CITY CAR

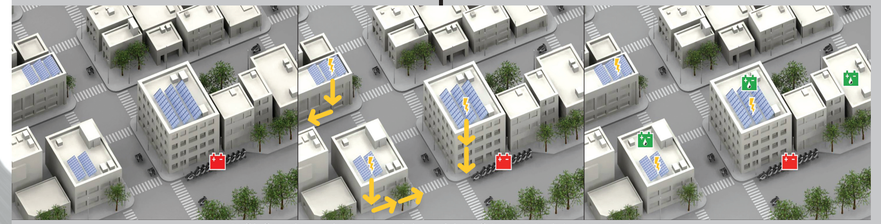
Reinventing Personal Urban Transportation

If you combine the economy of car sharing with the environmental friendliness of an electric vehicle—and then add a really cool design that allows the car to fold and stack like supermarket shopping carts at convenient locations—you have the innovative City Car, now being developed at the MIT Media Lab.

City Car components

Images: Franco Vairani

City Car turning 360 degrees



The City Car system inserts a large amount of battery capacity into the urban electrical grid. This allows utilization of inexpensive off-peak power to charge batteries, and effective utilization of clean but intermittent power sources such as solar power and wind power. Transmission losses can be reduced by integrating these sources with buildings, turning the entire city into a virtual power plant.

Pictured: Solar panels (center) and hydrogen fuel cells (represented in green, right) within buildings can provide energy for the City Cars stacked below (represented in red).

Images: Franco Vairani

To learn more about the work of the Smart Cities group, visit http://cities.media.mit.edu

The idea is a revolutionary one. Not only will the City Car be a shared vehicle that can be picked up and dropped off at convenient urban locations—like bus stops or train stations—but it will also incorporate a totally new way of thinking about how to build a car: all the essential mechanical systems will be housed in the car's wheels.

This pathbreaking initiative is the brainchild of the Lab's Smart Cities research group, led by William J. Mitchell, the former dean of MIT's School of Architecture and Planning, and includes students with backgrounds ranging from architecture, to aeronautics, to visual arts.

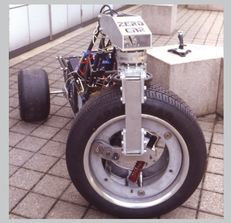
"We are basically rethinking the car as we know it," says NEXT Fellow Ryan Chin, a PhD candidate who is the project coordinator. "For starters, there is no engine, at least in the traditional sense. The power comes from devices called Wheel Robots, which are self-contained, digitally controlled robotic wheels, complete with their own suspension and very simple connections to the car body."

This design eliminates the need for traditional drivetrain configurations like engine blocks, gearboxes, differentials, or even a steering wheel. Plus it allows for extraordinary maneuverability: the wheels can turn a full 360 degrees, making it a lot easier to park in really tight urban spaces.

"The car's tiny size and agility allow much more efficient use of scarce road, street, and parking space," says Mitchell. "It is very lightweight, all electric, digitally controlled, almost silent, and pollution free. It will be equipped with computer screens that replace the traditional dashboard with sophisticated urban search and navigation capabilities, while mechanical information is mostly sent to the system operator."

The proposed scenario is simple: you merely swipe your credit card, roll out the front car in the stack, and drive off. It's like having valet parking or a waiting taxi wherever you want it, with the added advantage that the vehicles recharge while parked in the stacks.

Mitchell and Chin emphasize that this project goes beyond thinking of City Cars as just small-footprint vehicles that can squeeze into tight spaces. "The idea," says Chin, "is to have the vehicle work in unison with its urban surroundings, taking advantage of existing infrastructure, such as subway and bus lines. Ultimately we see this as an effective way to merge mass transit with individualized mobility, creating a new urban transportation ecosystem."



A prototype for the self-contained, digitally controlled Wheel Robot that can turn a full 360 degrees.

The Wheel Robot with various design models.

Team members (left to right): Raul-David Poblano, William Lark, Jr., Polychronis Ypodimatopoulos, and Ryan Chin. Photos: Webb Chappell

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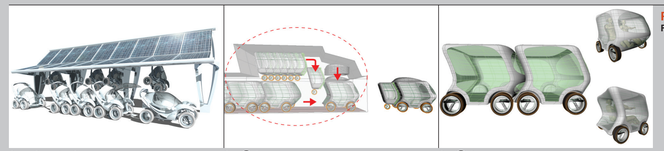

Solar Collector Stack | Car Ⓣ Dispenser | Car Ⓣ Dispenser

Project Collaborator
Franco Vairani

A chronological history (from right to left) leading up to the current City Car design.

Stackable City Car | K3 Car | Flex Car | Slider Car | Shoe Car | Omni-Pup Car | Omni Car | Turtle Car | "Axel" Car | Mr. Potatohead Car

Images: Mitchell Joachim, William Lark, Jr., Marcel Botha, Raul-David Poblano, Axel Kilian, Andres Sevtsuk