Stanford students' new electric car breaks the mold, not the bank (w/ Video)

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Team member and grad student Karen Shakespear takes the Weng out for a spin around campus.

(PhysOrg.com) -- An electric car that's both fun to ride and easy to afford? Stanford graduate students have designed and built a vehicle that makes daily travel eco-friendly and fun. They hope the Weng will change the way people think about getting around town.

Meet the Weng, an open-air electric vehicle created by Stanford graduate students. Short for "Where everyone needs to go," the Weng is designed for local transportation with a style that gets people interacting with the community while they drive.

It's the antidote to the fully enclosed automobile. "I think it'll make neighborhoods feel a lot more friendly if everyone isn't enclosed in those

steel cans," said Karen Shakespear, one of the students on the project.

Shakespear and her fellow grad students created the car to fulfill the master's thesis project requirement for the Joint Program in Design, a collaborative program between the departments of Mechanical Engineering and Art and Art History. The program's goal is to produce designers who can synthesize technology and aesthetics in the service of human needs.

John Stanfield and David Goligorsky came up with the idea to build a vehicle late in the Winter 2010 quarter. Fellow grad students Brian Ng, Shakespear, and Andrew Murphy joined Stanfield and Goligorsky to form the core team and develop the idea. "Paul Karplus found out about the project in the last phase of the build and quickly became a critical part of the project's execution," Goligorsky said.

In just one academic quarter, the team conceived the design, drew up the blueprints, gathered materials, found discounted and donated parts, and assembled the vehicle. Plans are in the works to market the car in the near future.

"People are more accepting of owning electric vehicles these days," said Goligorsky. "The proverbial road is paved for electric vehicles and we're interested in how people change the nature of car ownership as they become more environmentally aware."

It's eco-friendly and turn heads

Goligorsky says most daily errands and commutes are less than 30 miles on roads with speed limits of only 35 miles per hour.

"Why use a 200-horsepower car to go to the grocery store on roads you can only go 35 miles per hour on anyway?" said Goligorsky.

The Weng would be an environmentally friendly alternative that the team thinks could become the cool way to go to the grocery store, get the kids from school and even go to work.

"We want people to buy into the culture and image of an eco-friendly neighborhood vehicle," said Shakespear. "It's not just about the technology or functionality, it's an image, too."

The car is completely open to the air. A frame made of tubular steel sits on four wheels. Two leather-covered seats on the wooden floor are each long enough to sit two people motorcycle style. Passengers hold onto bicycle-like handlebars; the driver's side has a steering joystick and throttle.

The car's mechanics are simple and transparent. Almost all the moving parts are visible and include the motors, which are in the car's rear wheels, the throttle, speed control, batteries and brakes. There are fewer parts to wear out than on a traditional car, and the Weng will be easier and less expensive to work on, maintain and update.

"You want to make it go faster or have more power, you just change out the back wheels," said Stanfield. "It's really easy - just two bolts and a couple wires and you're done."

The Weng is efficient, too. Like several hybrid cars on the market, it has regenerative braking that recharges the batteries while slowing down the car. When braking, rather than the electric motors turning the wheels, the wheels turn the motors, creating an electric current to recharge the battery.

Zooming forward

This first version of the car takes four hours to charge and can go about

10 miles at 15 to 20 mph. But an optimized system with the best batteries and appropriate motors available today could go 30 miles at 35 mph.

The basic design is customizable. Motor speed, frame color and size all could vary depending on the customer's needs. It also would be possible to add a convertible roof to shield passengers from the rain.

The team is working with second-year MBA student Graeme Waitzkin to look at the product from a business perspective. He thinks the car could be marketed as a shared or leased vehicle. It would cost from $5,000 to about $10,000; more than a golf cart, less than an electric automobile.

"This project makes electric vehicles cool and affordable so they're accessible to a wide range of people," said Waitzkin. "We want to hone in on a local transportation need that is poorly served by today's technologies."

The team got enthusiastic support from Sven Beiker, executive director of the Center for Automotive Research at Stanford, who was able to provide some funds and good advice.

"They really understood how to combine efficiency, practicality and appeal in a very nice design," said Beiker. "It's easy to use, fun to drive, looks gorgeous and it's efficient. This is what a modern vehicle needs to be."

More information: The students will demonstrate the Weng and welcome feedback at a launch party on Friday, June 4, at 6 p.m. in the atrium of Stanford's Hasso Plattner Institute of Design, familiarly known as the d.school. The event is free and open to the public.

Provided by Stanford University