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Trans-Collegiate Railway

PROJECT PROPOSAL FOR A CSULB MONORAIL

Prepared for California State University, Long Beach

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Summary

The Trans-Collegiate Railway will be a high-speed monorail developed by Avila RailCorp which could provide rapid transportation on the campus of California State University, Long Beach. The projects primary aim is to immediately replace the outdated on-campus shuttle system and once completed, to slowly begin replacing the off-campus shuttle system through a series of extensions. The monorail system will have stations in student dense locations from each of the university colleges (hence the name, Trans-Collegiate Railway) upon completion. Construction of the both the railway and the tram will be done off campus; assemblage will occur on campus. Assemblage should not take any more than three months, making summer session an ideal time to undergo the process. Management of the Trans-Collegiate Railway will go to the university administration; involvement by Associated Students Incorporated is expected to be minor. Avila RailCorp will closely collaborate with the university after project completion to ensure safety and functional standards, and for discussions on potential developments. Financing for the monorail will largely come from university funds, the city of Long Beach, alumni donations, and a long list of sponsors.

Avila RailCorp

Avila RailCorp has a well-earned reputation as the leading contractor for building rail transport systems in the United States. Most iconic public monorails in the country were produced by Avila RailCorp, such as the Memphis Monorail or the high speed Trans-Californian Railway. Their projects have all been successful in every meaningful way to their clients:

- Minimal ecological disturbance
- On time completion
- Safe operation and construction
- Reasonable costs
- Passenger satisfaction.

Figure 1. The Memphis Monorail built by Avila RailCorp in 2011. The Memphis Pyramid stands out in the background.

The company was listed as one of the most ethical companies by both Forbes and the Ethisphere Institute, highlighting the company's admirable business practices, environmental record, and employee treatment. It should also be noted that Avila RailCorp is headquartered in Long Beach, CA.

Current Situation

The CSULB shuttle system that presents the only means of campus transportation to students other than walking is inefficient and largely unutilized. A poll recently conducted by ASI revealed that the majority of students (62%) have never used the shuttle. 32% of students have used it and report being dissatisfied, the most common reasons being that it is too crowded or walking to their destination is faster. Only a mere 6% of students use the shuttle and are satisfied by the service. These statistics alone show that the shuttles are inefficient, and even inconvenient. It is unacceptable that students find the shuttles too crowded given the fact that the majority of students are not even using it. Some might say we can revamp the shuttle system, but it is the *mode of transportation* that is flawed, which will be elaborated on later. First, let us look at the budget.

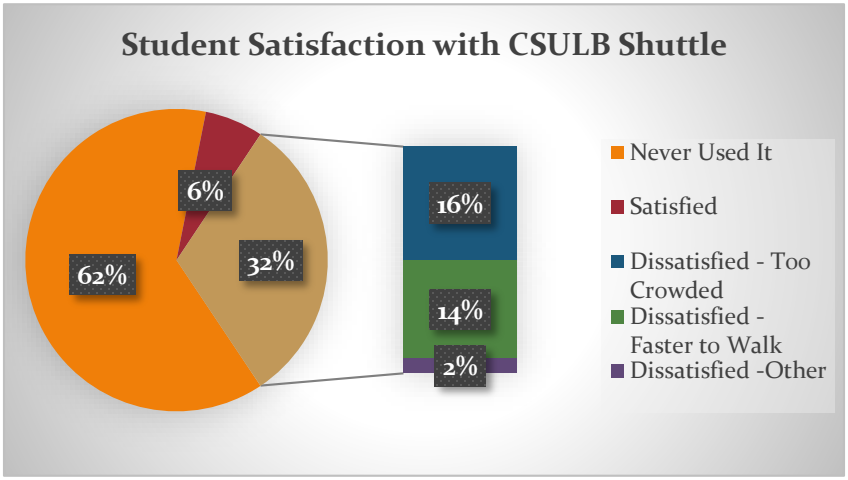

Figure 2. Poll was conducted by ASI in Fall 2015 through e-mail. 31,004 students took part out of a total of 37,446 (83% of student body).

Cost

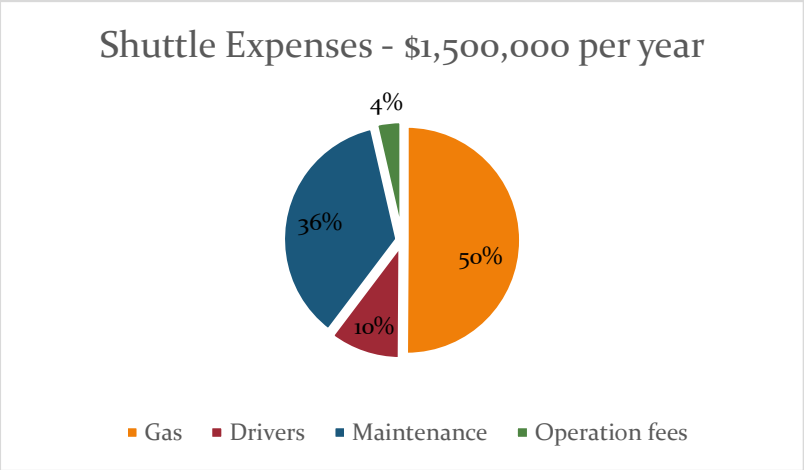

Figure 3. The cost of gas and shuttle maintenance is tremendous.

The CSULB shuttle system costs the university 1.5 million dollars annually to keep operational. By comparison, the library costs around $850,000, and the Horn Center $620,000. The CSULB shuttles cost the university more than the library and Horn Center combined. Half of those 1.5 million dollars ($750,000) go into gas and over a third ($540,000) into maintenance, already accounting for over a million dollars. The remaining funds go to paying the drivers and operation fees (DMV registrations, taxes, etc.). The costs of the shuttle system are absurd considering how little it is utilized. The financial drain of the shuttles will only increase as gas prices and fees rise.

Transportation Limits

Arguably the biggest hindrance to the shuttle system as a viable means of transportation is that it can only travel on the roadway. This severely limits the shuttles from accessing population dense areas of campus, and delivering nearby desired destinations (see Figure 8). For example, the nearest stop for the business building is one near the Brotman Hall fountain.

Figure 4. A shuttle on Palos Verdes Ave, near the Design building.

Frequent and Slow Stops

The shuttle stops frequently to pick up and drop off students, which is not a bad thing in itself, but when coupled with its transportation limits it becomes a burden. It can take the shuttle a few minutes to get back on the move after stopping, and when it also delivers students quite far from their destination, it ultimately makes riding the shuttle more time consuming than walking. Getting from the Student Recreation & Wellness Center to the library will take four stops and a few minutes of walking. Unless they are tired, students are better off walking.

Small Capacity

The shuttles have a max capacity of 30, which is not a lot. During "prime time" (9 a.m. to 12 p.m.) the shuttles are often full, which is problematic since those times are when they would be most useful. It is common for students to wait for the shuttle, only to be disappointed when they cannot be let in because it is full. Oftentimes, the driver will be generous and allow more than the official capacity, which raises another issue.

Dangers

The shuttles have been safe thus far, but accidents have occurred. They are highly prone to human error. In 2014 a young girl skateboarding was hit by the shuttle; fortunately there were no injuries and no scandal was raised. There are many things that can go wrong, worsened by that fact drivers allow more students than advised in. An accident on the road while overfilled is a catastrophe waiting to happen.

Old and Dirty

The shuttles are old, get poor mileage and are not eco-friendly. Replacing the shuttle system with something more sustainable will not only improve our finances, but our image as well.

The Monorail

A monorail will solve most of the problems and shortcomings in campus transport caused by the shuttle system. A monorail will drastically improve our transportation and boost the university's prestige.

The fundamental flaw with the shuttle systems transportation is that it is a motor vehicle attempting to transport students in a large campus by only traveling on its perimeters. A monorail does not share that limitation as it is elevated.

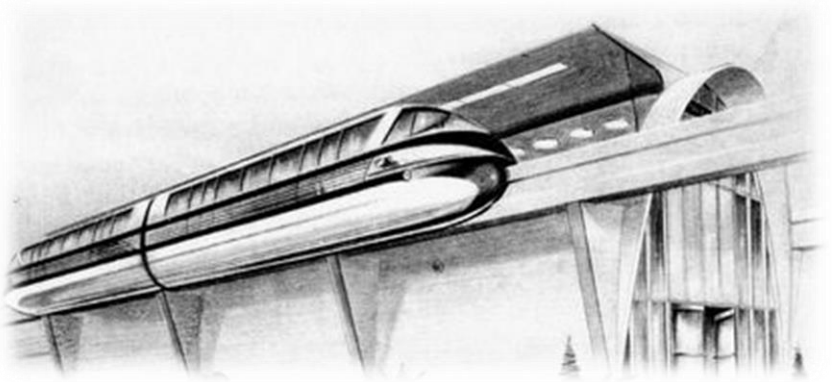

Figure 5. A rough sketch of a possible location for a monorail pathway and platform by the Student Recreation & Wellness Center.

The Proposal

The proposed monorail will be a luxury straddle-beam Maglev train, allowing for high speed capabilities. Internally it will contain luxury amenities such as HD television and leather seating. It will have 10 stops at population dense areas. It will increase the interconnectedness of CSULB, as some locations like the Carpenter Center and Music Center are too isolated from the rest of the university. It will consist of two trams, and will be built by Avila RailCorp at Long Beach Industrial. Once negotiations are complete, construction of the monorail should take approximately seven months. The assembling of the monorail, which will occur on campus, is expected to last between two to three months. If the assembling takes place during summer session, disturbances will be minimal and the monorail will be fully operational the following fall. Once completed, there will be possibilities to expand it to other areas convenient to CSULB students. The monorail will be managed by the university, and the extent of ASI involvement lies upon the university administration.

Name: Trans-Collegiate Railway

Manufacturer: Avila RailCorp

Built at: Long Beach Industrial

Owner: California State University, Long Beach

Capacity: 20 seats per car; 75 standing per car

Train Length: 99 ft

Car Length: 48 ft

Width: 11 ft

Height: 15 ft

Max Speed: 93 mph

Type: Rapid Transit

Weight: 15 tonnes per car

Stations: 10

Figure 6. Specifications of the Trans-Collegiate Railway.

	Trans-Collegiate Railway	CSULB Shuttle
Energy	Will run on electricity. Possibility of solar power upgrades.	Runs on gasoline, which has proven costly.
Capacity	20 seats per car, with 75 people capacity (per tram). Total of 40 seats with capacity of 150.	Officially at 30, but dangerously allowed over-capacity.
Pathways	Anywhere desired, so long as vertically space allows.	Only on roadways.
Speed	93 mph (max); 20 mph likely on campus. Avoids traffic.	10 mph on campus; 40 mph outside. Affected by traffic.
Safety	Monorails are noted for being among the safest forms of transport.	Can be dangerous; accident prone.
Appeal	Likable. Modern.	Outdated. Boring.
Maintenance	Little to none.	Often and expensive.

Figure 7. Comparisons between the Trans-Collegiate Railway and the CSULB Shuttle favor the monorail.

Other Benefits

The monorail will bring much more to the university than just an improved transportation system. When the Walter Pyramid was completed, a reported increase in tourism of 150% was noted. The building of the Trans-Collegiate Railway has the potential to boost tourism once more. Other benefits are:

- The monorail will serve as a useful recruiting tool, increasing the amount of students that want to attend CSULB. In turn, CSULB has a bigger pool of students to choose from, and the ability to be selective in who it enrolls.
- The possibility of expanding opens up many opportunities. Beachside can be better integrated, and expanding into areas off campus where a lot of students reside can make CSULB feel like less of a commuter school.
- Expansion to off campus areas where many students reside can solve parking issues.
- A monorail on campus is, to put it simply, cool. It is something students are already getting excited about, and will definitely love (unlike the shuttles).
- The monorail can pay for itself and eventually even generate profits. Non-student charges can be employed and there are already a growing list of sponsors.

Figure 8. Map of CSULB with likely locations for monorail stations and current shuttle stops.

Financing

Financing for the project is looking to turn out much easier than anticipated. Various sources of funds are available for the development of the project.

Sponsors: There are many prominent individuals who have publicly voiced their support for the project and are willing to open their checkbooks to sponsor it, most notably CSULB alumni Steven Spielberg. Spielberg is willing to give 6 million dollars, and another 2 million dollars can be accrued from other potential sponsors (a list that is still growing). This leaves us with at least 8 million dollars from sponsorships alone.

City of Long Beach: The city is interested in assisting with the project, and has pledged 4 million dollars. Mayor Garcia has shown his excitement in seeing the project come to fruition.

CSULB Alumni Association: The CSULB Alumni Association has managed to collect 2 million dollars for the project.

CSULB: The university can obviously provide some sort of funding for the project. Assume that the 1.5 million in funds for the shuttle system will be reallocated to the project.

Avila RailCorp has provided an estimate of the project, along with the annual costs for operation. Total costs for the project are expected to be between 9 and 10 million dollars. Annual operation expenses are estimated to be around 1 million dollars (less than the CSULB Shuttle). Taking into account the amount of funding that is expected, it becomes obvious that the project is worth the investment. It is possible that sponsorships alone pay for the entirety of the project, leaving CSULB leeway with expenses. Money can be spent for more luxury items, another tram, or the off-campus expansions. All of this is not yet taking into account the profitability of the monorail.

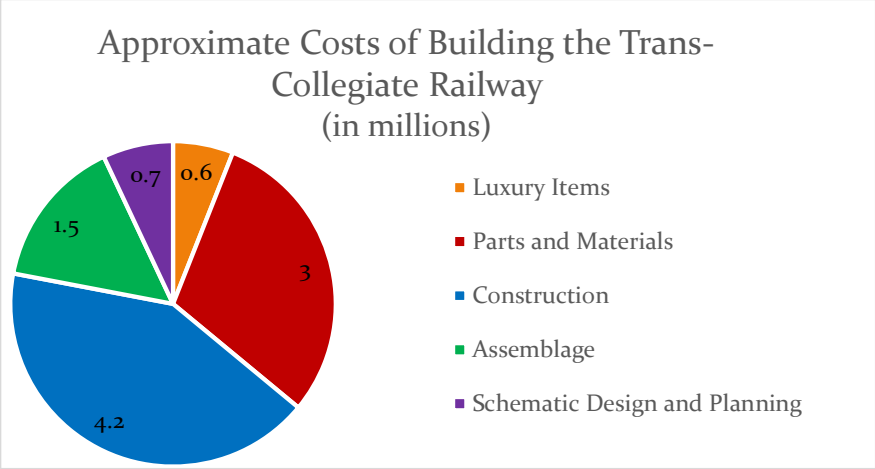

Figure 9. Source: Avila RailCorp

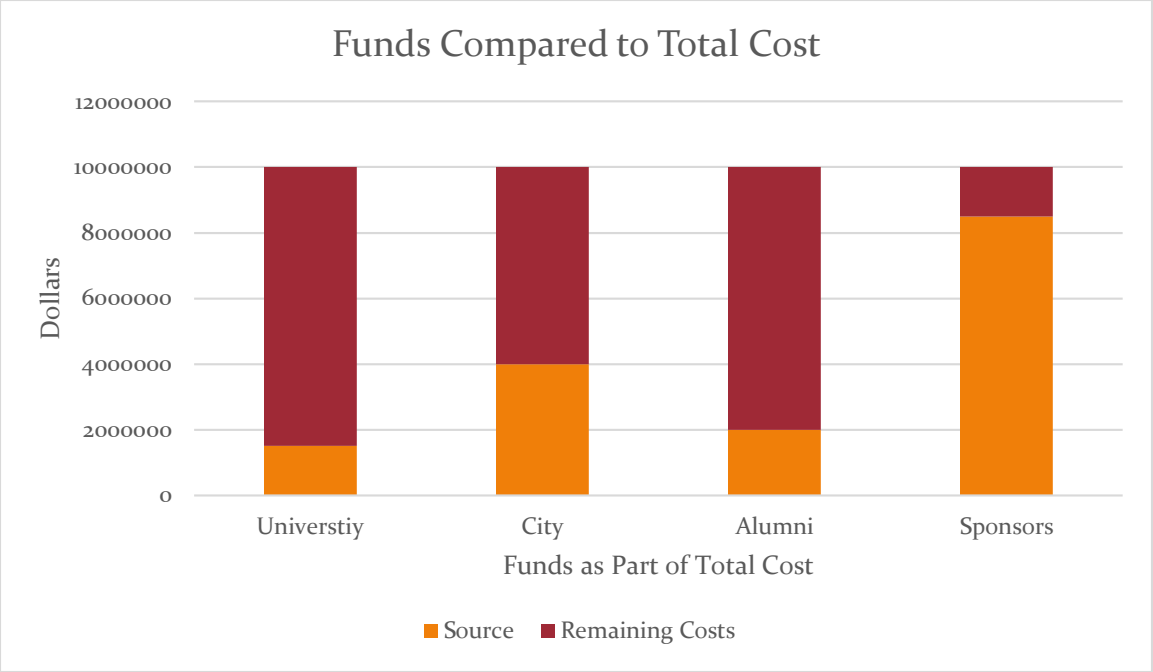

Figure 10. Sponsors alone nearly cover the entire bill for the project.

Profit Value

Advertisements in the monorail and tourism will make the monorail profitable. However, the big money lies in expanding the monorail outside of campus. Expanding the monorail off campus opens up two major options for the university.

1. Avila RailCorp is offering to build the expansion and pay for it themselves, with the condition that they receive money through charges made to non-students who ride it. This makes the entire process free for the university. It will require negotiations between the university, Avila RailCorp, and the city of Long Beach. NOTE: If this option is chosen, Avila RailCorp may be convinced to pay a share in annual maintenance, as they will have a vested interest that the monorail functions.
2. The university can pay for expanding the monorail off campus and profit from charges to non-students. It is currently unknown how much it will cost to branch out into the city, but it will be a lot more expensive than the initial project. Take into account that there is a surplus of funding for the initial project that can be committed to expanding.

How much money can be made by charging non-students is not easy to calculate. Every monorail built by Avila RailCorp has been profitable (the Trans-California Railway paid for itself in a matter of months) but consider that not everyone riding the Trans-Collegiate Railway will be paying (students will get in for free). The university has options, both of which are amazing deals.

Risks and Possible Issues

There are new difficulties that may be faced, as a monorail is entirely different from the current shuttles in place. The risks and issues posed by this monorail can be divided into three categories: safety concerns, issues arising during its assembling, and issues arising once it's operational.

Safety

Monorails are some of the safest forms of transportation in the world. A collision with another vehicle, structure, pedestrian, apparatus, or anything not supposed to be in its path is virtually impossible. The Trans-Collegiate Railway will be self-propelled with on board power generation, excluding the need for any external electrical wiring. Internally, there is nothing that poses any kind of hazard to passengers. Monorails have a near 100% safety record. One would have to try, and really hard too, to get injured by a monorail.

Assembling

Certain issues may arise during the assembling done on campus. In the off chance that the monorail is not completed by its deadline, it can become a nuisance during a busy fall or spring semester. Since stations will be built in population dense areas, the issue may be amplified. This can best be avoided by immediately beginning the assembling in the summer. Note that students in that summer session will have to experience the disturbances. Also, limits will probably have to be imposed on those who drive around campus in golf carts for safety reasons.

Operation

Perhaps the biggest issue with the monorail is that unlike the shuttles, if the monorail experiences a shutdown the entire system comes to a halt. If a shuttle experiences failure it can quickly be replaced by one of the backups or another operating shuttle can branch out of its path. A monorail failure, while extremely rare, will render the transportation system completely useless until it is repaired. Many students who are dependent on it, especially those who rely on it to get to campus from nearby, will be affected dramatically. The elevated status of the monorail will also affect the appearance of the campus. Ecosystems may be adversely affected, particularly those involving squirrels.

Future and Expansion

A monorail has many options when it comes to upgrades. It can be easily expanded by adding railway to create new paths. Trams can be added to the rear. The high speed capabilities of the Trans-Collegiate Railway can be utilized when traveling on and off campus, as more distance is being crossed. It is even possible to add parallel rails going in the opposite direction for another train to go the other way (this blurs whether the Trans-Collegiate Railway is a true monorail, but who cares about semantics).

1. Expanding the monorail off campus is perhaps the first upgrade that should be looked into. Many students that live in Beachside or near the "circle" rely on the shuttle to arrive to campus, and those that don't take the shuttle usually just drive to school which in turn contributes to the parking congestions. Once the off-campus shuttles are replaced by the monorail, the shuttle system at CSULB can be fully discontinued. It also presents the biggest opportunity for profiting from the monorail. The sooner the monorail is expanded, the quicker money can be made.

Figure 11. The monorail will be expanded to locations near campus that have a high a population of CSULB students. It will also serve as convenient way for the general public to travel in this section of Long Beach. Red Targets are locations of monorails stations; orange line is current off-campus shuttle path.

2. If the monorail becomes crowded the way the shuttles have, trams can be easily added. It can be done the same way it was when the monorail was initially made: the construction occurs off campus, and it is assembled/connected on campus. Unique trams may be added, such as one dedicated to naps, or one used as a study spot.
3. When traveling between campus to the "circle" or Beachside, the distance is large so the high speed capabilities of the monorail will come in handy. Go from CSULB to Beachside in a matter of seconds!