

# Spartan Superway Project

BJ Furman

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.



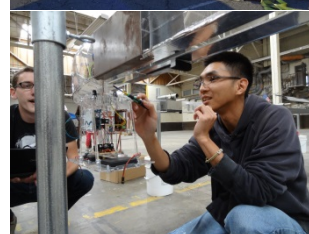
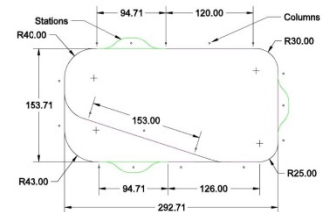
## ATN Development at SJSU

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)



## Spartan Superway Project

BJ Furman

11NOV2015

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/>