



## Business Concept Report

### Market

Our main market is NASA and our other market will be companies who go to the moon. Since NASA plans to have a lunar outpost by 2020, they will need a cheap and efficient way to get food, and materials to the lunar surface. Instead of sending a huge spacecraft to LLO and then returning it to Earth, our idea proposes that the food, water, and materials be sent directly to LLO by themselves. Plus, this would reduce weight on spacecrafts because instead of carrying all the food, water, and supplies they need for their lunar outpost in a spacecraft, the railgun could launch the crew food, water, and supplies whenever they need it.

Another market is private spaceflight and companies who want to go into space and moon exploration. If they put a spacecraft of theirs into LEO it could carry a railgun on it and launch small payloads to the moon or even Mars. They could launch their own technology to the moon and or help NASA by launching food to the lunar outpost.

### Value

The normal fuel NASA uses for TLI is LOX/LH2. This costs around 7.28 dollars/kilogram. And 228519.836 kg of the fuel is used to perform TLI for a 187.7 mT or 187700 kilogram payload. So 1.21747382 kg of fuel is used for every kilogram of spacecraft and payload. Therefore assuming we have a 500 pound payload or 226.796185 kilogram payload it would take 276.1184177 kilograms of fuel to perform TLI. The fuel for just the TLI would cost around



2,010 dollars; however because of the cost of launching this fuel with the space craft as it enters LEO, the actual costs of taking fuel into space are much higher.

## **Selling Points**

There are a few main selling points to our idea. Firstly, it saves fuel and uses a clean and renewable energy instead. Plus, everything from the payload sent to the moon can be recycled and used for other things in the lunar outpost. Additionally, it is a brand new way to use railguns and LEO provides great conditions to use it in. In LEO there is no gravity weighing down the object, and since there is no gravity, once the object starts to move and begins on its way to the moon, it will not stop. Lastly, it is a new and unique method of transporting food, water, and materials to the moon. It is reliable, reusable, and completely solar. The air bags on the payloads might even eliminate the need for rockets and fuel. And without a rocket and engine the payload would weigh significantly less.

## **Comparative Assessment**

Currently, NASA plans to return people to the moon by 2015. They will do this using an Ares I rocket and an Ares V rocket. In 2020 they plan to build or establish a lunar outpost. They have not yet come up with a way to transport food, water, and materials there efficiently without sending huge payloads atop rockets which will need to make soft landings using rocket boosters to touch down. Our idea using a railgun would allow food, materials, and water to be transported to the moon quickly, efficiently, and without any risk of human life.



An additional user of this technology could be competitors in the Google Lunar Xprize. Currently contestants will have to use a government sponsored launch vehicle to get to their rovers to the moon, however if railguns are used on a private spacecraft the launch to the moon will be completely in private industry. This would open the door for private companies to start to invest in moon exploration.

This idea could also be used by space tourism companies. If they are doing a tour in LEO then they could at the same time as their tour they could launch a payload on its way to the moon.

### **Exit Strategy**

If NASA would want to buy and use our idea we would probably sell it to them. If spaceflight became normal and commercial we would probably sell our idea to a company who either has a lunar outpost, or is looking into exploring the moon.