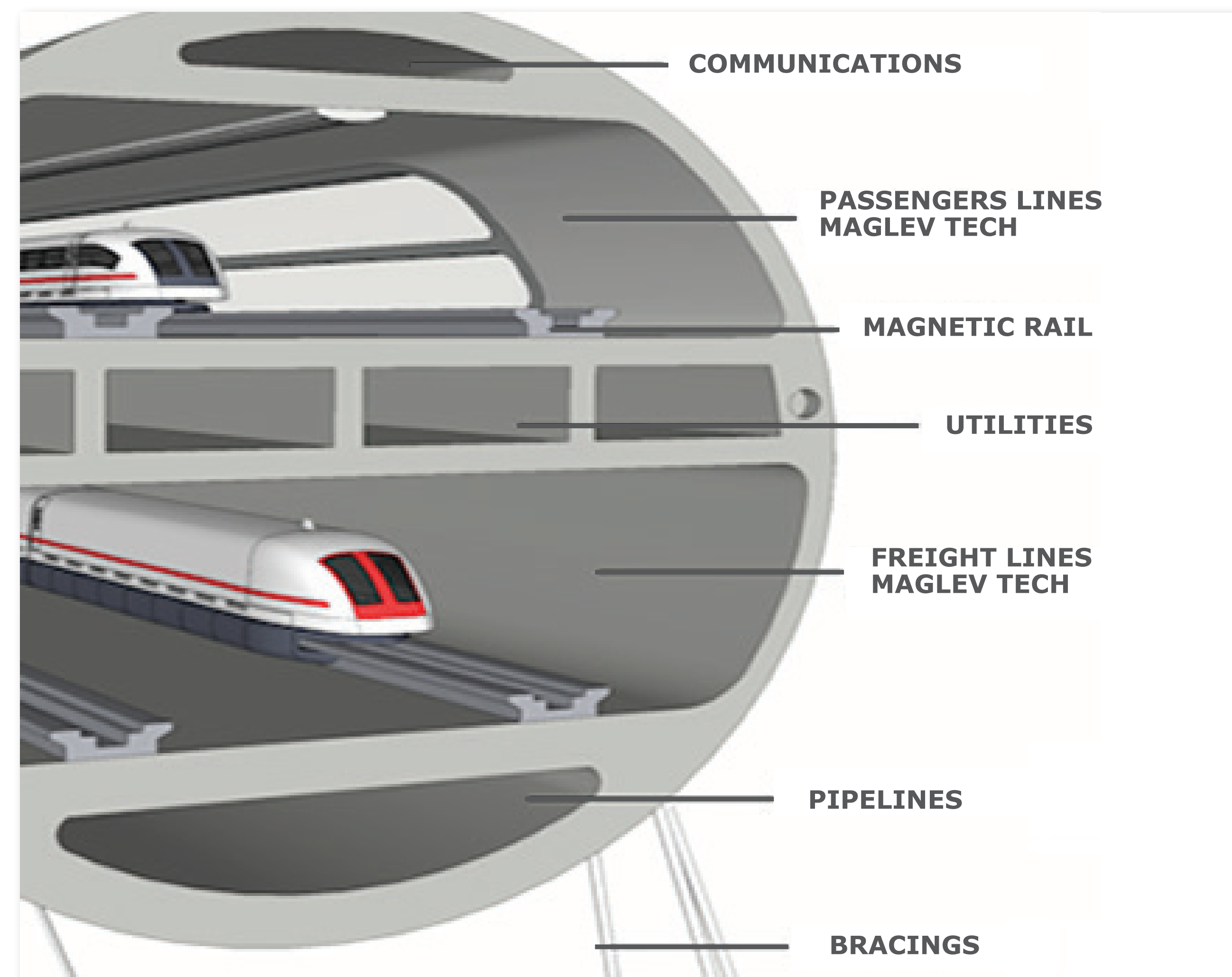


Figure 2: Maglev Train in vacuum

- ▶ Using superconductor electromagnets to minimize power.
- ▶ Selecting a Ba-Cu-O composite for superconductor material.
- ▶ Using liquid N2 as coolant for superconductor guideway.
- ▶ Building the stations as an extension in airports.
- ▶ Calculating a safe distance to turn depending on the speed.

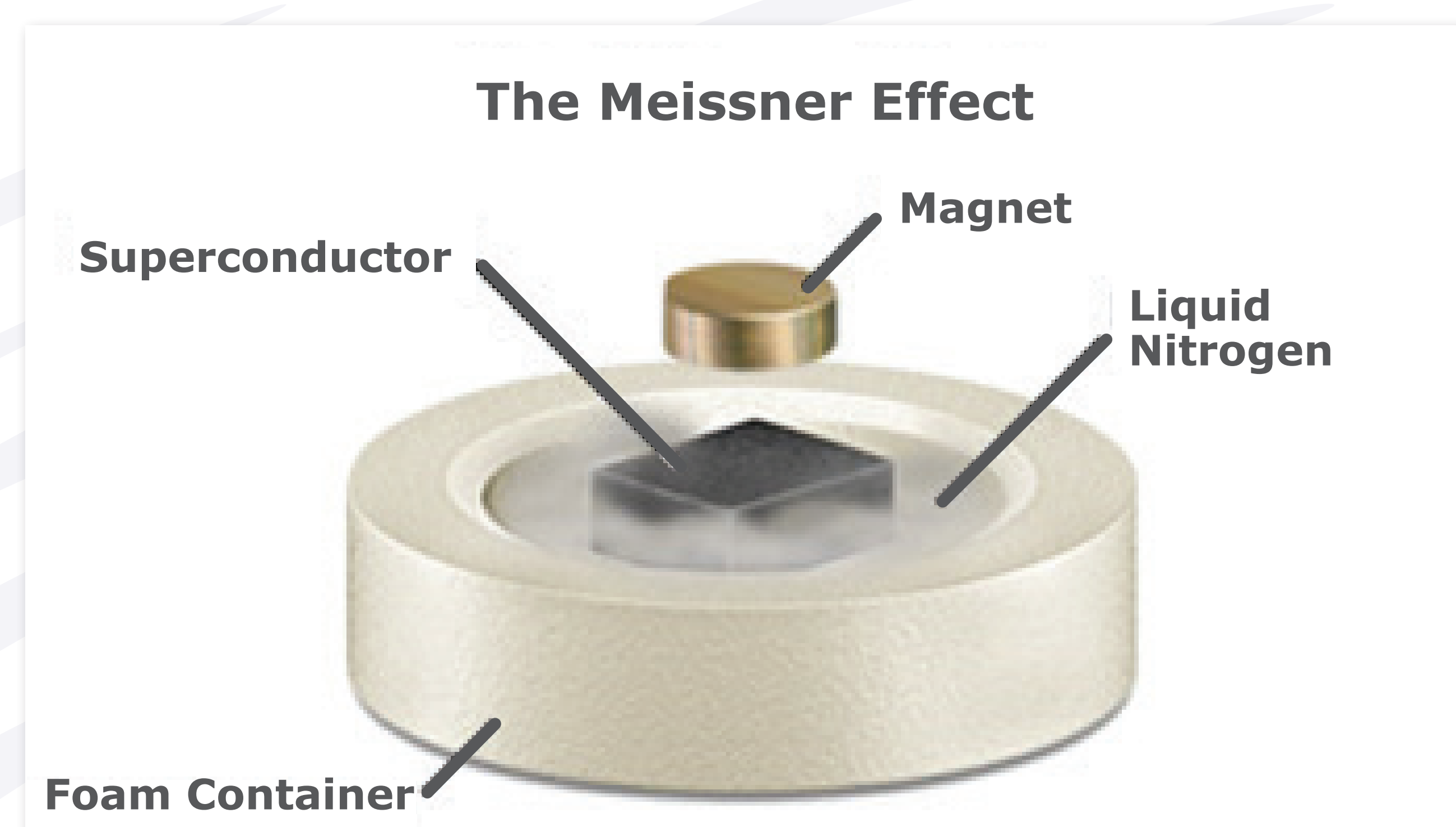


Figure 3: Meissner Effect

## EVALUATION

- ▶ Diamagnetic materials are easily obtained.
- ▶ Vacuum tube proved to be successful in Switzerland.
- ▶ Superconductor electromagnets was more effective compared to ordinary electromagnets.
- ▶ Composite materials as superconductor are available and cheap.
- ▶ Liquid N2 cheaper and easier to handle compared with helium gas.
- ▶ Best location to build the station is the airport.
- ▶ Data retrieved show that turning is safe.

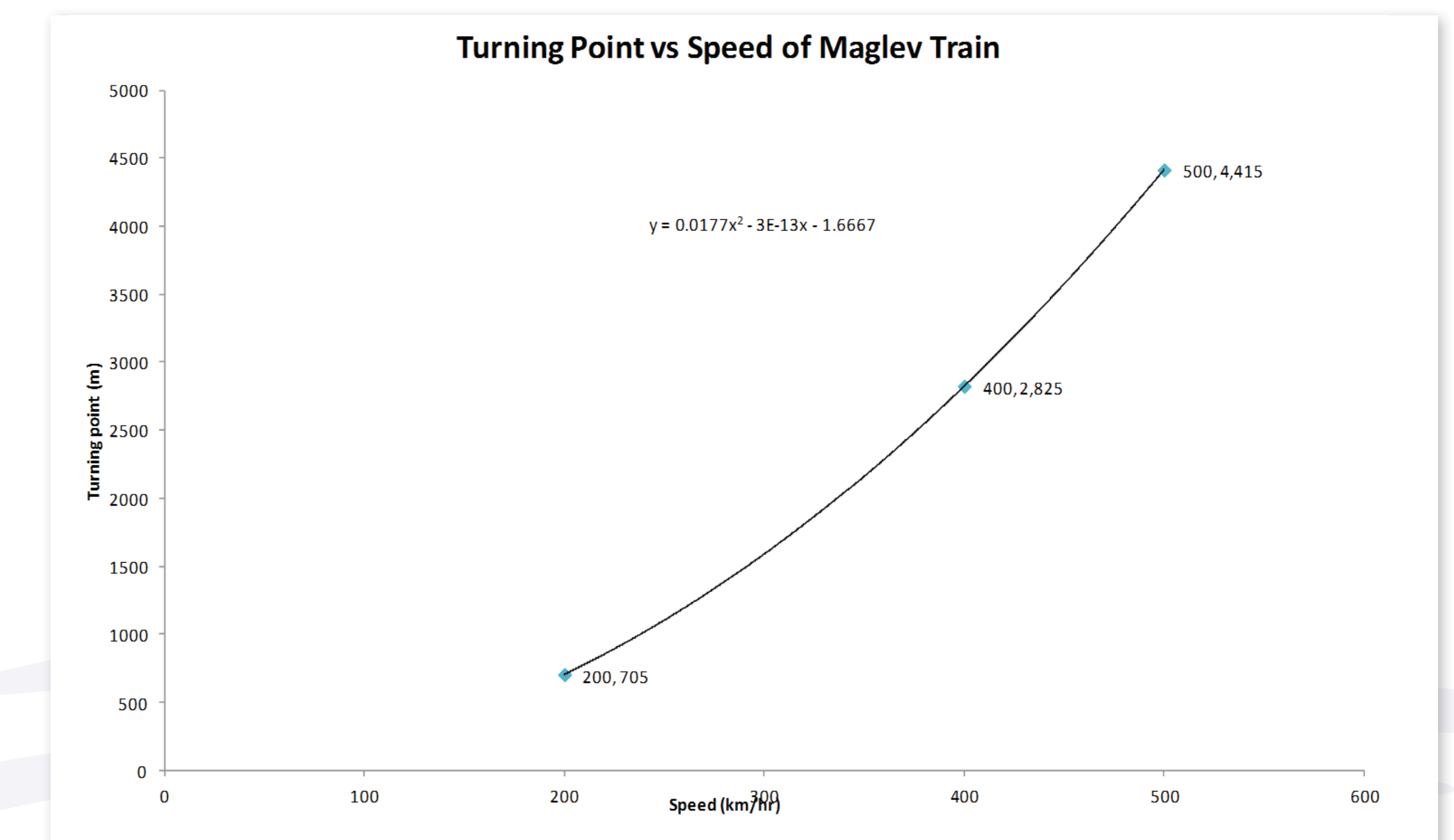


Figure 4: Turning point vs. speed

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