



SOLAR SKYWAYS CHALLENGE 2012-2013



The International Institute of Sustainable Transportation



For more information visit:
www.inist.org/challenge

OVERVIEW

The 2012-2013 Student Challenge is the first of its kind to engage and empower local students from regional universities in raising the bar of sustainable transportation. The mission of the International Institute of Sustainable Transportation (INIST) is to assist cities and their constituents in the transition from life based on fossil fuels to a future based on renewable energy. Students from all disciplines will be challenged to contribute to this mission by working together in multidisciplinary teams and influence the development of solar-powered Automated Transit Networks (ATN). The goal is to help cities move towards a more sustainable future while empowering students to take an active part in designing the infrastructure of the cities in which they live.

Professors are encouraged to incorporate the Student Challenge in the university curriculum, thereby allowing students to fulfill the educational goals while gaining green industry experience.

STUDENT CHALLENGE GOALS:

1. Raise awareness of the necessity to support innovative transportation solutions beyond cars, and the possibilities that exist to do such.
2. Increase the involvement of the academic community in addressing current transportation-linked infrastructure issues and needs.
3. Encourage regional undergraduate and graduate students to contribute to and influence the process of creating more sustainable transportation solutions in the Bay Area.
4. Develop an awareness of and an interest in solar-powered ATNs as a vital and important area for academic research and future careers.

AWARD

The student challenge has no entry fee and the best performing teams will be invited to present their projects at the award ceremony of the annual international Podcar conference, Podcar City 7, in the fall of 2013. The two best performing teams will also be awarded a \$5000 grant for project continuation.



ABOUT INIST

INIST is a 501 (C) (3) non-profit organization based in Santa Cruz, California. INIST initiates, finances, and defines urban change projects to assist the transition from fossil fuels to renewable energy resources. Its staff and partners have comprehensive skills and experience in the core areas of project management, general design, energy analysis, innovative transportation solutions, and public outreach and interaction. In addition, INIST collaborates on its projects with top key professional organizations, architects, developers, transit specialists, solar consultants and virtual model providers.

THE CHALLENGE

BACKGROUND

The necessity to transition from a life based on fossil fuels to a sustainable future based on renewable energy challenges not only our way of living, but also the future of transportation. Personal transportation has grown remarkably during the last century and while the car has become a symbol of ultimate transportation freedom, it has also been recognized to be a major contributor to the release of greenhouse gas emissions. Alternatives to fossil fuels are becoming increasingly available, however, merely a transition towards more sustainable cars does not solve other severe automotive-related problems concerning traffic congestion and road safety. With these concepts in mind, the INIST Student Challenge calls for students to help the Bay Area take the next step in the transportation evolution which will reduce the consumption of fossil fuels, lower greenhouse gas emissions, ease traffic congestion, and improve the safety and quality of urban life.

INIST challenges regional university students to help in evolving personal transportation. Students are expected to work as teams with the aim of building and improving solar-powered, personalized, automated transit networks. Students of all disciplines are encouraged to participate. Teams will receive support and will have access to extensive experience and expertise in solar technology and sustainable transportation from INIST. INIST will also help establish entitlements and work with Bay Area cities in conjunction with students and professors to lay the groundwork for the implementation of these solar-powered transportation systems.

THEME 2012-2013

The Bay Area is expanding. Large corporations such as Google are expecting to increase their workforce by the thousands in Mountain View alone, creating job opportunities on one hand but on the other adding to the already existing severity of traffic congestion and pollution in these cities. How can ATNs help cities within the Bay Area expand without exacerbating the existing problems with congestion and greenhouse gas emissions?

ELIGIBILITY

The Student Challenge is open to undergraduate and/or graduate students from regional universities in the Bay Area of California. Students from all disciplines can participate. Participants will create and work in teams with a minimum of three members. Multidisciplinary teams and cross-departmental collaboration is required. Only one entry is permitted per team.

Students are strongly encouraged to work with faculty advisors and integrate the student challenge into a capstone project or similar culminating experience. By incorporating the Student Challenge into the University curriculum, educational goals will be fulfilled while simultaneously empowering students to steer their communities towards a more sustainable future.

TEAM COMPONENTS

OVERVIEW

The development of real world transportation solutions requires persons of many disciplines working in unison. Teams must be multidisciplinary, and success is not measured only by a working design. Team performance will also be judged on visual appeal, public input, energy efficiency, city input, and any other components that advance the scope of realism in the project. While teams will have a project focus and may include more members of one discipline than another, it is important to remember that for a transportation system to be implemented in a city it must be well received by the public and governing city agencies. To stimulate interdisciplinary outreach and interaction, some examples of design components from different disciplines are given below. The examples are given to help expand the scope of a project and are by no means exhaustive of the possibilities. Without drawing any restrictive boundaries, projects have been divided into four components to aid in identifying potential team members. The project components are: technical, civic, artistic, and societal.

TECHNICAL COMPONENT

The technical component encompasses work on the physical systems of and related to podcars. Examples:

- Making a scaled working prototype while being mindful of energy efficiency.
- Designing and carrying out a study to test the efficiency of a podcar network.
- Redesigning a component of the podcar system to increase efficiency.

Limited Contribution: Covers contributions to the technical component of a project which are of limited scope. Team members making such a contribution might focus on a making a specific physical component more efficient or study a limited or simple network.

Advanced Contribution: Covers contributions to the technical component of a project which are broad or citywide in scope. Team members making such a contribution might focus on a large scale podcar network, considering multiple layouts which contribute to significant efficiency gains. Participants must seek out information to make the design or study more realistic. To understand the specific design goals and limitations, the creation of a dialog with other team members researching public opinion and network concerns will be essential.

CIVIC COMPONENT

The civic component encompasses work concerning community or citywide networks and their implications. Examples:

- Design a podcar network model and analyze its implications.
- Work with people from your city planning department or another public office to research the potential benefits and challenges of a podcar network in your city.
- Research the process for public transportation development and work with your city's planning department to initiate the permitting process for a trial podcar system.

Limited Contribution: Covers contributions to the civic component of a project which are of limited scope. Team members making such a contribution might study the benefits and ramifications of placing a podcar track along a specific corridor. Alternatively, the scope of their study might be limited by focusing on some particular benefit of podcar networks, such as: traffic reduction, accident reduction, increased usable ground space, etc.

Advanced Contribution: Covers contributions to the civic component of a project that consider citywide networks or interact with city and school officials in a highly dynamic way. Team members making such a contribution might create a feedback loop to stimulate conversation about the practicality of podcars between the public and the city. Or perhaps the team will focus on network efficiencies of different citywide networks. Participants must seek out information to make the design or study more realistic. To understand the specific design goals and limitations, the creation of a dialog with other team members researching public opinion and physical operations will be essential.

ARTISTIC COMPONENT

The artistic component encompasses visual and multimedia aspects of design and presentation that create a tangible and emotional connection to podcars. Examples:

- Portray a podcar or podcar network with an emphasis on visual appeal and realism.

- Design a podcar layout which maximizes passenger comfort or has multiple functionalities, such as bike racks, or seats that can be converted to better store cargo.
- Create a visual or multimedia display which in a novel way shows some of the benefits of podcars; less noise, more open space, no traffic, etc.

Limited Contribution: Covers contributions to the artistic component of a project which are of limited scope. Team members making such a contribution might create a model of an area of their town, demonstrating through visual appeal some of the benefits of podcars. Alternatively, such a team member may design and implement a painting scheme for the podcars and track.

Advanced Contribution: Covers contributions to the artistic component of a project which consider a broad or citywide scope. Such a contribution might include multimedia design elements that go beyond the visual in portraying the benefits of podcars. Contributions in this section should be engaging to the public and may include some interactive elements. Participants must seek out information to make the design more realistic. To understand the specific design goals and limitations, the creation of a dialog with other team members researching physical and network operations will be essential.

SOCIETAL COMPONENT

The societal component encompasses work on events, polls, and studies which are interactive with the public and serve to raise awareness while collecting public opinion information. Examples:

- Create and carry out a poll to gauge public opinion on podcars in your area.
- Work with a city or school office to raise awareness and support for podcars.
- Organize an event where students and community can learn about and discuss podcars. Gather opinions and findings during the event.

Limited Contribution: Covers contributions to the social component of a project which are of limited scope. Team members making such a contribution might create a survey and use it to poll public opinion about various aspects of podcars in their town. Such a study should be designed to allow clear conclusions to be drawn and compiled into a report on public sentiment towards podcars in the study area

Advanced Contribution: Covers contributions to the social component of a project which consider a citywide scope and varied sources of input. Team members making such a contribution might conduct a series of polls, some with, and some without prior information sessions. A study could be done to determine what information on the benefits of podcars is most effective in influencing public opinion. A project which focuses on interaction and cooperation with city and school officials could also be covered here. Participants must seek out information to make the design more realistic. To understand the specific design goals

and limitations, the creation of a dialog with other team members researching physical and network operations will be essential.

CONTRIBUTION LEVELS

Limited Contribution:

- 1-2 team members focused on this contribution.
- Narrowed focus, the contribution considers a specific component, concept, or study relating to podcars.
- Limited multidisciplinary collaboration due to narrowed focus.
- Focus is on the specific components or elements addressed, but realism and interoperability must still be achieved.

Advanced Contribution:

- Minimum of 3 team members focused on this contribution.
- Broad focus, the contribution addresses multiple components or citywide systems.
- Multidisciplinary collaboration required throughout the planing and implementation phases.
- Realism should be maximized through research and interdisciplinary collaboration and exchange.

SUMMARIZATION MATRIX

	Entry Contribution	Advanced Contribution
Physical Component	Minor efficiency improvements	Significant efficiency improvements
Civil Component	Small scale network, or single corridor study	Large scale or city wide network study
Artistic Component	Display shows a few of the benefits of Podcars	Display shows several benefits in an interactive or novel format
Social Component	Study covers a small area of town or several specific points	Study is city wide in scope and involves input from city officials

RESOURCES

Encitra is a sponsor and helps with computer time

SUBMISSION REQUIREMENTS

Project write up:

- Executive summary
- Marketing proposal
- Proposal of continuation
- Correspondences with government, faculty, administration...etc.
- Appendix: engineering specification
- Appendix: Budget / financial / fund raising information

Other submissions:

- Video

SUBMISSION EVALUATION CRITERIA

Advanced Contribution:

- Level of multidisciplinary collaboration
- Engagement in each of the four components (technical, civic, artistic and societal)
- Level of creativity and innovation, both in progress and outcome
- Level of realism

Limited Contribution:

- Level of engagement in one of the four components (technical, civic, artistic and societal)
- Level of creativity and innovation
- Level of realism

JURY

Rod Diridon
Christer Lindstrom
Ron Swenson
Marcus Svensson
Debbie Cook
David Muyres

TIMELINE

- November 2012: Make pitch to city government
- May 2013: finish by ??graduation date??

CONTACT DETAILS

For additional information, visit <http://www.inist.org/challenge>. For questions. email studentchallenge@inist.org. The INIST Student Challenge can also be found on Facebook.

SUBMISSION FORM

To be enclosed in a sealed envelope. All entries must be received by May 30, 2013 at 12pm PST. All information below must be complete in order to be considered an official submission.

Please chose category of submission

Advanced ()

Limited ()

Title of Submission:

Name of Students:

Team Name:

School/University Affiliation:

Degree Program:

Anticipated Year of Graduation:

Name of Mentor/Advisor:

Mentor/Advisor email:

Mentor/Advisor Current Address:

Contact Information for notification in the event of awarded best team:

Cell Phone Number(s):