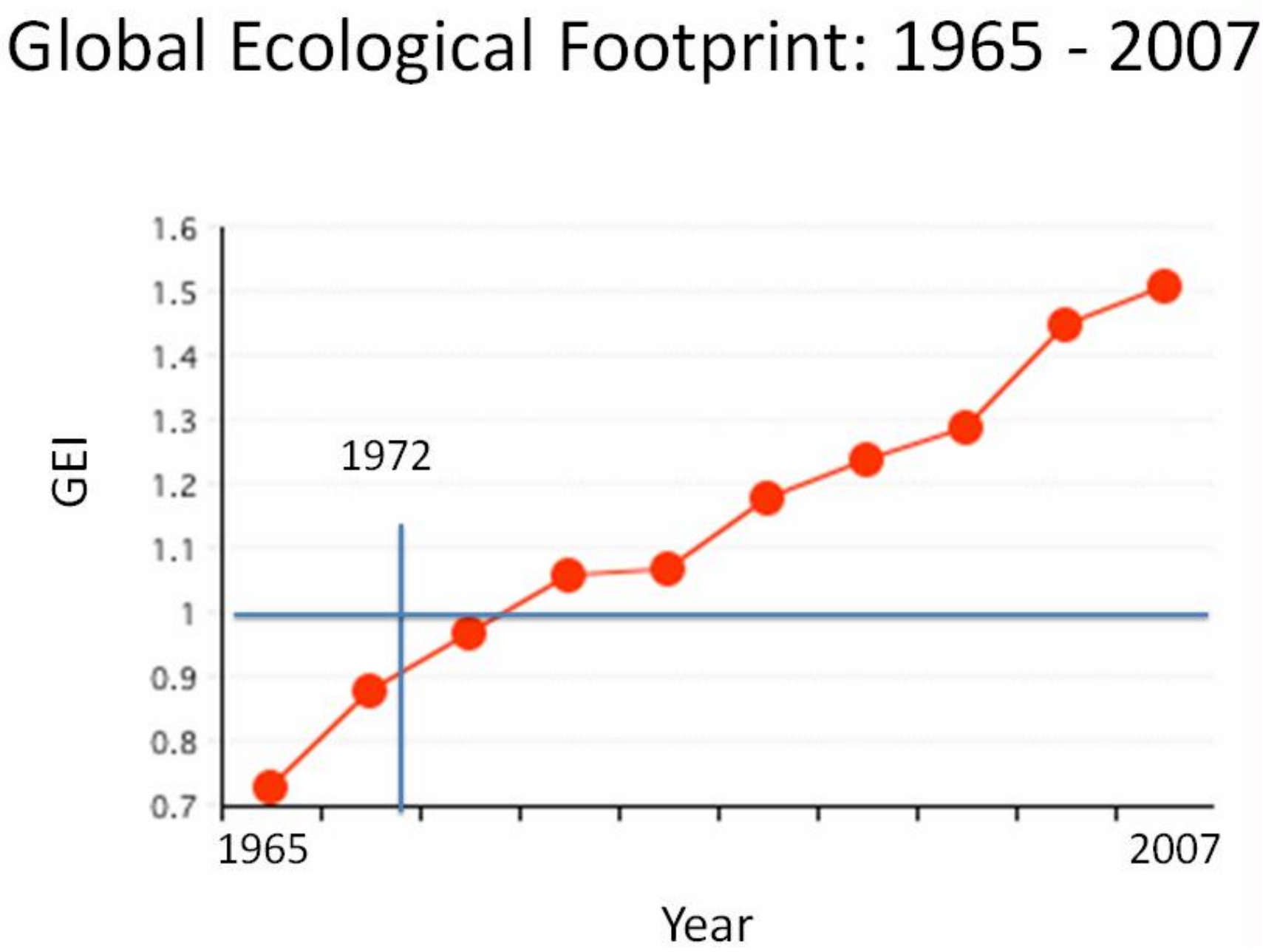
Sustainable Transportation in Silicon Valley

Leadership Sunnyvale

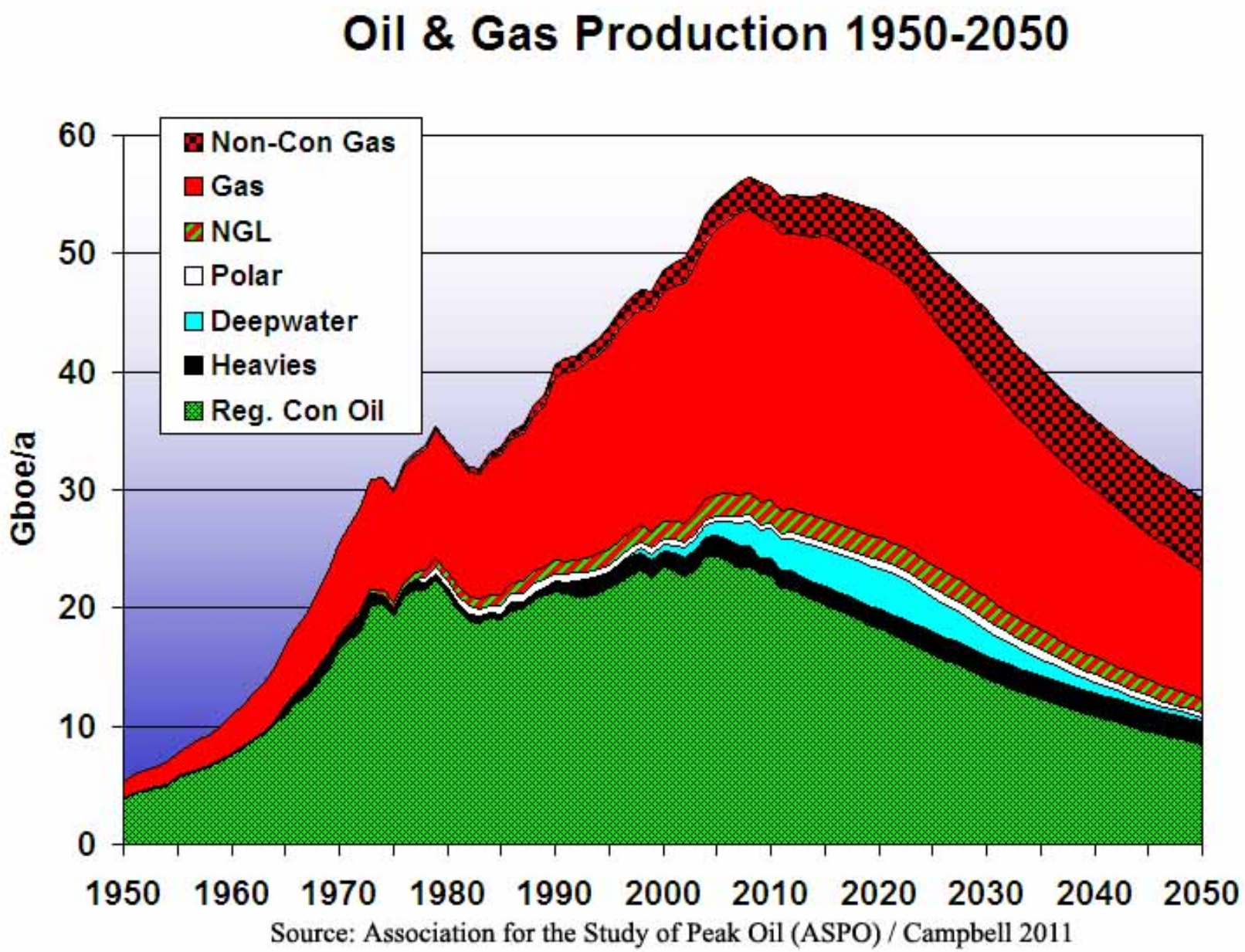
Ron Swenson
International Institute of
Sustainable Transportation

June 6, 2014

We are consuming more than one planet



There will be consequences



We can't solve problems by using the same kind of thinking we used when we created them.

– Albert Einstein

transportation

We can't solve ^problems by using

fuels

the same kind of ^~~thinking~~ we used

when we created them.

Pete Christensen

– Albert ^Einstein

Stanford Report, May 6, 2014

Stanford to divest from coal companies

Acting on a recommendation of Stanford's Advisory Panel on Investment Responsibility and Licensing, the Board of Trustees announced that Stanford will not make direct investments in coal mining companies. The move reflects the availability of alternate energy sources with lower greenhouse gas emissions than coal.

A little history … I went to Mexico in 1992…

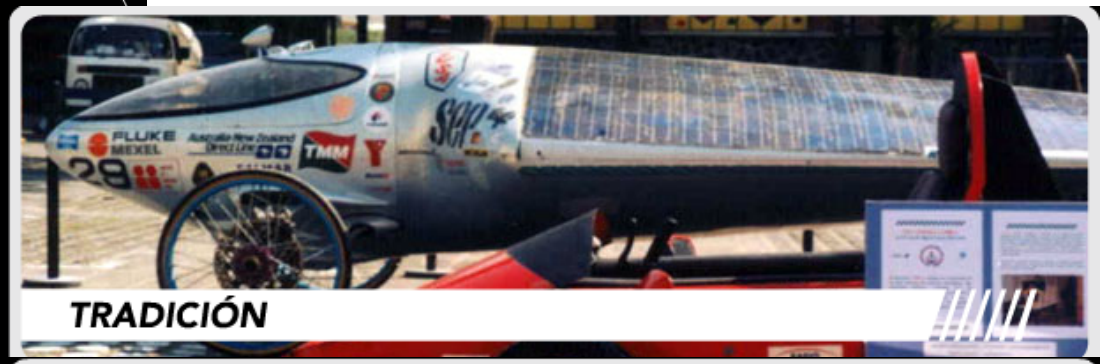
… and raced across the USA & Australia

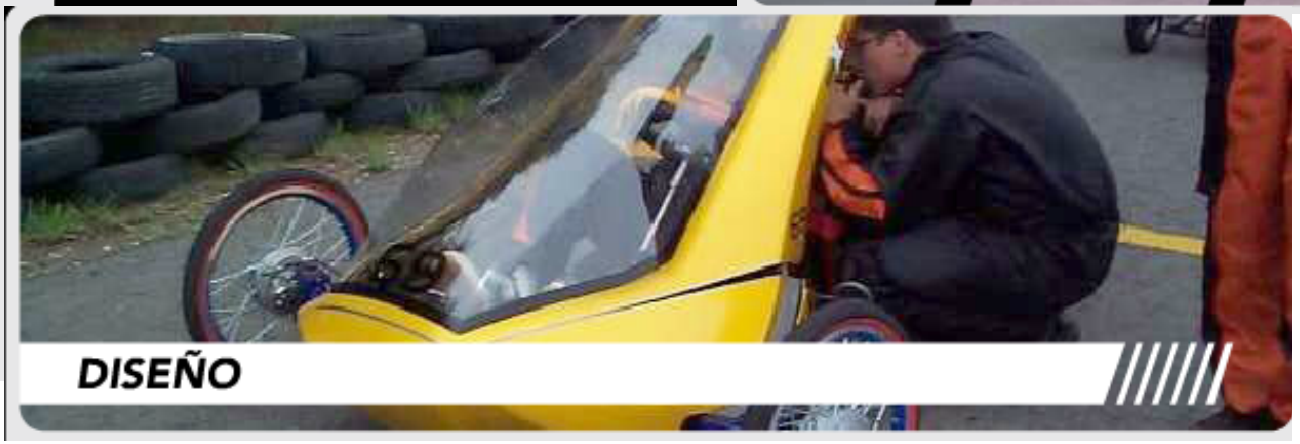
20	8	Helios	Fin D9 0959	3010	70.49	42.50	FR
21	400	Heliotrope	Fin D9 1041	3010	71.31	42.09	FR
22	6	Sulis V	Fin D9 1132	3010	72.22	41.59	JA
23	2001	Kirenjaku	Fin D9 1227	3010	73.17	41.07	JA
24	45	Sonec	Fin D9 1244	3010	73.34	40.19	JA
25	16	Afterburner	Fin D9 1327	3010	74.17	40.52	US
26	32	Solvogn Danmark	Fin D9 1331	3010	74.21	40.48	DK
27	66	Northern Sun	Fin D9 1335	3010	74.25	40.45	CA
28	999	Jona Sun	Fin D9 1509	3010	75.59	39.61	JA
29	49	Yokohama Toys	Fin D10 1014	3010	80.04	37.59	JA
30	69	Pumpkinseed	Fin D10 1254	3010	82.44	36.38	US
31	18	Annesley College	Fin D10 1401	3010	83.51	35.90	AU
32	9	Mad Dog	Fin D10 1414	3010	84.04	35.80	UK
33	11	Los Altos	Arrived D10	3010			US
34	19	Hama Zero	Arrived D11	3010			JA
35	**29**	**Tonatiuh Mexico**	**1927 km**	**1927**			**MX**

There is more evidence of Japanese engagement in thinking ahead

2005

Almost 20 years later, Toyota is still leading the way, sponsoring EV learning in Mexico!





2014

International

We can learn from Europe

CityMobil is a partnership of

1. Universities
2. Cities
3. Industry

We can learn from Mexico

Modutram is a consortium of

1. Universities
2. Government
3. Industry

Sistema Autotrén: tecnología GRT al alcance

ModuTram
LINT
MASTRETTA
Tec de Monterrey
ESTRUCTURAS DIVA
Sistema BEA
dinko
UNIVERSIDAD PANAMERICANA
CREACERO
Instituto Mexicano del Transporte
gremiodiseño
BECCAR
Cinvestav
ITESO
oesjal

We can learn from Sweden

US – Sweden Memorandum of Cooperation

New urban infrastructure requires multi-sector engagement

1. Universities

2. Cities

3. Industry

Sustainable

Speaking of Coal… Today's Quiz: What's the difference between…

Power …

… Energy?

time!

Let's revisit that Quiz: What's the difference between…

Sustainability is defined as balancing economic, environmental and equity interests.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

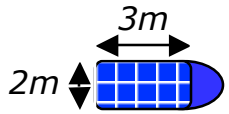
… *time*

San José asked industry if an ATN system could by powered by solar

- Ensure that the ATN system is built … utilizing ***renewable energy***
- … maximize energy efficiency and potentially be powered in whole or part by ***renewable energy***.
- … and calculating carbon emissions reductions achievable through ***renewable energy***
- evaluate cost/benefits of using ***renewable energy*** to offset all or a portion of the energy requirements
- Provide analysis of cost/savings and recommend specifications to execute energy-efficiency and ***renewable energy*** strategies…

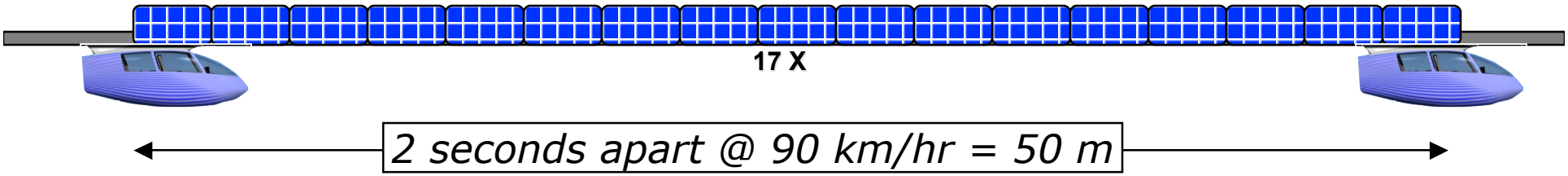
2009

So let's see if solar energy is sufficient to meet SJ's challenge



Solar Race Car averages 90 km/hr with 6 m^2 solar panel

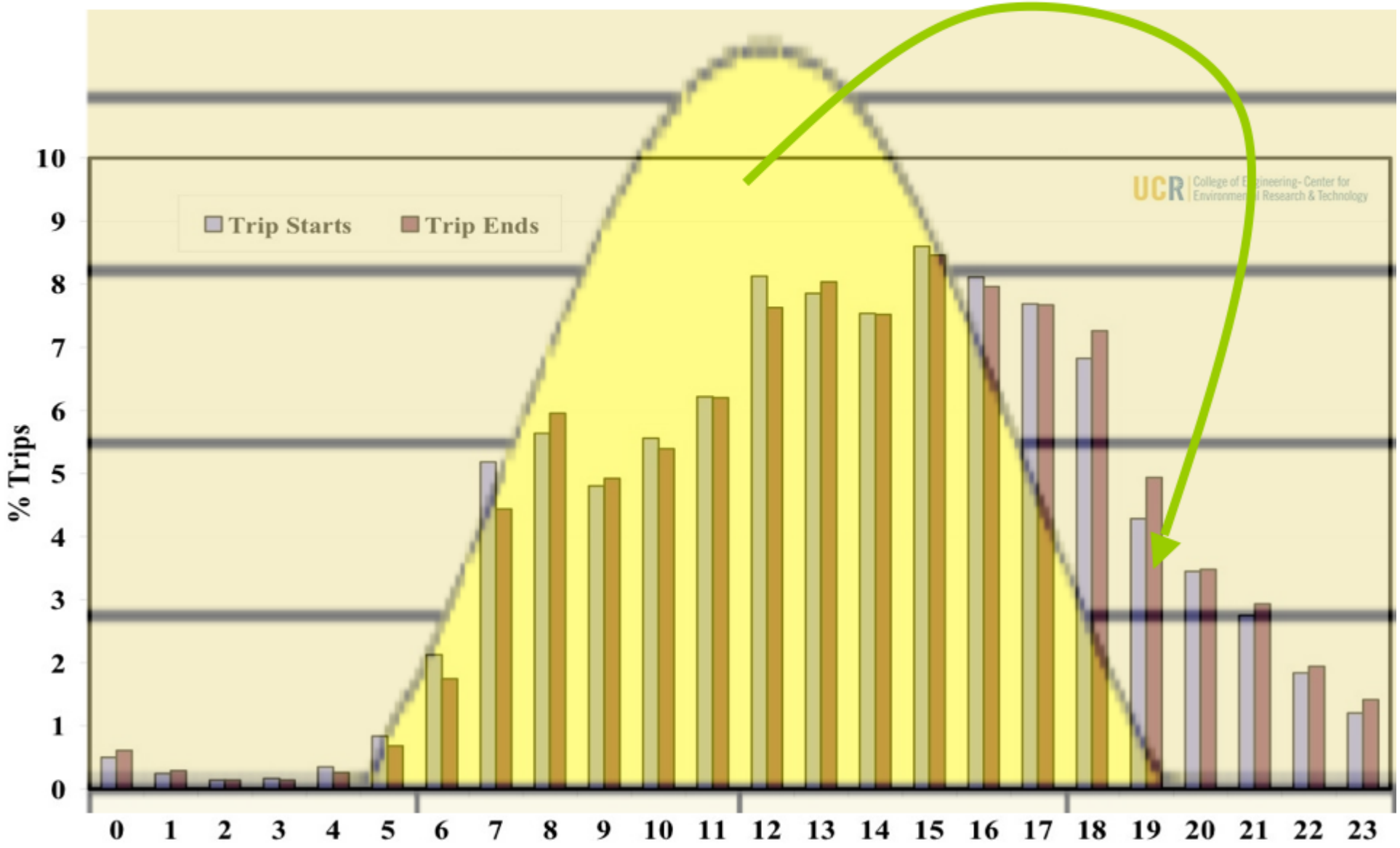
Knowing it can be done, let's ramp onto the Solar Skyway …



… Podcars have 50 m ÷ 3 m = 17 X more collection area than solar race cars!

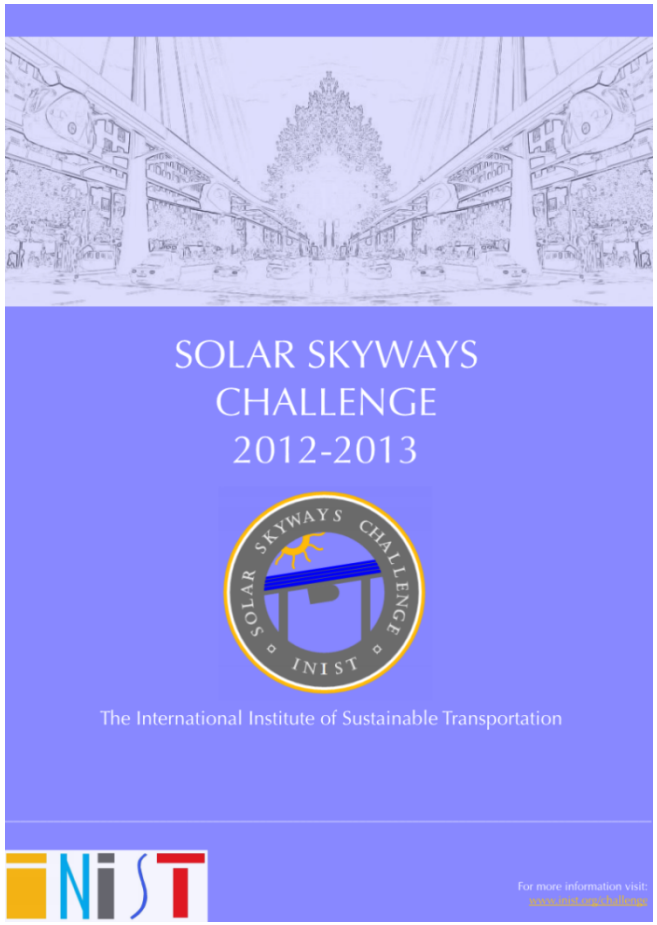
2006

Typical trip patterns closely match the pattern of sunshine, with evening extension



But if industry can't figure out how to do it, maybe young people can

So INIST issued the *Solar Skyways* Challenge



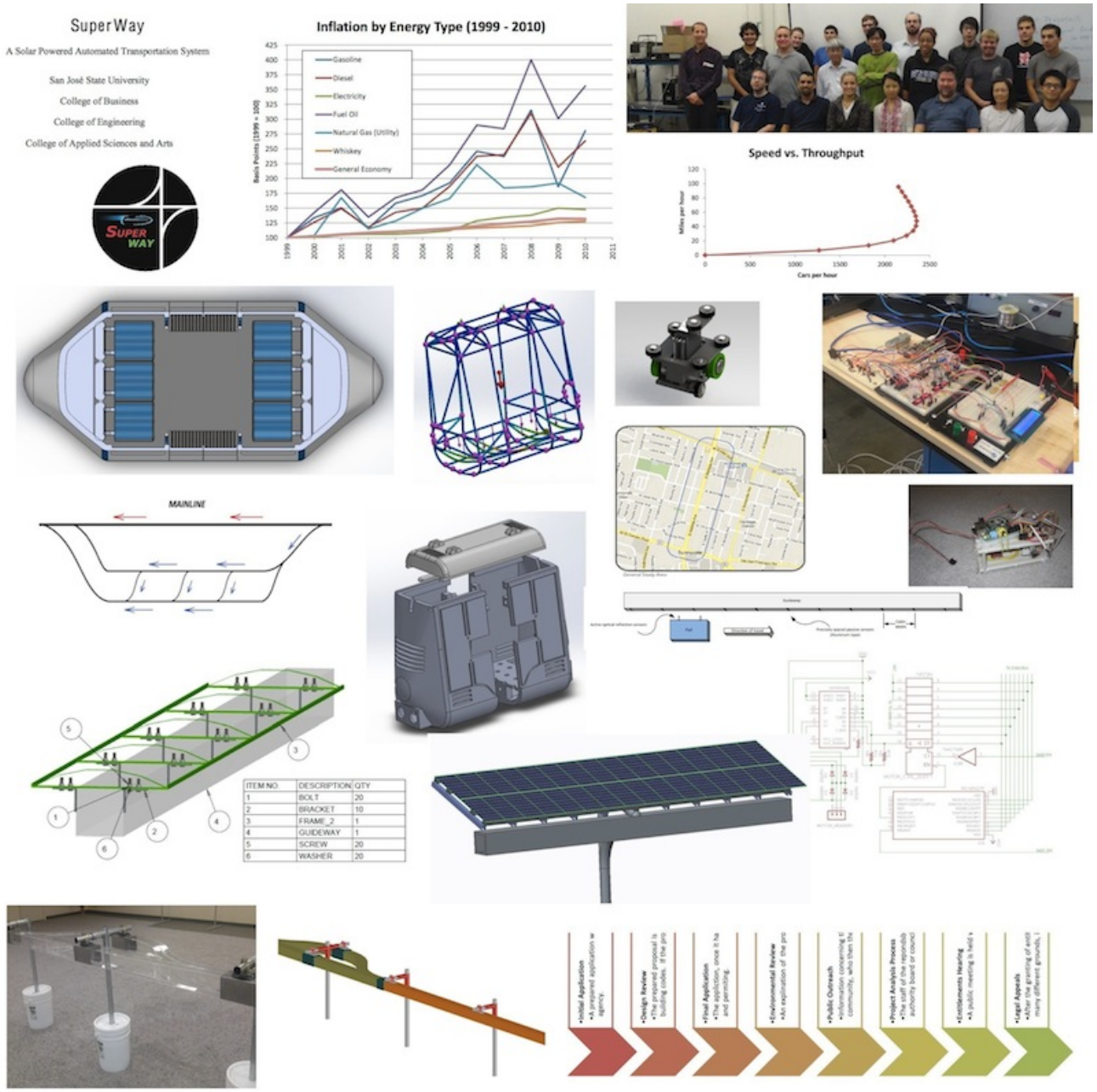
2012

Universities

The first student team from Delft University demonstrated the concept by animation

2011

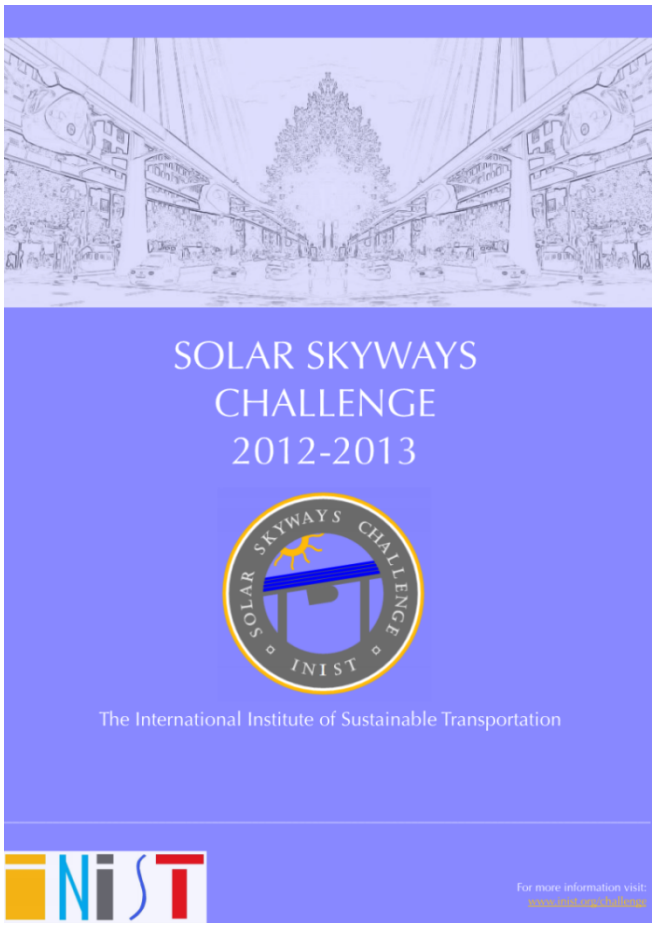
San José State ME's joined the challenge



2012

San José State won the first place $5k award from INIST

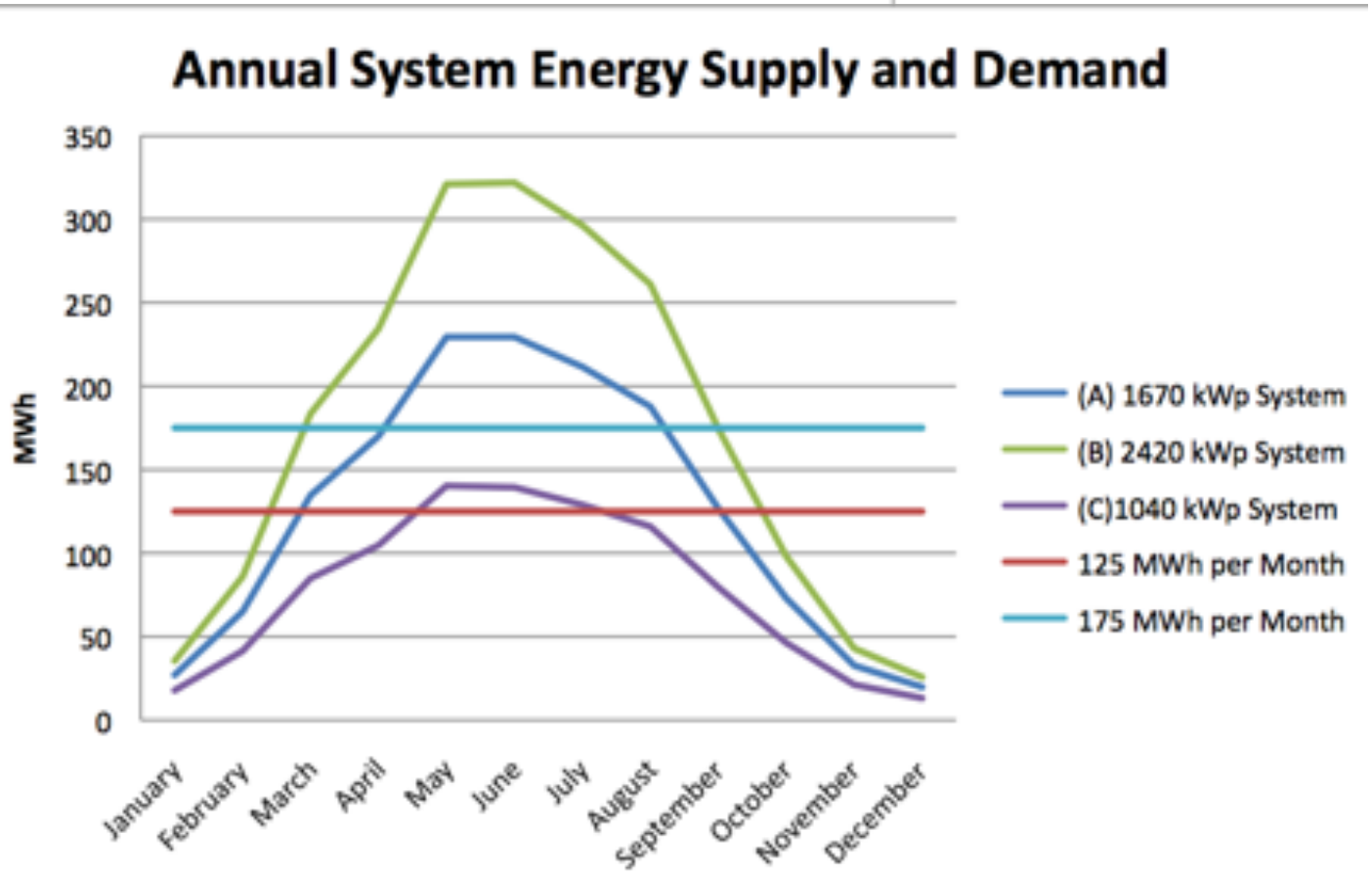
Bryan Burlingame receiving the award from Ron Swenson, co-founder of INIST



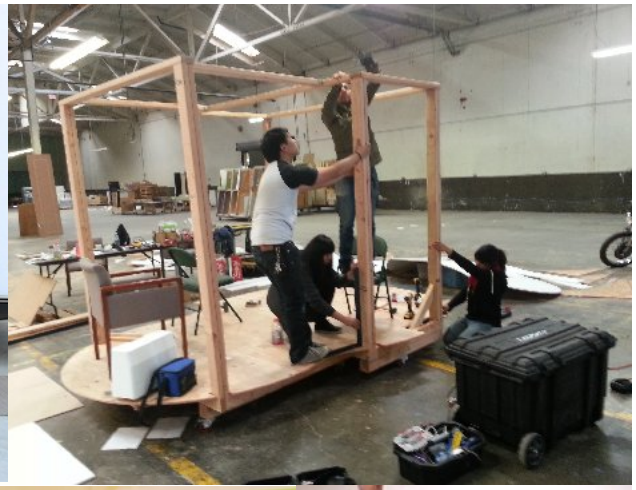
2013

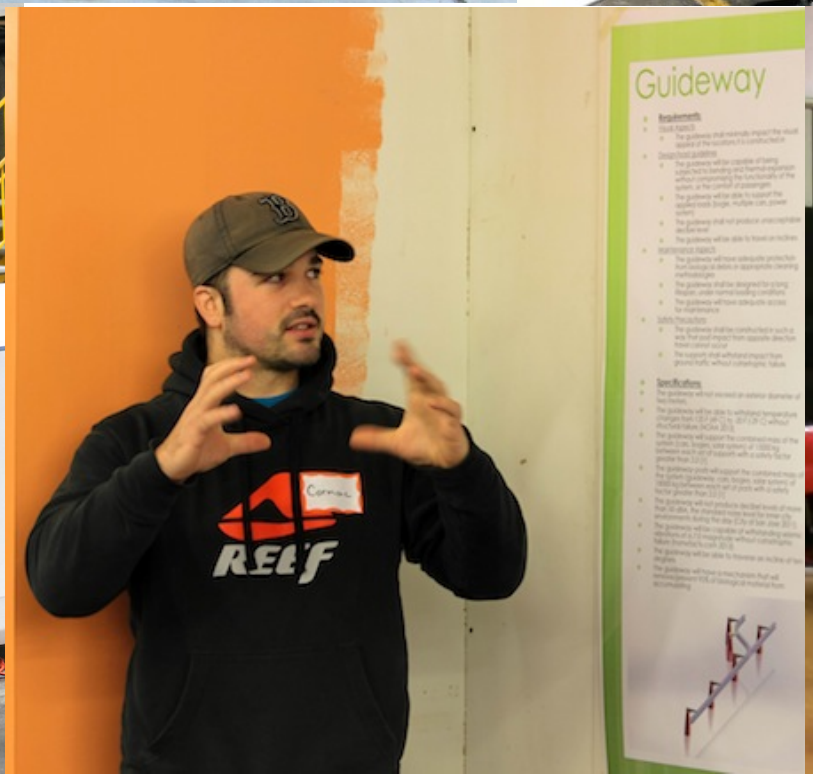
Uppsala University won second place, designing a solar ATN at 60º N

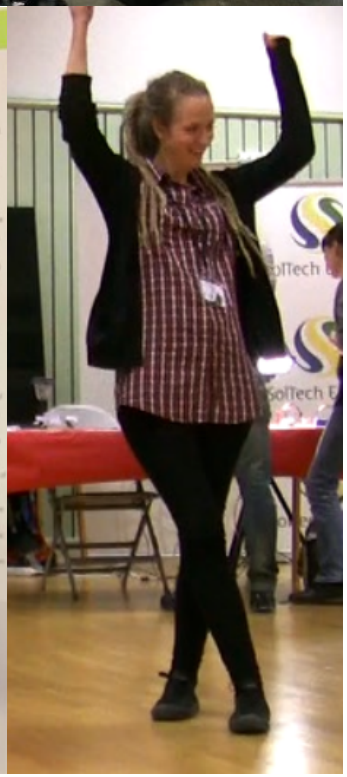
rly power consuption during the
ypical day types, high case



More teams have now joined the challenge

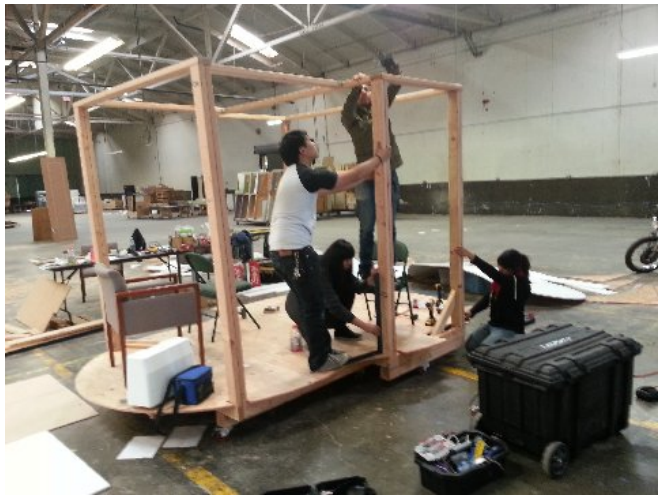


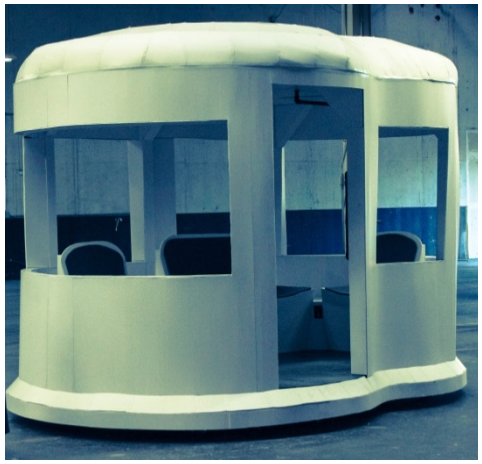


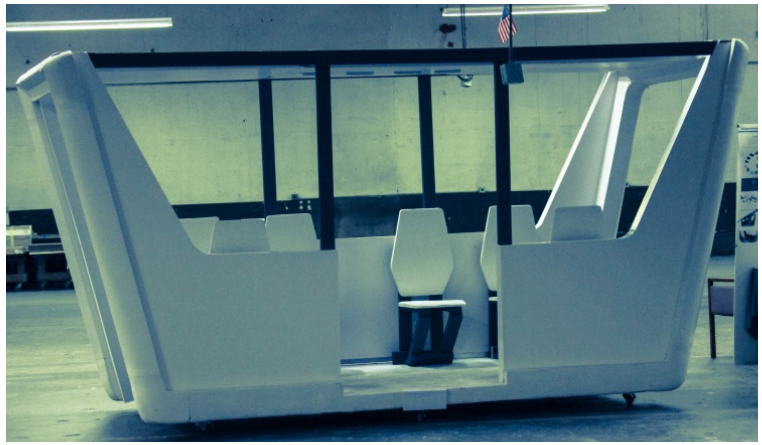


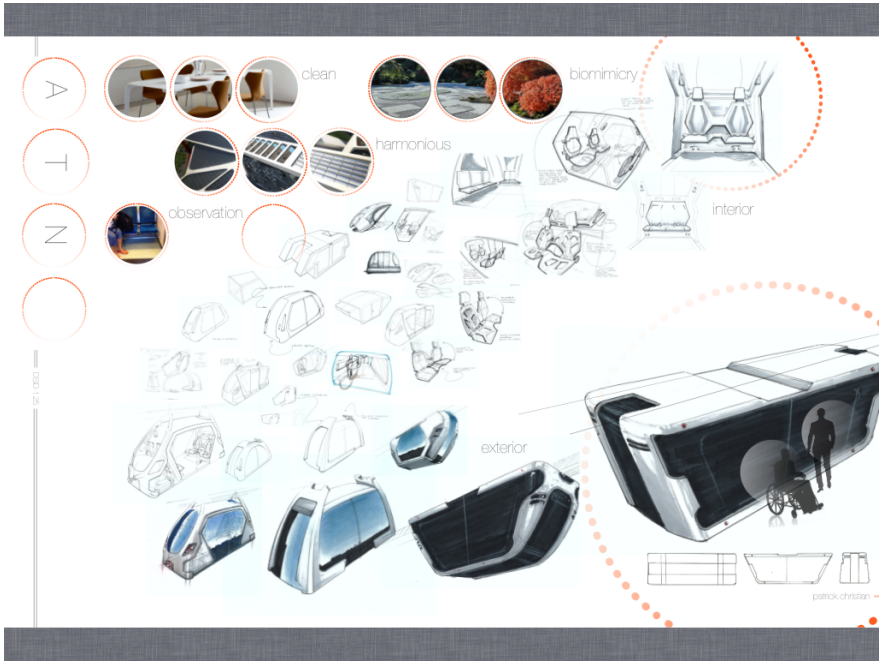
MEET THE TEAM

SJSU Industrial Design students are thinking outside the transit vehicle ‘box’



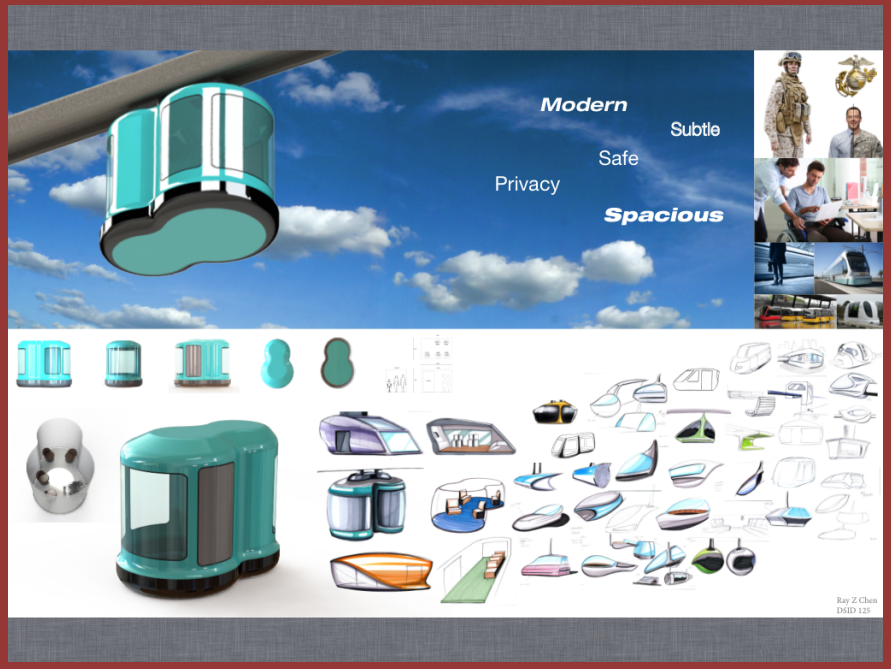






Design

Industrial



SJSU Human Factors students are innovating the ATN user interface

Expert Heuristic Analysis

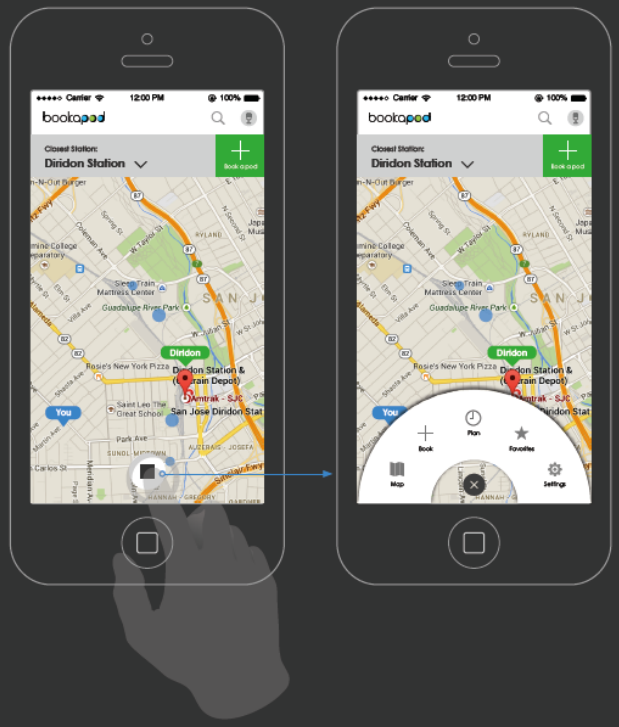
Navigation: Why

Control
There are good elements here. Users can tap on the close icon, anywhere on the screen (outside of the nav), or even swipe to close it.

Visibility
The arch is very visible, and is immediately attended to on tap. This will lead to users finding the information they are searching for quickly.

Accessibility
This design caters to both right and left handed users. Properly designed interfaces cater to all types of users.

Follows Fitts' Law
This leads to a better user experience because it is easy to locate the primary buttons and options here. The bigger the target is, the easier and quicker it is to reach it. Interfaces that provide large touch targets and adequate spacing are easier to use.



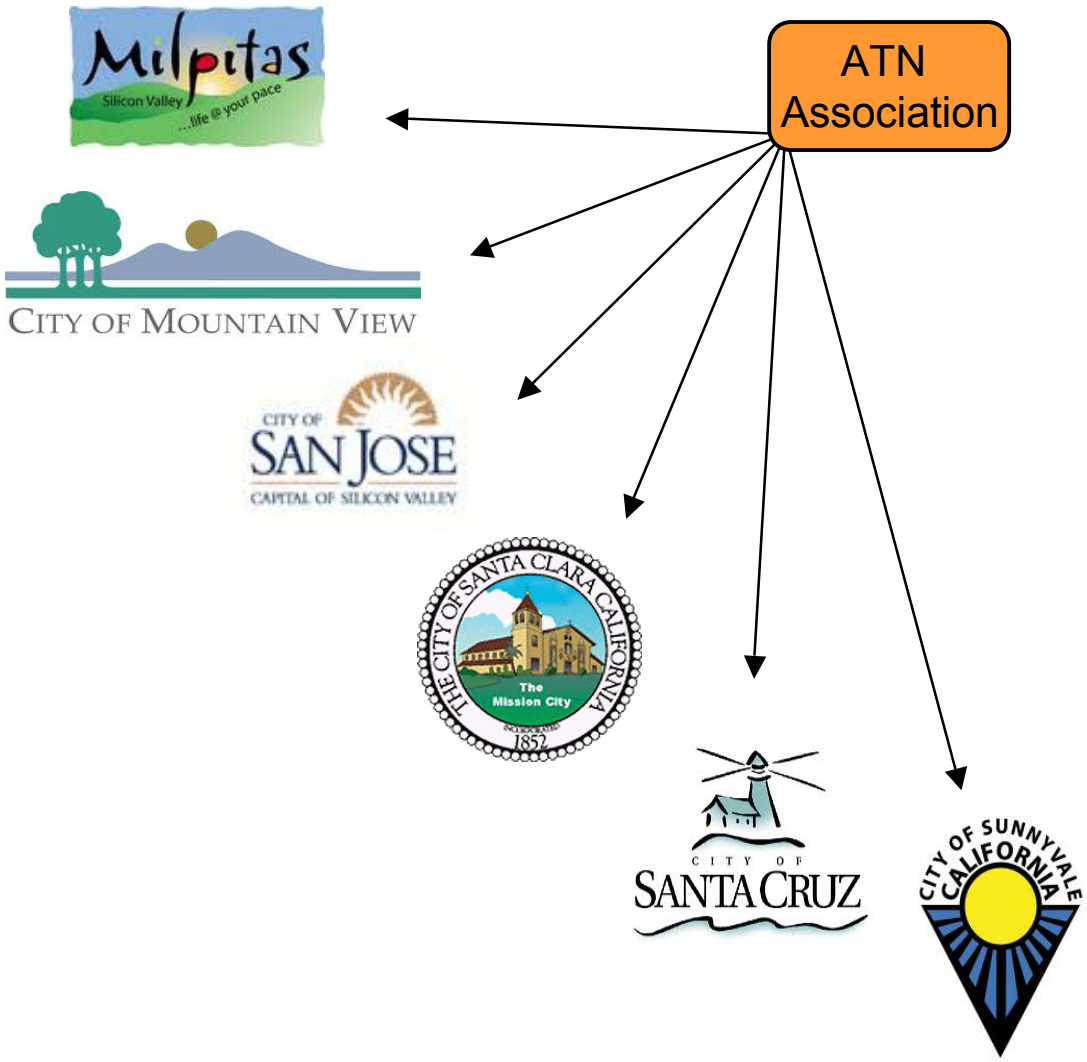
Nerpio, Vaughn-Luma, Vora, Wendt
October 25, 2013

DSID 131
San Jose State University

bookapod

Cities

INIST is building a coalition of cities developing ATN



2013

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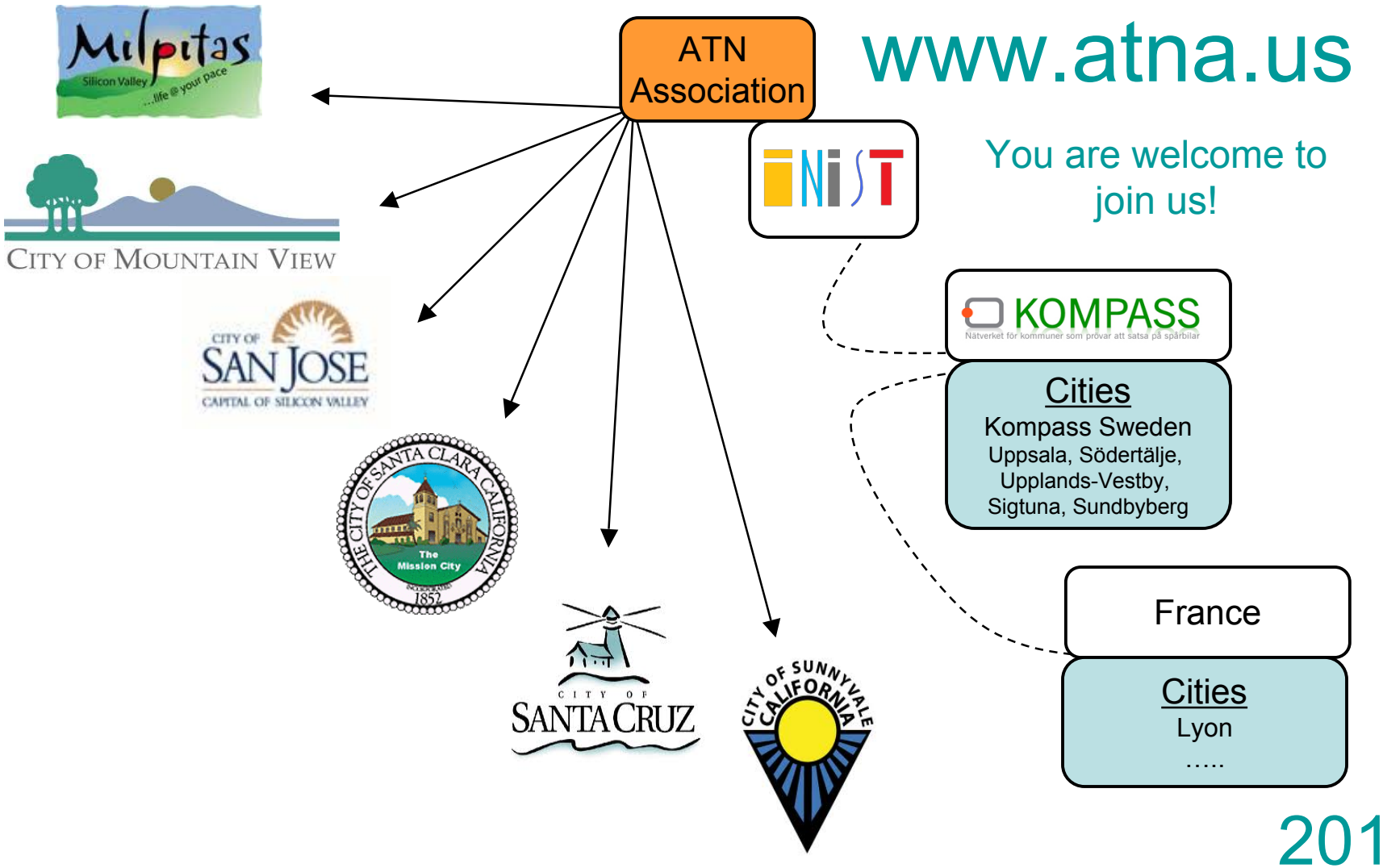


2013

INIST is training students to create 4D models of ATN networks

With urban planning students and mentors

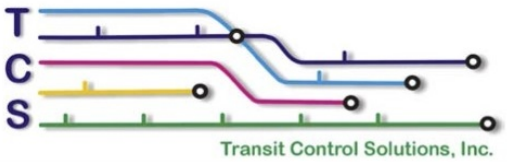
2014

In partnership with Encitra …

…Urban planning students are creating 4D models for an urban village

Industry

Industry is sponsoring and mentoring San José State students



The academic - industry - city financial relationship is now being defined

MEET THE TEAM






Presidio MBA students have developed the business case for ATNs, based on Public Private Partnerships

2014

We must raise the bar to succeed

10X

Leadership Sunnyvale: More Info

Universities

www.superway.us

www.solarskyways.com

Cities

www.atna.us

www.encitra.com

Industry

www.podcarcity.org

Thank you!

www.inist.org