

Spartan Superway Project

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11NOV2015

Summary

The Spartan Superway is an interdisciplinary, international effort to develop the next generation of truly sustainable urban transportation



The Problem

Current mobility options in urban areas suffer from myriad problems, and proposed solutions are inadequate to the challenges

- Congestion=>loss of productivity
- Safety=>machines rule the streets and everything competes at grade
- Fossil fuel based=> *still* addicted to oil
- Alternatives are sub-par and poorly serve those who cannot drive



The Solution

Solar-powered automated transit networks (ATN) squarely addresses the problems with current urban mobility options and offer attractive solutions:

- Fully automated vehicles
- Elevated, grade-separated guideways
- Off-line stations => non-stop origin-to-destination service (like a taxi)
- On demand scheduling
- Guideways can be placed in existing R.O.W.
- Plays well with transit oriented development
- Grid-tied solar PV placed above and all along guideways collects power for 24/7 operation



ATN is not a new concept. Origins date back to the 1950s. Approximately five systems worldwide currently exhibit ATN-like characteristics, but are very modest in scope. ATN has yet to deliver on hoped-for promise. A compelling design case has yet to emerge (walkie-talkie vs. iPhone). Superway is the compelling design case.



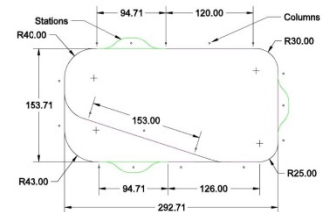
ATN Development at SJSU

2012-2013: 11 ME, 4 CmpE, 3 Business, 1 Urban Planning

- System design for Solar Skyways competition (\$5k award)
- 1/12 scale model test track
- Control system design
- Transit supportive land use metrics and land use entitlements process

2013-2014: 15 ME, 3 EE, 2 CE, 2 Urb. Plan; 25+ Indust. Design

- Full scale guideway section and movable bogie
- Improved 1/12 scale model
- ATN vehicle design concepts and user-interface design studies
- Demonstrated at Maker Faire 2014 and InterSolar 2014
- Incorporated the ATN Association (ATNA)



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2014-2015: 26 ME, 2 CmpE, 1 CE

- Full scale guideway with operational switch
- New scale model that more closely matches full scale
- Cabin half-model
- Revised solar PV
- Demonstrated at Maker Faire 2015
- Demonstrated at S.T.E.A.M Fest 2015
- International Summer Intern Program (7 from Brazil, 4 from Sweden, 6 from S. Korea, 2 from France, 6-10 from US)



2015-2016 (current): 42 BSME, 2 MSME 3 EE, 2 MSSE

- Intermediate-scale model with active cabin suspension
- Expansion of small scale model for controls development and network operation demonstration
- Failsafe design
- Full-scale solar integration
- Finite element analysis of guideway
- Guideway torsion test
- Full scale thermal test



2016 and beyond:

- Expansion joint research and testing
- Full scale implementation of active suspension and vehicle design
- Controls and user interface software development
- Station design
- Full-scale test track
- Guideway and support DFM
- ATN Industry Council establishment
- Formalization and expansion of summer intern program
- Fundraising for continued research



Major Sponsors



For more information

<http://www.engr.sjsu.edu/smssv/>

<http://www.inist.org/projects/spartansuperway>

<http://spartansuperway.blogspot.com/>