DESIGNING A DRIVERLESS WORLD

The Future is Now!

In 2013, those who predict such things said that driverless cars would be selling to consumers by 2025. Now, those same experts are saying they will be available by 2020.

And John Eddy, principal at Arup, a San Francisco planning, engineering and consulting firm http://www.arup.com, says he expects—and he thinks he's being a little conservative—that you will be able to buy a car that drives itself by 2018.

But you probably won't *buy* one, since individual ownership is likely to make way to shared vehicles, once driverless cars become common.

Eddy's presentation on April 30 at the Science Museum of Minnesota was the first event in a collaboration by the Science Museum and ULI Minnesota as part of a Great Cities Initiative that is expected to lead to a traveling exhibition. Eddy's visit to Minnesota was sponsored by Blue Cross Blue Shield Minnesota and SRF, as well as Arup, the Science Museum and ULI Minnesota.

Eddy painted a picture of a world in which you would summon a vehicle when you need one and it would arrive a short time later. It may have been sitting quietly on the edge of a freeway overnight, with thousands of other driverless cars, or it may have just finished a trip for someone a short distance away. You'd climb in, tell the car where you wanted to go and it would begin your trip. While the car hummed along, its advanced sensing systems coordinating its movement with that of other vehicles on the road and avoiding hazards, you could nap, read, work on your laptop or sightsee. When you got to your destination, you'd exit the vehicle and it would take off for its next use.

No losing time while looking for a parking space, no meters to feed. And no car insurance, repairs or maintenance, no vehicle tax—not to mention no purchase cost in the first place. You likely would pay a provider for a membership, then pay per mile for your use of the vehicle.

The idea of a driverless car is interesting and exciting in itself, but Eddy pointed out some of the many ways the urban environment will change to accommodate a very different mode of transportation, from reducing or eliminating the need for parking structures and spaces (a driverless car would come to you when you need it; you wouldn't have to "store" it nearby) to eliminating the need for expanding or increasing highways (highways could accommodate 3.7 more vehicles if they were all driverless) to changing the design of commercial buildings.

"Gone are traffic jams," said Eddy. "Gone is congestion."

A driverless world would mean:

- Mobility as a service. "If you had a driverless car, you'd probably lend it. So why would you own one?"
- A smaller fleet.
- Major wireless infrastructure. The cars need to communicate with each other, with their passengers and with the environment, which means wireless.
- Dynamic traffic control.

Eddy began looking into driverless vehicles and what they might mean several years ago. He was a passenger in Google's driverless vehicle a couple of years ago. That same evening, he had his first accident in 35 years in his own Honda Accord, resulting in $15,000 in damage to a $30,000 car. It made a vehicle that would automatically avoid accidents look pretty good.

Google started with a Prius and adapted it for use without a driver, then did the same thing with a Lexus but, Eddy said, Google realized that it was better to build the vehicle from the ground up than to retrofit an existing vehicle. https://www.youtube.com/watch?v=CqSDWoAhvLU

Many of the results of driverless vehicles taking over the roads are positive:

- More people will have customized mobility.
- Traffic may be able to move through cities without the kind of highways that have created barriers between neighborhoods over the last decades.
- Urban roads would need less space, so cities might regain 12 to 14 feet of space now devoted to road surface. In San Francisco, for example, streets now take up 25 percent of the city's land area. That percentage could be significantly reduced with driverless cars operating in a coordinated way.
- The cost of driving, per mile, would drop.
- Driverless vans and buses would be less expensive and the sizes could vary depending on the time of day, the route, the trip. "Imagine a mini-van with six compartments, with a cost a tenth of what it is now," Eddy said.

Other than an extended and efficient wi-fi system, Eddy said the current system of roads and highways would not need to be changed to accommodate a fleet of driverless vehicles.

But not all consequences would be good ones:

- Jobs would be lost. "A lot of people would be out of a job, no question," said Eddy. "There are a lot of jobs that involve sitting behind a wheel, and a lot of jobs that involve making things for vehicles." Ultimately, jobs like that of truck driver would disappear.
- Driverless cars might allow people to live further from where they work, increasing the possibility of housing sprawl.
- Cities would lose parking revenue.
- Neighborhood streets are likely to be busier.
- A driverless fleet may be a disincentive to investment in the capital cost of public transportation on permanent rails, even though, Eddy said, "The energy efficiency of moving a lot of people on steel rails is hard to beat."

A number of people in the Science Museum audience asked about the transition period, when driverless cars first become available but cars with human drivers are still on the road. Eddy said he looks at it as "putting a lot of good drivers on the road," which would be far from the chaos that one questioner suggested. At some point, he said, "You could start having areas where no manual cars are allowed, and that area would spread and spread."

Eddy said it will take about 20 years from the first commercially available driverless vehicles to turning the fleet over—and that may be faster if a system of driverless vehicles cuts the per-mile cost of driving to one quarter of what it is now. "It comes down to the economics."

What if Americans aren't willing to give up the idea of a personal vehicle? Eddy said the worst case scenario is: "You own your own car at the same price as you pay today, but you have a lot more time to do something else" while it takes you to where you want to go.

For more information:

See John Eddy's Presentation

or

Listen to the full presentation