Proposal Title: SkyTran at Rutgers

Total number of pages (not counting cover pages): 6

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200 word (maximum) summary of the proposal or video:

This proposal is to help Rutgers find a way to reduce its transportation fuel use and costs on campus. The bus system will soon become outdated as new technologies, including the one I am suggesting here, arise.

Our bus system is very energy intensive, pollutes the air, costs the university millions of dollars every year, and exacerbates traffic in the city. It is also an inconvenience for students. Bus travel is time consuming and socially uncomfortable.

I propose we build a SkyTran demonstration project on campus to try a new technology that might alleviate all of these problems and lead us into the future. skyTran is a NASA patented personal rapid transportation system that has the potential to save us millions of dollars, dramatically reduce our carbon footprint, save students time, and make the Rutgers experience overall more positive.

Relying on the Rutgers bus system is one of the least rewarding and most frustrating parts of campus culture. Most students are obligated to travel from campus to campus here in New Brunswick or from distant areas of campus in Newark and Camden for classes, jobs, extracurricular activities, studying groups, and dining halls on a daily basis. They check the schedule on their phone, run to the stops to try to make the bus before it leaves, and wait for the next bus if they miss the first one. Sometimes, especially in the evening, there are so many students on the bus that people who have been waiting for a while at the stop cannot even find room to squeeze into. According to the Qualitative Research to Assess Interest in Public Transportation for Work Commute study done by the University of Regensburg, the public prefers transportation systems that are flexible, quick, and affordable (Carr).

I called John Karakoglou, Manager of Transit Services at the Rutgers DOT. He gave me a brief summary of the annual fuel usage and costs of the Rutgers New Brunswick bus system. On average, the buses travel a total of a million miles per year, and the buses go 3 to 7 miles per gallon, so we use 142,857 to 333,333 gallons of fossil fuel and biofuel annually. Each bus costs $380,000, and we have about 65 in use here in the city, so the total operating costs is $24,700,000 every single year (John). There is no carbon tax or cap-and-trade system for Rutgers, so the full cost of the system, which would include the cost of greenhouse gas emissions being emitted by our tailpipes, is not factored in. Maybe in the near future it will have to be considered, and the system will be even more costly then.

skyTran, on the other hand, is a physically and economically viable alternative to the bus system. It is a personal rapid transportation system that was first proposed in 1990 by inventor and aerospace engineer Douglas Malewicki of Unimodal Incorporated. It was granted a patent in 1992. The idea had come about when Malewicki had designed a lightweight car that averaged 154 miles per gallon, but could never be implemented with all of the older, heavier cars on the road for safety reasons. So he sought out a solution that would allow him to go around this problem. Later he conceived that it was not around but above that he needed to be looking to make this idea applicable to our lives. He could build his lightweight car on elevated passive magnetic levitation tracks above the ground that could go up to 200 miles per gallon without any interference of other vehicles!

I know that a light rail for Rutgers has been proposed for this contest in the past. skyTran is not a lightrail. The US National Transit Database has estimated that lightrail projects have cost up to $100 million per mile, but skyTran CEO claims that this system only costs $10 million per mile, because the car pods would be significantly lighter than a rail would be. The route from Cook/Douglass to College Ave through George Street is about one mile. This is called the “EE bus,” and it brings students on one of the nine main routes on this Rutgers campus. If we estimate that every route is 1.5 miles long, then we would need SkyTran for 13.5 miles, which could cost us upfront $135 million. I was not able to find out on average how much it costs to shuttle a student per ride, but skyTran’s cost per rider is cheaper than a taxi would cost. $135 million is a lot of money, but we also spent $24 million solely on the new Livingston campus dining hall to attract potential new students. If we had skyTran, the investment would absolutely impress visitors, as it could revolutionize our transit as we know it today. Additionally, only a fraction of the 40,000 students here at New Brunswick use the dining hall on a regular basis.

Commuters, those with their own kitchens, and students living and taking classes on other campuses rarely if ever use Livingston dining hall. I live and take all of my classes on Cook/Douglass, and I have only eaten at Livingston twice so far. I am now in my second semester at Rutgers. skyTran could be used by the majority of students who spend their time across different campuses or who need a ride to downtown New Brunswick.

Rutgers Bus System	**Rutgers skyTran System**
Run on fossil fuel and biodiesel	Run on solar power generated on-site
Costs $24.7 million every year	Upfront cost of $135 million
Often late and overcrowded	Immediate pick-ups, no stops
Uncomfortable to sit with many strangers	Pods hold two at time, fewer strangers to sit w/
Non-Rutgers students are able to use it	Only Rutgers students can order ride with ID
Contributes to city's air pollution	Zero-emissions = zero air pollution
Contributes to city's noise pollution	Silent
Pedestrians at risk of getting hit by bus	In air, far away from pedestrians on ground

skyTran has been designed for the average adult commuter living and working within an urban, metropolitan, and/or suburban setting. Douglas understood that most commuters travel alone to work and do not really need room for four or more people in the vehicle. So he designed the cars as lightweight pods that could fit two people at a time. If this is a problem for groups travelling with more than two people, the pods can be linked together to bring more passengers along the same route. People can order a ride on an app on their smart phone and swipe their ID card into the machine in a similar way that students swipe in to get access to a dining hall. If this

system worked out for Rutgers students, maybe it could be accessible to residents and professionals of the rest of New Brunswick.

skyTran has the potential to travel at 100 miles per hour. The grid system that all pods are connected to is computerized, so human error during driving no longer has to threaten our communities. The pods would travel in a linear model so there would be few moving parts. The tracks can be supported between 20 to 30 miles above ground by metal poles, which only need low-skilled workers to set up. Since the cars (which the website claims are cheap to mass produce) are not actually on the road, but in the air, roads no longer need to be built. We could thus reduce our reliance on fossil fuel, as asphalt is derived from petrochemicals. But perhaps most importantly, the cars themselves would not have to be powered on oil or gas. Solar panels sitting on top of the tracks, polls, and pods would produce enough energy to move the pods where they were directed to go. Its website noted, "The power used in two hair dryers can fly you at over 62 mph with skyTran. The legacy of polluting combustible engines can be reduced significantly by installing a clean and green skyTran system." This would allow us to have a fast, safe, zero emission, no road transportation system at a feasible price.

Both the students and the university would benefit. "Because your vehicle enters and exits a continuously flowing stream of other skyTran pods, you never have to stop for others who wish to embark or disembark from the steam. As you head directly to your destination, there are no in-between stops with skyTran" (skyTran). The city would benefit too; skyTran can enclose power and communication lines within its track, making the lines invisible and thus more aesthetically pleasing.

The speed at which the system can be maintained is also astronomical. "Repair of the skyTran system is faster and cheaper than any other mode of mass transportation. Damaged

portions of track are relatively easy to install quickly and cheaply. Because the system does not require high tolerances, a team of workers can drive up, bolt together new components, and have the system up-and-running very quickly" (skyTran). We cannot say the same for our buses, cars, trains, and planes.

The skyTran corporation itself has also recently become a patented NASA Space Act company headquarter in Mountainview, California. At first Douglas proposed that skyTran should have an Indutrack passive elevated system, which was too costly and difficult to build. But since then, NASA has been working with him and Unimodal Inc., and have found a way to improve the design to make it run smoother and cost less. NASA's expertise and power has been pivotal to the making of this once far-fetched project. In June of 2014, NASA and Unimodal teamed up with Israel Aerospace Industries to build the first ever demonstration system on their corporate campus in the city of Tel Aviv. If skyTran is successful in this controlled environment, Tel Aviv will build the first commercial system for its citizens. If that also goes well, the system will be expanded to all of central Israel. The cities Paris and Roissy in France and several Indian states are also looking to start skyTran projects after the demonstration validates it (skyTran).

Bus drivers would lose their jobs if this was built, since their services would no longer be needed. But paying the expensive upfront cost might save us millions of dollars in the long run, and we would be so much closer to our goal of going carbon neutral by 2030. As the population continues to grow, this technology could eliminate our well-known traffic problems, which are especially bad in New Jersey. "Because skyTran is built as an expandable grid, it will never be filled to capacity. As the demand grows, more track can be installed and additional vehicles can be added the network. The robust state-of the-art skyTran system grows in the same way that the

Internet grows: exponentially and immediately. In fact, you can think of skyTran as a "Physical Internet" (skyTran).

With all things considered, skyTran is worth looking into for its environmental, economical, temporal, and safety benefits. Thank you for your time and I hope you like the idea.

Works Cited

Carr, Kerstin. "Qualitative Research to Assess Interest in Public Transportation for Work Commute." *University of Regensburg*. Journal of Public Transportation, Vol. 11, No. 1, 2008.

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skyTran website. http://www.skytran.us/