PACE

Partners for the Advancement of Collaborative Engineering Education

2016 PACE RSMS Physical Competition

Competition Date: Tuesday, July 26, 2016
Competition Location: University of Cincinnati, 2016 PACE Annual Forum

Competition Information/Description for RSMS Teams:

At the 2016 PACE Forum, each RSMS team is expected to demonstrate the reconfigure-ability and share-ability of their RSMS model. This event will take place the morning of Tuesday, July 26th on the University of Cincinnati campus. Each team will set-up their model in a designated display area, where they will demonstrate their model for the PACE judges and delegates.

During the event, groups of PACE judges and other conference attendees will visit each team's designated area. Each team will have the attention of each group of judges for 15 minutes to demonstrate their model. During your 15 minutes with each judging group, your team should:

- Introduce the demonstration (2-3 minutes)
- Take the model through the different states while you narrate or explain the transitions
- Answer questions from the judges

Your team will repeat the same 15 minute demonstration continually during the event for each group of judges and visitors that stops at your area. We recommend each team prepare and rehearse their demonstration and be able to repeat it consistently.

The judges will consider the following for the physical competition event:

Models: As per the project brief, each RSMS team is expected to "*build a physical static model of sufficient scale to demonstrate the reconfigurability and shareability, including visual diagrams that describe these functions*."

- Each team is to build a physical scale model of appropriate size to best demonstrate their design to the judges.
- Teams may use more than one physical model if needed to demonstrate different aspects of reconfigurability and shareability.
- Experience from past competitions is that a larger model is not necessarily better to win the competition.
  - For example, the E-7 Trike PAMD team, which won the 2014 Road-Test Competition in Torino, Italy, used a small model to demonstrate the functionality very well at the 1st-year competition in Pasadena in 2013.
  - A smaller functional scale model that works well to demonstrate the solution is preferred to a larger or full-size model that does not integrate moveable features well.
  - Your team needs to decide what is the appropriate size for your model. Choose a size that is convincing to demonstrate the functionality.

Poster: Each RSMS team is expected to bring a poster as part of their display. The required dimensions will be provided by June 1st.

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Target Market:

- The judges will ask questions based on the market you chose and the solution requirements identified for that specific market.
- For example, if your RSMS solution requires parts that must be attached, detached, or stored, the judges may ask where your customers would store those parts, such as in their garage or other locations (i.e., home, a shared hub, etc.).

Share-ability:

The advent of sharing communities and services is upon us. The judges will evaluate your RSMS vehicle based on emerging factors of successful shared products. General Motors Market Research has identified several considerations in a sharing economy. They are attached in Appendix A for your benefit. Use this reference material to decide what measures of share-ability matter most to your chosen market. Then during your presentations, highlight these characteristics so that the judges can assess how well you did in addressing the market need. As with all emerging markets, the exact measures of success are quickly changing. We want to understand your market assessment, the measures you chose, the decisions you made, and ultimately why your RSMS is a perfect match for the market. Consider the following points to start with, then expand upon them based on your market:

- Time Rules: *Paying for My Use*. I'm paying by time – Every minute counts, don't waste it.
- The Right Tool: *It's a Match*. The trip or task determines the kind of vehicle I need.
- I'm OK: *Safety and Security*. I trust the vehicle to protect me and my passengers.
- Neighborly: *Sharing Responsibility*. I am considerate of others who use this vehicle and others are considerate of me. We are all part of a community.
- Upkeep: *Ready to Go*. The vehicle is well maintained and ready for me to use.
- Good Housekeeping: *Clean to Go*. I'm OK with my mess but NOT with someone else's.
- No Loss: *Cargo and Stuff*. No need to worry about losing my stuff or someone stealing it.
- Close Enough: *Route and Distance*. The vehicle is parked in a safe area and my route to it is safe.

Teams may also want to consider:

- What are your strategies to manage the increased load cycles related to shared use?
- How did you address driver customization?
- What provisions do you have for cleanliness, durability, odor resistance, serviceability, etc.

Re-configurability Demonstration:

- Each team needs to demonstrate physically the transition between at least two modes/states (i.e., from 2-person mode to expanded mode, and back to 2-person mode). Your team chooses the two states to demonstrate.
- How the vehicle transitions from one state to the other should be visually obvious to the judges.

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- Teams may choose to demonstrate additional states, if they so choose.
- Your demonstration should have transition mechanisms as intended for the final product. If your design uses an automatic system for the transition, show us a functional scale model. If it uses a manual system, use a scaled human figure to demonstrate the operator can reach and manipulate the mechanism for the transition.
- Be creative in how you demonstrate the transition. We provide the basic, general guidelines here, and leave it up to your creativity to demonstrate the functionality in an effective way. As per the project brief, "*For this project students are encouraged to freely express as much creativity and conceptual innovation as possible as they create transformative and inspiring visions for the future.*"
- Minimize the time and the steps to change the vehicle from one state to the other.
- What instructions do consumers need to use your vehicle? How are the instructions integrated into the act of using the vehicle?

Measure of Capacity/Volume: Your demonstration should visually show the change in capacity/volume for each state. Your final report should include a measure of the capacity/volume of each state. For example, what is the volume of your vehicle in the 2-person state, and in the expanded state?

Measure of Ease of Ingress and Egress: As you demonstrate the transition from one state to another state for the judges, your demonstration should show the ease of ingress (entry) and egress (exit) for each state.

Measure of Ease of Transition: How many people are needed to make the transition from one state to another? The number of people needed to the transformation should be practical and make sense. For example, the number of people needed to complete the transition should correlate to the number of people of the state to which it is transitioning. For example, if 3 people are needed to transform it from a cargo state to the 2-person state, how does a father with a small child make that transition?

Other Measures: Show us any other measures that highlight your innovations in your design, especially as related to re-configurability and share-ability.

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Appendix A

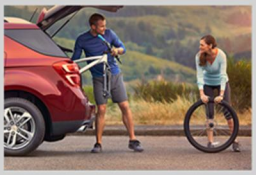
Shareability Themes

TIME RULES:
Paying For My Use

I'm paying by time – Every minute counts, don't waste it.


THE RIGHT TOOL:
It's A Match

The trip or task determines the kind of vehicle I need.

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NEIGHBORLY:
Sharing Responsibility

I am considerate of others who use this vehicle and others are considerate of me. We are all part of a community.


UPKEEP:
Ready To Go

The vehicle is well maintained and ready for me to use.



GOOD HOUSEKEEPING:
Clean To Go

I'm OK with my mess but NOT with someone else's.



NO LOSS:
Cargo And Stuff

No need to worry about losing my stuff or someone stealing it.


CLOSE ENOUGH:
Route And Distance

The vehicle is parked in a safe area and my route to it is safe.