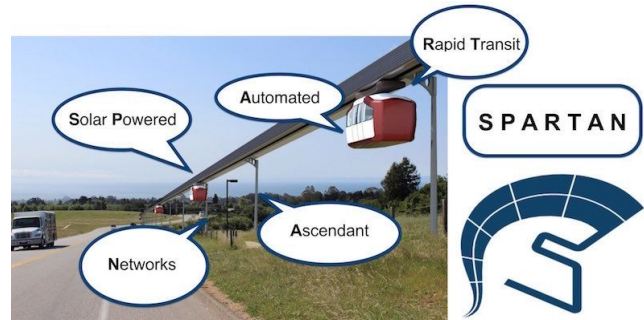


Solar **P**owered **A**utomated **R**apid **T**ransit **A**scendant **N**etworks
Burford Furman (SJSU), Ron Swenson (INIST)
14 October 2019

Professor Burford Furman (Mechanical Engineering) and sponsor Ron Swenson (International Institute of Sustainable Transportation), with the support of Deans Sheryl Ehrman and Walt Jacobs in multidisciplinary collaboration, propose a disruptive game changer for San José State and Silicon Valley, creating carbon-free, collision-free urban transit for the global market.

“SPARTAN” takes on a new meaning as Solar Powered Automated Rapid Transit Ascendant Networks. The Spartan Superway vision for public transportation features a network of grade-separated, elevated, solar-canopied guideways. Suspended, captive autonomous vehicles travel non-stop from origin to destination, bypassing off-line stations — cutting travel times, transit costs, and greenhouse gas emissions, while dramatically improving public health and safety.



What’s at stake?

The public discourse concerning human impacts upon essential ecosystem services (“Mother Nature”) has suddenly transformed from rhetoric around **Climate Change** into action to extinguish a **Climate Emergency**. Still nascent, this new understanding of our existential plight has led numerous public agencies to declare a climate emergency within their respective jurisdictions. So we are now asking ourselves, what is the University’s response to be? Are we facing the crisis for what it is and acting accordingly, even if it means disruptive changes to our way of life? Are we doing our very best to prepare our youth for a world that portends to be disruptively different from the one we have taken for granted over our own lifetimes?

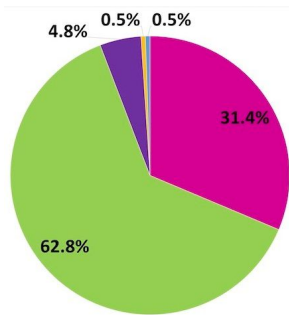
San José State can be one of the first universities to explicitly prepare its students for the *Climate Emergency*. This has far-reaching implications for leadership on all fronts.



Just as the brave protest of Tommie Smith and John Carlos at the 1968 Olympics was a watershed moment for civil rights, so Greta Thunberg’s school strike for the climate has galvanized millions to rally for real climate action, to treat it like the emergency that it is.

1968 ↔ 50 years ↔ 2018





Source: Climate Smart San Jose

San José's largest carbon emissions are from mobile sources — over 60%. Changing to electric cars might help but that doesn't address traffic congestion or safety, nor does it consider the source of electricity, still substantially from fossil fuels. We need a radical shift. With most of our emissions coming from transportation, and gasoline-powered vehicles still being sold in our community, we need more than rhetoric and gradualism to arrest and ultimately reverse emissions. What better place to start than here, at the university in the center of the city recognized as the global capital of innovation?

San José State must treat climate change as an *emergency...* because it is. How can we prepare our students to do their very best—to help lead humanity back from the precipice to a sustainable environment and a healthy society?

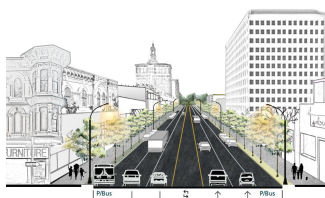
What can San Jose Staté do?

The Spartan Superway project began in 2012 and has engaged more than 200 SJSU students across the disciplines of engineering, business, urban planning, and industrial design to show what can be done with solar-powered automated transportation as a profound response to the climate emergency.

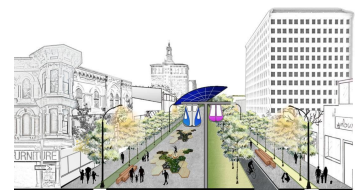


This has included designing and building working demonstration models at full scale and small scale, as well as publishing design studies and analyses. Spartan Superway has garnered international awards and has impacted over 100 visiting summer interns from Brazil, France, Mexico, South Korea, Sweden and the US; over 100 external students from the Netherlands, Presidio Graduate School, Southern Illinois University, Fresno State, and South Africa; and 10 SJSU Masters students. This experience sets the stage for a far-reaching initiative.

Far more than engineering is needed to realize a new paradigm in truly sustainable public transit, and to translate the climate emergency into a streamlined process for project execution. To that end, we envision the formation of an **Innovation Center for Solar Automated Transportation** as an institutional framework, whereby faculty and students from disciplines across the university will collaborate with corporate sponsors and governmental agencies to carry out cross-disciplinary research and development to support the broad deployment of SPARTAN systems.



Spartan Superway can transform San José to carbon-free, collision-free, attractive, enjoyable urban landscapes for people.



"The future of Silicon Valley critically depends on our development of a vibrant urban center," Mayor Sam Liccardo of San Jose said.... "We're trying to retrofit the city that was built for automobiles into a city built for people."

Where shall we start?

We can inspire a viable multi-billion dollar solar powered transportation network in Silicon Valley, and become the first major city in the world to kick the oil habit... all because the entire San José State academic community collaborated to take the lead.

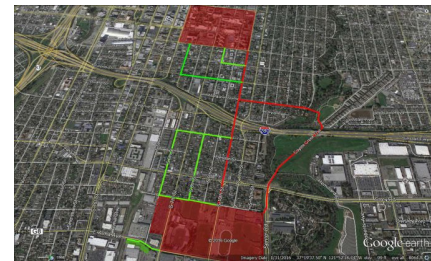
What better venue than **San José State, powering Silicon Valley**, with a SPARTAN system connecting the Main Campus with South Campus and CEFCU (Spartan) Stadium, to prove the flexibility of the design in a real world application, powered by industry leaders and academic sponsorship side by side? Summer interns in 2016 and 2017 made progress designing a direct connection between the South Campus (athletic fields, parking) and the main campus, laying the groundwork for Phase 2 (red, below right) and Phase 3 (green) on the critical path to a robust network running throughout the Valley. Imagine the impact if the University takes the lead to partner with San Jose and neighboring cities, major corporate sponsors, VTA, and other stakeholders to make solar-powered automated transportation a reality and lead the rest of the world with a game-changing response to the climate emergency.



Test track location



Test track (as submitted to City Planning)



Route plans, south to main campus

Economics

Spartan Superway is an innovative integration of existing technologies for carbon-free public transit with compelling economic advantages. At scale, the costs of Installation (with rational rights of way access, environmental review, and entitlements), operations, and maintenance will be significantly less than other public transportation options. This combination of low costs with high passenger capacity gives a SPARTAN system significant financial and environmental advantages, even demonstrating financial characteristics that will attract private capital.

Conclusion

Through the Innovation Center for Solar Automated Transportation, a highly trained professional workforce will emerge as students engage with government agencies, real estate project developers, manufacturers, engineering procurement contractors, and investment bankers. The Center will coordinate with all stakeholders in the design, testing, certification, entitlement, construction, and optimization of a fundamentally new approach to mobility, encompassing Silicon Valley, the Bay Area, and beyond.

References

More at <http://www.superway.us/>. Much more at <https://www.inist.org/library/>