



**Highlights of the 2014 ITS World Congress  
for  
MOITS TECHNICAL SUBCOMMITTEE MEETING**

***By  
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# Impression of Detroit



## Where is the traffic?!

No congestion is nice, but be careful what you wish for.  
Traffic congestion is a by-product of vibrant economies!

## Michiganians have less concern on privacy?

Michigan U. got more volunteers signed up for equipping their cars for being tracked and in-vehicle cameras for being watched.



## Where is the local on People Mover?

It goes in a 2.9-mile one-way loop  
It's driverless  
It takes a 75-cent token - looks like a quarter  
It runs at an avg speed of 12.4mph  
It can be slower and less convenient than walking.



# Technology Demo from 2008 to 2014 at ITSWC

## 2008 in New York –

Vehicle to Infrastructure (eg how much green time remains)

## 2011 in Orlando –

Vehicle to Vehicle collision avoidance

## 2014 in Detroit –

Automated vehicles for driving and parking and alternate energy source

Session: Mobility – seamless from mode to mode

Exhibit hall: more new / unexpected players such as Xerox and Verizon

## Why the Conference?

**Known Knowns** — these are things we know that we know

**Known Unknowns** — these are things that we now know we don't know

But there are also **Unknown Unknowns** — there are things we don't know we don't know — Secretary of Defense Donald Rumsfeld

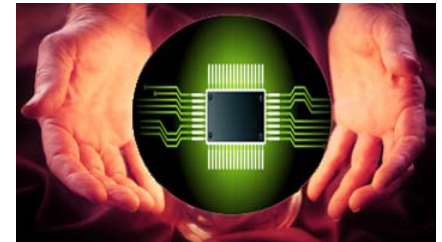
Philosopher Slavoj Žižek extrapolated to define **Unknown Knowns** — the things that we know, but are unaware of knowing

Slide Credit to: Zongwei Tao

# Crystal Ball on ITS and Operations in 2025

## According to Delphi Automotive CTO ...

- by 2025, automated driving features will be a reality
- 50% more vehicles on the road with 50% fewer accidents
- 50% less emissions, 100% better fuel economy
- 1000% more computational power in the vehicle.



## According to Global Director of Innovation of Visteon Corp...

Family of 4 will have 40 connected devices in 2020

## According to GM's CTO ...

- By 2025, partially automated to fully autonomous vehicles on the road
- 25% US cars will have V2V capability and V2P will reduce cyclist fatalities
- Virtually all vehicles sold in US will have high volume/speed connectivity ... 6G?
- Massive acceleration to create intelligent infrastructure
- Transition to automatic driving will be as important as transition from horses to horse power

# Autonomous Vehicles

## GM ECO Mary Barra revealed Cadillac's plans

- Semi-autonomous cars with Super Cruise and vehicle-to-vehicle communication in the market in 2017



## Tesla CEO Musk sees

- Fully autonomous car ready in 5 or 6 Years



## The industry experts said ...

- Autonomous cars can be deployed in 6 – 8 years.
- 75% of vehicles will be autonomous in 15 – 20 years

## What does that mean ....

- Avoid collision that drivers can't
- Cars will generate tons of data
- Drivers will focus on anything but driving?
- Not trying to replace human, but to enhance human capabilities & mobility

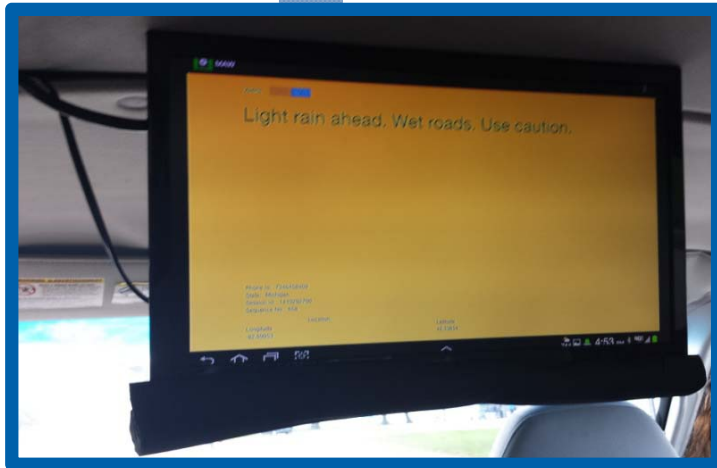


# Connected Vehicle: More Aware of Surrounding

**Simulators ... can you drive with loads of information?!  
New skills for driver's license test?**

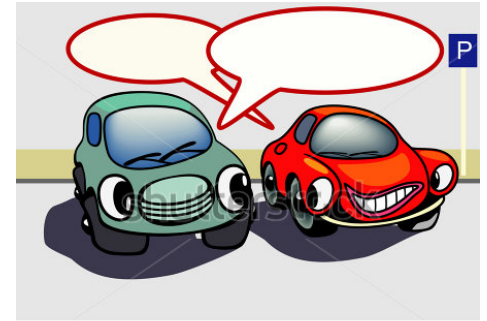


# Connected Vehicle: Connect with the Environment





## Connected Vehicle – V2X Mobility



### More “Knight Riders’ KITT” on the road that KITT can talk to you

- Cars are computers on wheels
- Drivers will view/hear the traffic advisory messages in the vehicles
- Drivers will be advised better ways than driving to reach destinations (eg park, get on a carpool or bus to ride on HOV)
- Drivers are advised the “right” driving speed in order to safely go through the intersections w/o stopping

### Cars can be routed to the less congested roads dynamically

#### 2-Way Communication: Information from the cars

- Future TOC can receive data about the traffic condition, roadway condition, individual car’s routing and status from vehicles
- But will TOC have direct communication to the drivers?



## Connected Vehicle – V2X Safety

### A collision-free society is envisioned

- Intersections will ‘like’ a vehicle for passing the intersection while alerting other vehicles to avoid collision
- Cars will receive alerts for potential head-on and rear-end collision
- Cars will receive alerts for roadway condition ahead (eg icy)
- More alerts and awareness of pedestrian, bicycle, and motorcycle and steer vehicles away automatically to avoid accidents
- Cars can “see” what drivers can’t
- But what happens when the system is down?!



### Keep cars in the lanes

- Vehicle steers back to the lane when it’s off
- Drivers receive alerts when off the lane

### Wireless towing

- A car can drive itself by following instructions beamed by the front car



# Connected Vehicle – Future TOC

## Information

- Much more information can be gathered from vehicles
- Is the TOC ready to process the data for information?

## Communications

- Operators to disseminate customized information to drivers?
- Will the future TOC be more like On Star?

## Incident Management

- Will the future Patrol target vehicles knowing the vehicle's condition?
- Will the Patrol vehicles tow cars wirelessly?



# Seamless Mobility: Trend

## Collaboration of working together

- without government's involvement (eg parking)

## Growing large urban centers

- All transportation modes are interconnected

## More mode choices

- Non-traditional transportation options

## Sharing is the new owning

## More transparent choices at the finger tips

- Take a phone and you could go anywhere

## Social Networking ...

- Gain “points” for not driving
- Earn cash reward for not driving

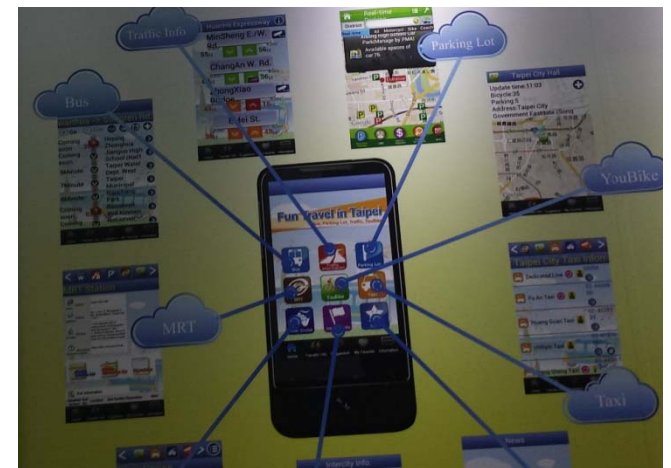


Photo of ITS Taiwan Exhibit

# Seamless Mobility: Choices

## Knowledge is power and information is liberating

- Transportation information will be at your finger tips

## More options & mix of options available

- Get a ride, Car sharing, Zipcar, Bike share, etc.

## Driving by yourself will not be your only choice

- Get a ride, not to worry about parking with affordable price (eg uber, Lyft)

## Car sharing made easy

- Find someone to carpool & use HOV lanes in real-time (eg Carma, Zimride)

## Car rental made easy

- Automate rental transactions w/o visiting the rental office (eg Zipcar, Verizon)

## Consumer's mobility choices will be transparent

- Instead of visiting several websites, one app can search and compare time and cost of possible transportation options for you
- Options can include driving, car share, car rental, taxi, transit, bus, parking... (eg RideScout, allryder)



# Smart Parking



## Parking vs. Congestion

- “30% of a city’s congestion is caused by people looking to park”
- Connected Automated Valet Parking will save drivers’ time and fit more cars into tight space

## More integrated “paid” parking management systems available

- The available parking space is readily available to drivers, payment can be made without pulling out the wallet, and car can be parked automatically
- Government knows where violators are to target enforcement
- Government has knowledge on parking usage for planning purpose

## Revolution collaboration

- Service providers (eg Ridescout) need the parking information
- Non-exclusive collaboration among parking technology providers eg: Case for space counting, Streetline / SmartParking for phone app, ParkMobile for payment, Cloud Parc for violation detection, Swarco / Xerox as integrator) is a fast revolutionary process to offer sustainable and efficient parking operations

# Recap 2014 ITS World Congress

Overview ... <http://youtu.be/C8Qqn24IW1s>

Day 1 ... <http://youtu.be/KVHL4Looiyl>

Day 2 ... <http://youtu.be/pEqRUA6NXOI>

Day 3 ... <http://youtu.be/sbdfpMpcH7Q>

Day 4 ... <http://youtu.be/8MPksPbQUXM>

Day 5 ... <http://youtu.be/gZcEP2CUwLc>