

# Connecting the GCC Countries with the Maglev Train

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## Situation

The GCC tourism rate is growing rapidly every year [1] however; the region is limited to air and vehicle travel making transportation costly. With Dubai winning the Expo 2020 bid and Qatar winning the World Cup 2022 bid, there will be a significant increase in growth. Due to this growth the current transportation system will not be able to handle the incoming influx of future travel demand.

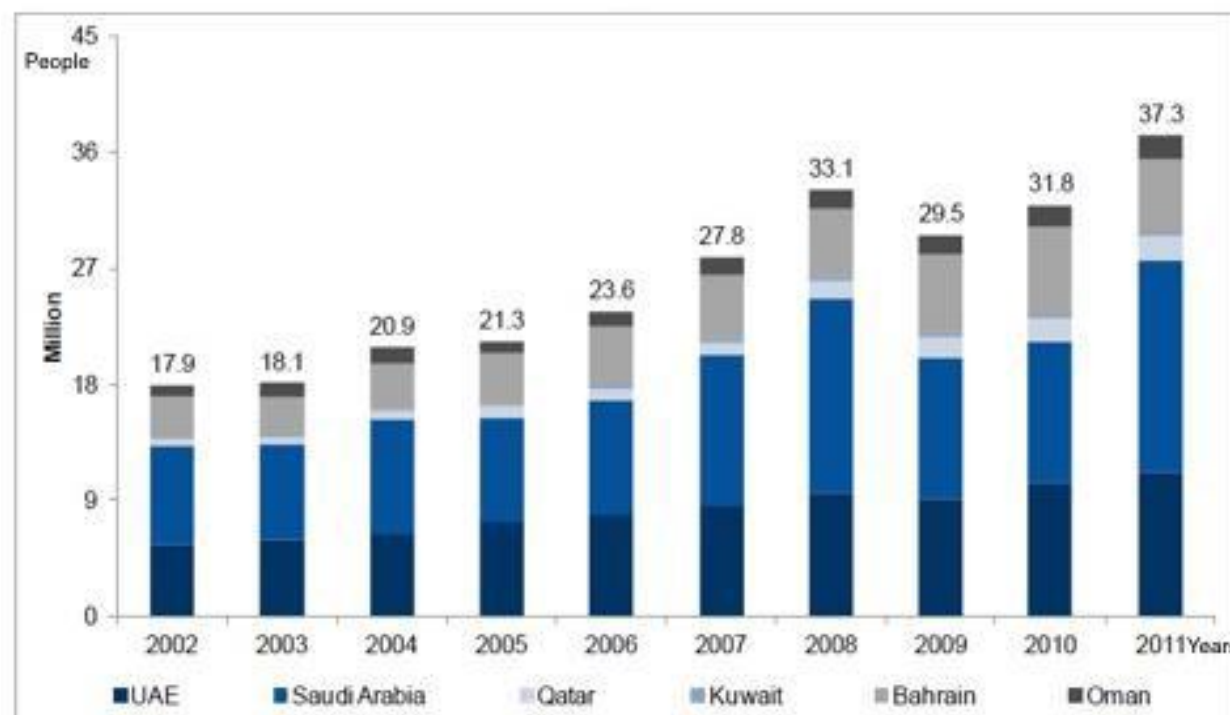


Figure 1: GCC Tourist Arrivals by Country [2]

## Problem

- Lack of quick and efficient means of transportation between the GCC
- Current travel modes are not environmentally friendly
- Air and vehicle travel have high cost and consume a lot of time which can affect the rate of development in the GCC

## Solution

In order to accommodate both the residents and the future visitors of the GCC region, we propose to implement the Maglev train. This train is capable of achieving high speeds, reducing travel time and making travel cost cheaper. Other attributes of the Maglev Train are:

- It requires no wheels, which will reduce the friction significantly
- Has low energy consumption

- Pricing of the ticket will be lower than an airplane ticket as well as the time, which will be saved if one were to travel by car
- There will be no transportation congestion and will reduce noise pollution

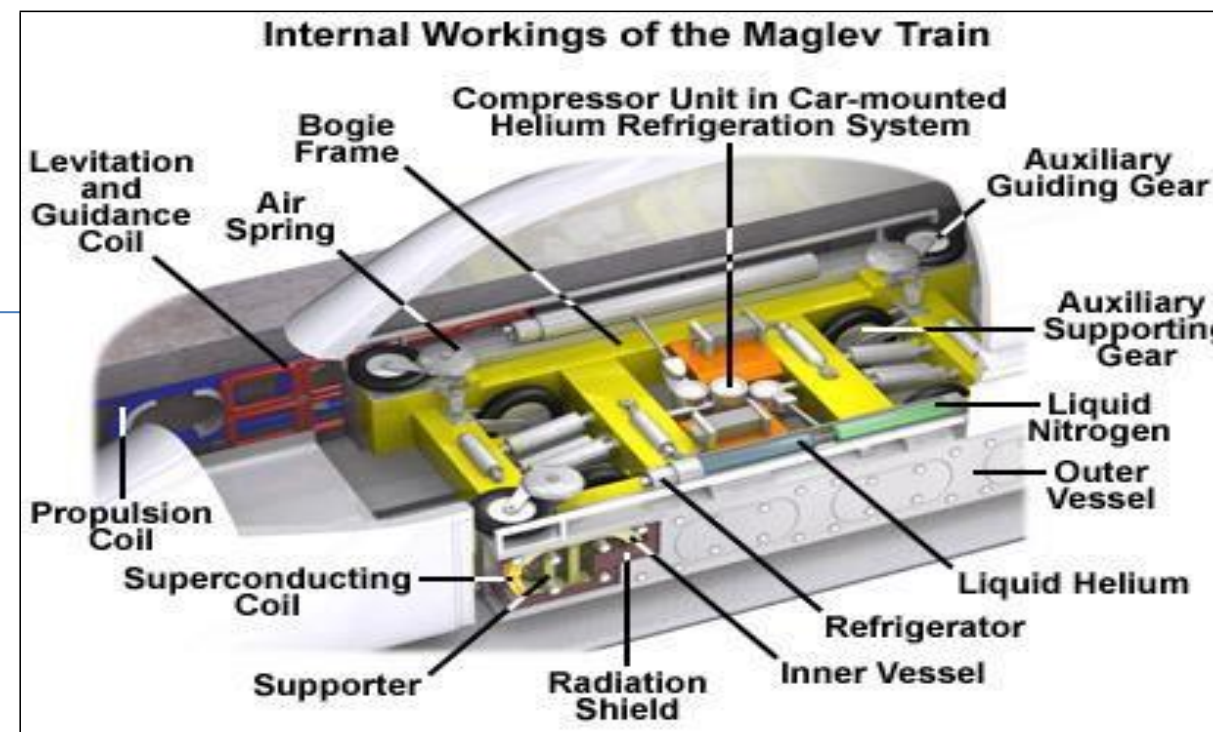


Figure 2: Internal Workings of the Maglev Train [3]

By supplying the current into superconductors, the train will create strong magnetic field allowing it to move forward [4]. The magnets at the side of the train have the same polarity, creating an attractive force while the magnets on the side of the train are of opposite polarity creating a repelling force.

To be able to have a better image of the alterations in the cost we calculated an approximation of the difference in both prices and time.

Table1: Approximate Comparison Between Various Modes of Travel

Dubai (UAE) - Doha(Qatar)	Travel Distance (Km)	Cost (AED)	Travel Time (Minutes)
Maglev Train	685	638	85
Airplane	480	1000	60
Vehicle	685	130	450

## Evaluation

When evaluating our project, we were required to look into both political concerns as well as engineering concerns.

The two main political concerns would be:

- Funding: Cost must be divided between all GCC countries
- Visa Restriction: The GCC countries must reach an agreement to create one visa, which can be used to enter all countries.



Figure 4: Possible Train Route Connecting the GCC

From an engineering standpoint, finding the most suitable route for travel, designing the railways to withstand high climate and natural disasters and perhaps increasing the speed of the train to increase efficiency are all points that must be evaluated. Placing a rubber bearing for example under the trains path will allow for minimal damage if an earthquake is to occur. Also having air conditioning systems under the train itself will allow for it to remain cool at all times.

## References

- [1] Mustafa, A , "Single visit visa for GCC's six nations as soon as 2014". Retrieved March , 2013 Available: <http://www.thenational.ae/news/uae-news/single-visit-visa-for-gccs-six-nations-as-soon-as-2014>
- [2] GCC Retail Industry , 'Alpen Capital' , December , 2012, p.1 – 1
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- [4] Y. Al Shetwi, "Current Applications of Superconductivity," Phys4030, June, 8, 2013. [Online]. Available: <http://2013phys4030.blogspot.ae>. [Accessed: April 8, 2014].
- [5] "Randolph's Introduction To Superconductors," 2011. [Online]. Available: <http://www.wou.edu/~rmiller09/superconductivity/>. [Accessed: April 8, 2014].