New Mobility Trends Conference

Notes By John Hoard
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Summary

The US model of widespread suburbs with individual cars is somewhere between impractical and impossible in many parts of the world. It may not even be sustainable in the US for long. What better solutions can be developed and how can we get there?

This conference was to discuss these kinds of questions. It was organized by UM’s Transportation Research Institute (UMTRI).

We need to change transportation due to climate change, congestion, and air quality. But also, we can change and we want to. Technology is happening faster than policy.


Society needs multi modes – bikes, walking, driving, etc. Mobility for the elderly is about human progress and quality of life. Car sharing or transport on demand is coming.

More than a million people die on the roads each year now. Future automated vehicles can reduce that toll.

Solutions for improved mobility may be different in places like India than in places like the US.

Welcome

Bruce Belzowski, UMTRI
The Automotive Futures group – conferences, research on globalization, IT, powertrains. Affiliates.

What are governments doing to support new mobility?
What business models?
Small companies scale up?
How do agencies support new mobility businesses?
What will new mobility do for sustainability?
What advantages will consumers see?
Where are we in the evolution of mobility?

Transportation is nearly 10% of US GDP. Each country has its own footprint: US mainly pass car. Non-OECD countries much more heavily busses and rail. Latin America, busses and mini-busses.

Susan Zielinski, UM-SMART, UMTRI

SMART = sustainable mobility and accessibility research and transformation.

Transportation is at a tipping point. New mobility is a catalytic force. This can feel disruptive!
- Lifestyles, aspirations
- Sustainability
- Mobility divide
- Driving global industry opportunity

New Mobility:
- Moving people, goods,
- Moving less
- Meet evolving needs
- Cleaner, greener
- Multi modal

Some countries are monomodal – cars or feet. Others are multimodal, and modes don’t always get along together. There are many options and possibilities.

There is a similarity to computers – originally big central systems, now more distributed.

There are a lot of related technologies
- Services like Zipcar
- Technology
- Product design

We need to change due to
- Climate change
- Congestion
- Air quality

But also, we can change and we want to.

New mobility is an economic driver
- Job creation
- Regional competitiveness
- Money saver
- Emerging multi-billion dollar industry

Recently Ford announced experiments beyond just vehicles.

Related trends:
- Urbanization
- We don’t know what we don’t know
• An infinite game and renewable market. Today’s solutions may not work for the future.

We need to get together – industry, research, governments. Technology is happening faster than policy.

**Kerry Duggan, Department of Energy (DOE) Liaison to City of Detroit**

DOE’s Energy Efficiency and Renewable Energy (EERE) has recent accomplishments in
• Sustainable transportation
• Electricity generation
• Home and business energy efficiency

With the Mayor of Detroit, we have been providing technology assistance to the City. Public lighting is one example; LED lights have cost savings and carbon reduction together. There are a number of other DOE technologies that can be deployed, including some new mobility items.

EERE has a Sustainable Transportation office. This came out of comments from the confirmation process for the Energy Secretary. Often technology is ahead of policy, but we are working to close that gap.

EERE budget has been growing to help accelerate these technologies and their deployment.

A slide shows FY16 EERE transportation spending plan. Slides are available – too much to read real time.

EERE also has a loan authority for deployment of new technologies in the US. Up to $40B in loans can be available. There has been only a 2% failure rate in this program to date.

ARPA-E office of DOE pursues higher risk, larger payback technologies.

**Eric Wingfield, Mobility Strategist, Ford**

Henry Ford was very proud of contributing to society by making life better for the middle class.

Mobility is new to people when it first arrives; they have to learn it. It changes lives in fundamental and simple forms. It causes social transitions

As urbanization and connectivity increases, people are learning new ways.

We continue to look at innovation. Collision avoidance, information for safer and faster travel. We are a mobility company and also a product company.

Society needs multi modes – bikes, walking, driving, etc.

Mobility for the elderly is about human progress and quality of life.

The consumer experience is changing. Four trends:
• Urbanization. Mega-cities are huge. Challenges to mobility and quality of life. All cities are experiencing mobility change. Adding more cars can lead to global gridlock – wasting time, energy, resources. How do ambulances arrive on time. Many issues arise.

• Global growth of the middle class. Middle class will double in size by 2040. That is great, but also presents challenges. Historically, as people become middle class they want cars.

• Air Quality is an important issue in many places.

• Changing consumer attitudes. Later marriage, fewer housing purchases, other changes. 47% of people use a smart phone to plan their transportation. 39% travel daily by bus, train, or taxi so they can do other things while traveling. 34% of people would be interested in renting their cars to strangers.

Ford is looking at smart mobility as part of our plan for the future. Blueprint for mobility is a multi-decade vision.

• Vehicle to vehicle communication
• Vehicle to infrastructure communication
• Vehicle sharing

We plan three enablers

• Connectivity. We already have 10 million vehicles on the road with Sync globally. Many consumers can’t go 24 hours without checking their phone. 80% of the world population has or will soon have a smart phone access. They are everywhere.

• Software and sensor technology.
• Active park assist – semi-autonomous
• Automatic cruise control in traffic
• Big, smart data. This is a big opportunity. The customer’s data is the customer’s; we will be transparent in how we use the data.

We are conducting 25 experiments. 14 are traditional research, 11 are open challenges. Ford is global, and customer conditions vary around the world, so the experiments are global. Some are described below. Better customer experience, flexible usership models, communication.

In Dearborn we will have up to 500 vehicles on the road that communicate. You could have your entire driving history in a database. We want to work with customers, insurance companies and others to learn how to use data like that.

Car sharing is an opportunity. City cars on demand in London is one program. Half the fleet is electric. City traffic charges etc. included. Customers are interested in this when they think it makes their city better.

Dynamic social shuttle is another. Your phone can call a shuttle, you ride to your destination. Small busses, well designed, can be lower cost than a taxi. You have to provide a comfortable level of personal space. Effortless access is important. Driver registration and rating adds to customer feeling of security.

Social collaboration is another set of experiments. Data driven health care. In parts of Africa, lack of mobility has limited access to health care. We make vehicles available with good up-time. We will make their fleet more efficient, and use diagnostic data to reduce downtime. In many cases, roads have not been well mapped; our vehicle history data will provide mapping data.

Another is Parking Spotter. We have radar and other sensors already on the car. They can also be used to identify open parking space info; this can be sent to the cloud to help others find parking. The experiment is in Atlanta.
We are not just cars – also busses and multi mode transportation. A device on a bicycle can gather data – where do bikes go, how to they get there. Helps to improve safety and mobility.

**Chris Thomas, Fontilanis**

Five years ago mobility was not a topic of research. Our company includes Bill Ford and others and provides a venture capital perspective in the mobility space. We have invested in companies and they are growing. This presentation will present our view.

We need a leap in thinking to create a viable future. Previous examples of need response are railroads for the westward expansion, and interstate highways after WW-II. What is the next leap?

We are based in Detroit. 14 investments to date. We are more than investors, we are value-added strategic partners. Focus is next-generation mobility – superior movement of people, goods and services. Systemic mobility.

Constant connectivity, optimized movement, flexible payment. The challenge is large, so the opportunity is large.

Today we have disconnected systems. We need to fix transit to avoid issues like the recent news story of the walker who spent hours getting to work.

Current problems will only get worse as population grows and urbanization increases. If we had all the money we want we could solve issues, but we have to do it economically.

What are the new technologies? Enterprise software, personal mobility. Smart logistics. Global payments. 14 companies invested in so far – see slide.

- Life360 uses smart phone to take you to the person you want. 50 million registered families. Web app connects with Ford Sync to reduce texting while driving.
- ParkMe – parking data and availability
- Masabi – real time payment on bus by smart phone. No lines, no bus waiting.
- Paymobile – pay for parking by phone
- RelayRides – pure car sharing – personal rental
- SmartKargo – optimize cargo on each trip based on passenger, fuel and cargo weight
- Synovia – school bus tracking, routing
- Telogis – long haul fleet tracking for route efficiency

Flexible mobility is the future. Book a car with your phone, unlock it when you get there. Navigate to your destination, including traffic notification. Buy train ticket in real time. Bike sharing for the “last mile”. This is available today.

Next generation mobility is multi-faceted and interconnected.

Fortinalis.com/newsletter web site for latest mobility info.

**Jean Redfield, NEXTEnergy**
We are an accelerator of advanced energy technology. Public-private partnership with funds from state and federal agencies, industry, and philanthropy – Ford, GM, Daimler, Bosch, and others. DOE, DOT, EPA, NIST, NSF. Collaborations with several universities and national labs. We work with about 100 startups per year.

Provide services, host demo and commercialization programs at NextEnergy Center. Provide input to policy.

Our services include
- Business consulting
- Tech vetting
- Access to funding – advising, matchmaking
- Market research, promotional support
- R&D demonstration
- Testing services
- Incubation space

Our center is 2.8 acres, 45K square feet of lab in Detroit. Advanced energy infrastructure, conference space, company incubation.

Our definition of new mobility is a system of systems. It is not about the device, but about the context of transportation and infrastructure even including building technology. Software solutions and business models are part of it. Mobility allows people and information to move. Higher customer satisfaction, lower cost. Value = time/money/ease of use, access, safety.

Electric grid, cyber security are issues. Distributed solutions. Traditional grids have large, monopoly power generators; this will change in the future.

The mobility ecosystem in SE Michigan includes UM’s vehicle programs, highways, rail lines, shipping ports, international border crossing, airports, and many more. Thinking as an ecosystem helps us move new ideas from research labs to deployment readiness. The region is ideal for this function – even includes four seasons for proper testing.

Recent initiatives:
- Micro grid tech including communication, energy storage, electronics.
- Vehicle to infrastructure – electrification, smart charge, connected vehicle
- Distributed generation and energy storage – advanced batteries, community energy storage, PV solar
- Smart building tech – lighting, controls, sensors, communication

Corey Clothier, Comet

More than a million people die on the roads each year now. Future automated vehicles can reduce that toll. There are safety concerns around autonomous vehicles, but there is promise of big improvement.

Comet is a consulting company. Applied robotics. Starting to test automated vehicles, starting in simple operations. We work with TARDEC and UM. Low speed automated electric vehicles. Even these can have large impact.
Programs on several campuses around the country. One is Tampa Museum of Science and Industry shuttle. This will gradually expand to automated busses on public streets.

Eventually these little shuttles will be integrated with the rest of the transport infrastructure.

**Ansgar Strother, A2B Bikeshare**

Why isn’t bike sharing everywhere? Traditional kiosk based systems are very expensive – around $4K per bike initial investment. We went from smart rack/dumb bike to smart bike/dumb rack. The dumb rack idea worked.

Our system allows you to use your smart phone and Bluetooth. We should be under $1K per bike, so bike sharing becomes much more affordable.

Bike sharing is growing rapidly around the world, even with the current expensive cost.

Our business model is to develop the hardware and software. We don’t actually operate the bikes. We partner with the operators.

**Ody Norkin, Michigan Flyer**

We operate busses to and from DTW, Lansing, Ann Arbor. About 450 passengers per day, 98% on time. Our competition is the personal automobile. Our parent company, Indian Trails, provides bus transportation across the state.

Michigan is very low in terms of intercity transportation (bus, train) other than cars on highways.

We try to be innovative. EPA “near zero emission” engines. No operating subsidies. State of the art reservation system, mobile responsive. Free Wi-Fi, bottled water, electrical outlets, comfortable seating.

Riders choose us because
- Savings
- Safety, convenience
- Energy conservation and environment
- Stay productive (Wi-Fi etc)

Challenges
- Expand business model to more areas. Public/private partnerships?
- DTW has no public transport – rail, subway, etc. Negative impact to disabled and seniors.
- Need long term parking at low cost

Parking lots at DTW collect $130M per year; officials see the Michigan Flyer as a risk to that income. We would like to expand to Toledo and other places. There are competing interests that do not want to see us operate.

**Morning Q&A**

Questions directed to morning speakers.
What must Ford change internally to adjust to a new mobility model?
The future includes many exciting things. The pace of the digital experience puts tension in a company with a 5 year development process. Aligning product cycle with IT developments is an exciting dynamic.

Large companies need to take actions to respond to disruptions so they can be leaders in the new environment. Ones that don’t fade away.

In the long term, personally owned automobiles will become a niche market.

How does the government avoid picking losers and winners (question to DOE)?
Almost all DOE grants are competitive. We are very sensitive to be merit based.

Several trends were discussed – urbanization, consumer attitudes. What are the implications of an aging population?
This is often overlooked. People will need mobility solutions to maintain their quality of life. We see a shift from a pure technology focus to the along with human behavior.

The aging population question is one where convergence of mobility and land use. Our model of suburbs has become ghettos for aging people.

There are pilot projects for elderly in retirement communities in Florida.

30% of the airport bus riders are 80 or over.

How does infrastructure cost of bike sharing work in cold climates like Michigan?
Most bike sharing systems stop in winter. Salt/rust damages the bikes.

You need bike lanes to make it work.

Our first major city will be Fairbanks

If transportation is at a tipping point, what is it tipping to? How long will it take? Will personal ownership of cars change?
I think the tipping point in transport has already passed. There are trillion dollar industries.

Transport is not the same as it used to be. Uber and apps are already reality.

How will auto manufacturers work? We’re looking at usership models. Many companies are asking these questions.

During the Nasser area, Ford tried to get more of the aftermarket business, but it did not work well. How will Ford do better this time?
The times are different and the approach is different.

We are asking what is mobility and how do people relate to it?

Most of the companies listed on the startup screen were software. Can they be manufacturing?
You find similarities. A software based data driven company can be successful. Some have hardware components that are also revenue/profit generators. When it comes to very capital heavy manufacturing
we do not look there for investment. We work with people like Ford who have that already. SE Michigan is a good place to do such things.

*What are the business model issues of the automated vehicle work?*

Every pilot has to have a good business case. There is a massive market for low speed automated vehicles such as we do. Crowded inner cities, airports, campuses, etc. We are very concerned about the potential safety issues and have to develop technical solutions. The low speed environment is much easier.

*Are there different challenges for new mobility than for other businesses you have worked with?*

There are the same challenge, but perhaps bigger for mobility. How do you deploy when the incumbent system is mature and well developed? How do you level the playing field? What is the security protocol? Many such questions don’t have someone obviously in charge of the decisions. The US lags much of the world in policy. Our policy is inclusive, with little expectation of a real result.

DOE is making investments in batteries, alt fuels, engines. There is some wiggle room for other technologies. Where do we need added investment? We are trying to assist development of needed technologies and policies.

In the Detroit area, there is not a functioning incumbent public transit. This is an opportunity for improved solutions.

*For connected vehicles, infrastructure support is needed. Will the government really support the infrastructure needed, or does each vehicle have to carry the entire work load separately?*

Some manufacturers are not waiting for government to put infrastructure in place.

You also have to have legal authority to operate automated vehicles. You have to solve the legal liability issues as well as the safety issues. Right now there has to be a driver in the autonomous vehicle.

**George Hazel, Scottish Smart Mobility**

This effort is a national initiative by Scotland.

Scotland is the partner for Tier 1 value chain; open innovation partnership in mobility R&D. We put industries together with universities and funders. The vision is that Scotland should be the location of choice for demonstrating the value of smart mobility products and services. 5 million people, 7 cities, many rural areas.

We want to build the capabilities in Scotland and attract global companies in a living lab. Form strategic partnerships around the world. 250-500 pounds sterling per year by 2020 opportunity.

There are not many places that get it.

A slide shows global trends leading to core mobility needs: User focused, seamless, value.

There is already a lot of capability in Scotland. See slide.

Potential output:
- Generates new markets and profits
- New funding streams
Future mobility is driven by finding and capturing customer value.

Toronto transit commission tried an experiment and gave air miles when you bought transit tickets. 57% revenue increase.

The global value chain is shown on a complex slide. There are good things that can be done together. It has to be industry driven.

Consumer spending on mobility is about 10x the spending on smart phones. This is a big market!

There is a partnership opportunity for industries. Bring part of your R&D budget to Scotland, and we will match it up to 50%.

A challenge resulted in 62 proposals, L57M from industry.

Amit Kapoor, Indian Institute for Competitiveness
Competitiveness and Urban Mobility: A Case from India

Cities that do well have a smart transportation solution. We expect competitiveness to improve prosperity.

Transportation can be important to health care. India has too many cardiac deaths: 50% of heart attacks die because traffic keeps them from getting to doctors. It can take 2 hours to cross the city. How do we solve that?

The context in the West is very different from that in the West. Solutions that work here may not work in India.

Average speed on highways in India is 30 kph, dropping to 20 kph in Delhi. This has a big effect on national prosperity.

India has growing urbanization. There will be regions with 40-50 million people. How do we move people in these situations? Walkability, cycleability? We have chaos on the roads at times with multimodal transport. Rational individual decisions can result in group irrationality. Queuing tends to fail in India while it works in England.

India has 417 people/km2 today. In Delphi or Mumbai, 20K people per km2.

In India where it is dusty and may be 50C, we need different solutions.

For economic growth you need good roads, better transport.

Transport systems need to be integrated: bus, taxi, ticketing, rail, etc. A good system of governance is needed to help support the systems.

Many slides full of info but print too small and slide too busy to understand them.
Komal Anand, Mobi Prize, UM-SMART
Crowdsource, connect, advance new mobility ideas.

Goals: Identify new business models. Honor good ideas.

The prize received many submissions. There is a web site with info on the ideas, mobi-platform.com.

Focus on technologies, service, modes, products, and infrastructure – all new mobility enterprises.

For entrepreneurs and innovators
• Network and collaborate
• Apply for prize
• Publicize

Businesses also have the opportunity to sponsor a Mobiprize. Government leaders can aces innovative talent.

There are also new mobility industry analysis project. Analyze the emerging industry. What is the role of legacy companies? Develop value systems and business models.

Models are being developed of the consumer uptake of new multimodal mobility systems.

Design prototypes have been developed for a range of concepts.

New mobility trends: co-creating with 45 billion potential users,

What has changed? Wealthy people (like us) earn >$20K per year, but this market is near saturation. There are emerging middle class, 1.7B people $2-20K per year. Many cost barriers, climate change, and other factors are critical. There is a base of 4.5B people <$2K per year purchasing power. Are there solutions for this base population?

This part of the population adds up to $5 trillion spending – many people, little per person. Higher income groups spend a larger fraction on mobility. Is this because poorer people don’t need it, or because they can’t afford it?

We look for solutions that are economically feasible and environmentally sustainable.

Paula Sorrell, MEDC
Michigan Economic Development Corporation (MEDC) is a State activity to stimulate business development. Grow and diversify Michigan economy. Create more and better jobs.

4 key areas
• University programs – create the pipeline
• Incubators
• Service providers
• Funding programs – leverage new capital

The ratio of R&D spending to VC capital is higher for Michigan than any other middle state. We want more VC investment. We have generated significant growth over the last few years.
M-TRAC tranched funds based on milestones. University focus. 16 schools have achieved >16:1 return on investment. UM Advanced Transportation. UM Med School. Others.

BBC is a company that helps young companies with SBIR and other grant proposals.

SBDC – small business development center. Assist small businesses.

Programs to help with customer acquisition. Sales training, crowd funding.

Several incubators.

Next Energy has MEDC support.

Michigan Manufacturing Tech Center. Early runs, short runs, prototyping.

MEDC works to span the “valley of death” between research and large scale production.

Program criteria: is there a need and a public benefit?

Monthly measure of new companies formed, tech jobs created, amount of follow on funding, customer satisfaction.

35 venture firms. $4B under management. State now 11th (was 24th before MEDC). 3000 companies in ecosystem. 240 new companies per year. 68 VC deals last year, a record.

There is good return on investment: state dollars have leveraged other funding sources 35:1.

Jessica Robinson, ZipCar

New Mobility Trends

Car sharing started in 1916. A guy bought a Model T in 1916. He rigged a mileage meter, rented it when he was not using it.

ZipCar started in 2000. The first one had a key hidden under a rock.

Our mission is to enable simple and responsible urban living.

We serve 470 cities and 400 college campuses, 6 countries after 15 years in business. We partner with governments and municipalities to put car sharing in government fleets. Over 30 makes and models. Some hybrids, some cargo vans, etc.

Get the convenience of having a car without the inconvenience of owning one.

Cars by the hour or day. Gas and insurance included. Round trip service: you return the car where you picked it up. We are experimenting with one way drop off service.

What is the future sustainable model? Cars are a part but only a part. Every ZipCar means 40 members have signed on. 15 personally owner vehicles have been taken off the road. Every year we take 1 B pounds of carbon out of the air.
Families who use us spend 6% of household budget on mobility versus 19% for car owners.

ZipCar is another option for urban transport.

**Yvonne LaFave, Go Green Trikes**
When sustainability is factored in, bigger is not better. In cities, a big truck doing deliveries blocks traffic. In the past, deliveries were often made by cycle.

We use tricycles with boxes. These are much smaller. Pick up loads at a shipping container, take them to destinations. Trikes are electric, charged by solar cells on the shipping container/garage.

Companies who use them for delivery obtain a green image and do not block traffic.

They are cost effective in an urban center compared to a diesel van.

UPS is experimenting with trikes; picture shown of one in Germany pilot program.

9 feet long, 600 lb capacity.

Another design is smaller and carries 350 lb including rider.

Challenges: insurance, bank financing. Opportunities: sustainable, deliveries, moving, advertising. Attracts kids!

**Lauren Flanagan, BELLE Capital and Current Motor**
Current Motor is in Ann Arbor and makes all electric cargo motorcycles. Mobile charging stations.

A standard shipping container folds out and is the charging station for 4 cycles.

After Hurricane Sandy, it was 72 hours before help could arrive. One of our containers could have been helicoptered in and used to move medical and other emergency personnel.

Many of our customers are in remote locations.

The electric motorcycle has several years of development. The business model is B2B, not consumer oriented.

We had a design contest at CCS to develop a good American look.

The design fits a shipping container; otherwise, shipping to remote locations can cost as much as the hardware cost.

Our telematics and sensor data has its own radio system.
Zero emissions (so it can go into mines and buildings)
450 lb load
Remote diagnostics
5 hour charge time, 50 miles per charge
Up to 70 mph
This started with venture capital. Under $5M – very capital efficient. Next step is to raise capital for further expansion.

**Liz Martin, Zip Express**

Based in Holland, MI. A lot of manufacturing is in Michigan. Food, agriculture, cars, trucking, furniture.

LTL freight – less than a full truck load. <5000 lb, 1250 ft³, …We do freight optimization. Several small loads to fill a truck.

Trucking is 35% of road traffic, 75% of manufactured goods are trucked.

Sustainability needs aero, tires, etc

A 10% reduction in truck fuel would save 3B gal fuel, 82 B lb CO2. We saved 79K gal of fuel with one tiny company in Holland. There is a large opportunity. Shipping costs are reduced at the same time.

There is a driver shortage now; our methods help. Average truck driver age is 50 years; many will retire soon.

Challenges: perception of trucking industry and drivers. Selling to large corporations. Driver shortage.

**PM Q&A**

*How do you make money in the winter or in hilly cities?*

It is a challenge. Bike lanes don’t get plowed. We don’t make money in the winter.

*In the long term, car sharing reduces car sales. Do you get push back?*

Yes that is true, but it is a trend that will happen anyway. We see ourselves as a partner, not a foe. Ford has a strong partnership with us on college campuses in Michigan. Also with Honda.

*What criteria does ZipCar use to identify new markets?*

Density, transit, connectivity, income, existing business, partner willingness. For instance in AA and Detroit, UM and Wayne State partnered. We like to start where there is a seed in the ground. We are now part of the Avis family and that helps us grow faster.

*In an extreme weather event like Hurricane Sandy, or in a place like Seattle with little sunshine does your solar system work?*

For emergencies, we ship them charged. There is always sunshine *(Editor note – except in Helsinki in winter...).*

*How is the Scottish government able to make mobility such a priority?*

The new First Minister is big on economic development and social activism. Environmental targets are very ambitious. Mobility is a key to all these areas. It is a huge market and Scottish Enterprise is there to encourage companies to come to Scotland. The 62 projects are spread about equally over the five pillars of mobility. A lot were small companies with big ideas – the small 5-10K projects went through normal channels. We got down to 28 or so. The door is still open to new projects.

As for University of Michigan, it fits with internationalization. The European Institute for Innovation and Tech is a big deal forming centers all over Europe. There will be 500M euro over 5 years for a
transportation center; one of the criteria is international connections. For these reasons, UM is a good link.

We were also intrigued by Bill Ford’s talk. We have talked to Ford, and also BMW and Audi and others.

*What is the spread of projects in Mobi?*
New business models are coming where two or more technologies collide or needs are met.

*Do you see differences in urbanization mobility in urban centers around the world?*
Absolutely. Some cities are looking at trams, some others. There is no one solution that works everywhere. There are low resource and higher resource regions. Connected vehicles are probably a long way away in India. Many people don’t have broadband access today.

*Are there road safety and security solutions that are smart phone based?*
There are solutions that will help health care response times. Two medicines are being provided to shops along the road; they can be given when needed while health care support arrives.

For safety and security, there is a collective irrationality on the roads. We have to get people to take less risk. In the west you have a self-driven system. In India, there is more concern about your family and loved ones rather than self.

You can have a camera or tracking device to help improve personal security in transport.

Until now, it has been hard to work with government in India. But, it makes a difference if you can work with industry and approach the government. It is less likely that government in India will initiate a policy than in the United States.

*Mobility gets difficult when it gets so crowded it is even hard to walk.*
There is a whole mosaic of solutions working together. The blend may be different in different places and cultures, but the basic components are common.

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