



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Aaron E. Parker</b>   | <b>Project Number</b><br><b>S0323</b> |
| <b>Project Title</b><br><b>Hyperloop Beta: A New Method of Transportation</b>  |                                       |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>My project was to prove which method could propel a cart the fastest through a levitational tube. It was also to prove if the hyperloop could be built. I believe that the hyperloop can be built, and that the vacuum or suction of air will propel a capsule fastest through a levitational tube.<br><b>Methods/Materials</b><br>90 degree angle plastic visible corner guard, magnetic strips (double polarity, one side lengthwise south opposite side north), miniature plastic hollow box, tiny magnetic strips, clear tape, tape measure, plastic cutter, Plastic support blocks, gliders, small funnel, balloon , 20V Vacuum, stopwatch, DC motor, battery, coil, nail, labeling tape.<br>The project's intent was to build the tube and capsule, test for levitation and run a pretest to find out which method of propelling the capsule would work best. Pretest was run using magnets, electromagnets and air.<br>First, I figured out which propelling method propelled the cart fastest. Then, I tested 3 different ways of using the air method to propel capsule in the most optimal way: Balloon. vacuum and fan.<br><b>Results</b><br>The suction of air propelled the cart the fastest through a levitational tube. The vacuum system achieved the fastest rate of speed and fastest time to travel the distance of the tube. The pressurized balloon of air came in close behind. The fan had the slowest rate of speed. Therefore, the vacuum is the fastest method to propel a capsule through a levitational tube.<br><b>Conclusions/Discussion</b><br>The Hyperloop is a theoretic, idealistic, yet planned high-speed American technologically based transport. It is currently being viewed for development by a series of companies. This system involves the use of pressurized capsules riding on a cushion of air in reduced- pressure tubes propelled by air compressors and linear induction motors. The idea was originally put forth by entrepreneur Elon Musk, calling it the 5th mode of transportation.<br>My project was to prove if Elon's idea could come to fruition. I proved my hypothesis correct. The hyperloop can be built and a vacuum/suction of air does propel a capsule throughout a levitational tube the fastest. Therefore, Musk's idea is possible and utilizing air as a method of propulsion for the Hyperloop would be a success. |                                       |
| <b>Summary Statement</b><br>I built a levitating transport system (capsule and tube) and successfully demonstrated that air propulsion is the most effective method to propel this new transport system.   |                                       |
| <b>Help Received</b><br>I designed and build the levitating capsule and track by myself. My parents, both electrical engineers, assisted me in understanding the dynamics of levitating systems.   |                                       |