

# THE FUTURE OF TRANSPORTATION TECHNOLOGY

## IBTTA WASHINGTON BRIEFING

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## PRESENTATION OVERVIEW

- *Introduction*
- *Technology Landscape*
- *Emerging Trends*
- *Future of Transportation*
  - *Near Term*
  - *Mid-Term*
  - *Long Term*

## INTRODUCTION



- *A transportation engineer & communications expert*
- *Dabble in transportation technology &*
  - *~15 year career in ITS*
    - *USDOT's ITS Joint Program Office*
- *Write about technology*
  - *Social Media & Transportation*
  - *Transportgooru.com*
  - *@Transportgooru (socialmedia)*

## TODAY'S TECHNOLOGY LANDSCAPE

- *Where are we today - Hurtling towards Intelligent Mobility*
  - *Intelligent Vehicles*
    - *Connected Vehicles (4G vs DSRC)*
    - *Automated Vehicles*
      - *Level 1 & Level 2 Systems*
  - *Intelligent Infrastructure*
    - *Proliferation of ITS*
- *Where are we headed*
  - *Connected & automated*
    - *Level 3 & 4 Systems on the Horizon*
  - *5G on the horizon*

# BUICK ADVANCED 4G LTE CONNECTIVITY



On RemoteLink

Connect to your vehicle remotely

Connected by



Built-in Wi-Fi hotspot



## CONNECTED VEHICLES



Faster access to Buick AppShop and vehicle apps



Connect up to seven mobile devices at once





# AUTOMATED VEHICLES



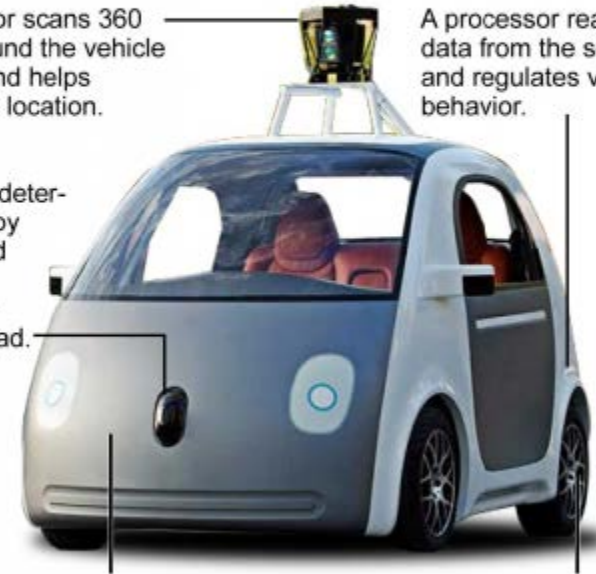
## Los Angeles Times Google's self-driving car

Would you take a ride in a car that has no steering wheel, pedals, brakes or accelerator? How Google's self-driving car works:

A laser sensor scans 360 degrees around the vehicle for objects and helps determine its location.

A processor reads the data from the sensors and regulates vehicle behavior.

Radar helps determine speed by detecting and measuring the speed of vehicles ahead.



Orientation sensor located inside the car tracks the car's motion and balance.

Wheel hub sensor detects the number of rotations to help determine the car's location.





# AUTOMATED VEHICLE EVOLUTION



## EMERGING TRENDS

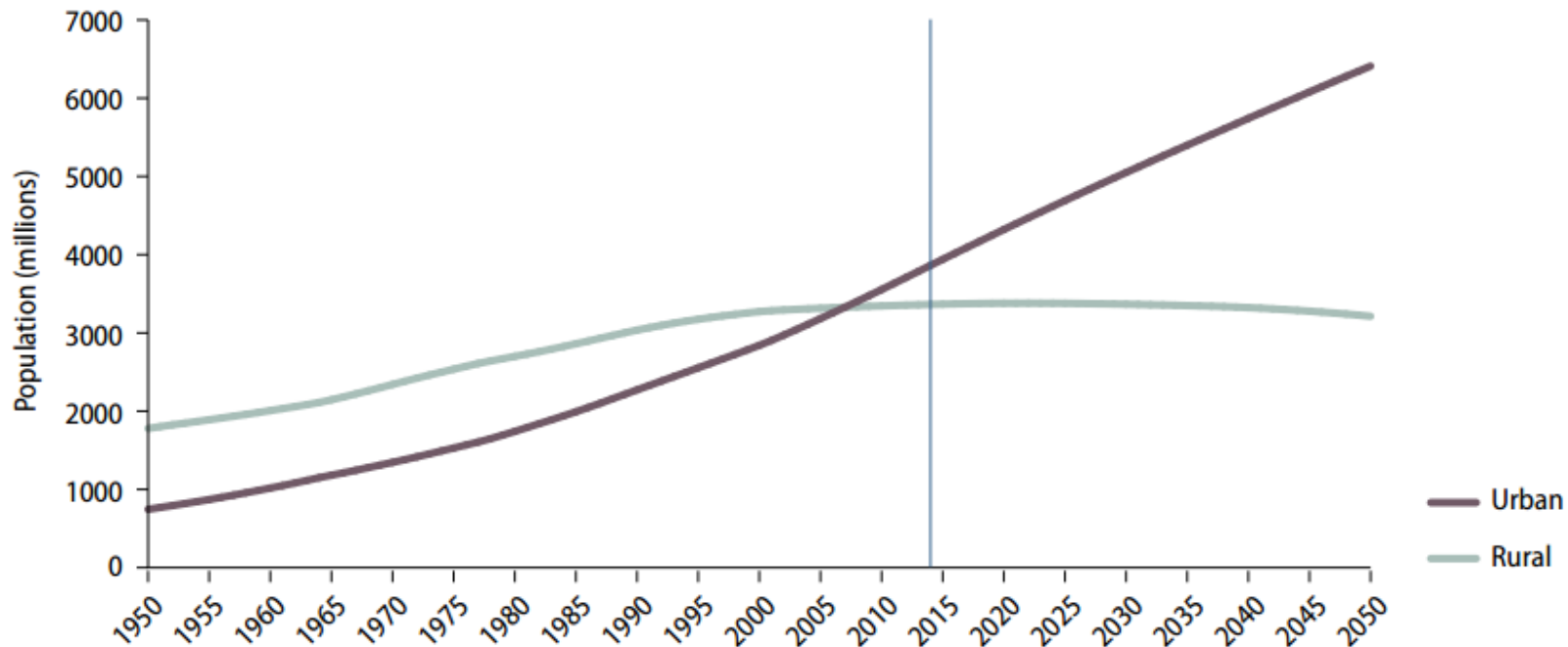
- Urbanization
  - Mega-regions
  - 2014 - 54% of global population lives in urban areas
  - 2050 – 66% of global population will be living in urban areas
- Mobility is big business & it is changing fast
  - Uber, Lyft, etc.,
  - RideScout, Urban Engines, etc.,
- Smarter & Greener Mobility
  - Fight for dashboard dominance
  - Electric
- Seismic shift & New Epicenter(s)
  - Silicon Valley vs. Detroit
  - Innovate or die
- Futuristic technology & the unknown
  - Hyperloop
  - Human piloting will be illegal
  - Telecommuting on steroids



## EMERGING TRENDS

- Urbanization
  - Mega-regions
  - 2014 - 54% of global population lives in urban areas
  - 2050 – 66% of global population will be living in urban areas

Figure 2.  
Urban and rural population of the world, 1950–2050



**A majority of the  
world's population  
lives in urban areas**

## EMERGING TRENDS

- *Mobility is big business and it is changing fast*
  - *Web 2.0 unleashed Location-Based Services (Uber, Lyft, etc)*
  - *As of [July 2014](#), there were 23 car-sharing operators in the US with over 1.3 million members and 19,115 vehicles.*
  - *One car-sharing vehicle replaces 9 to 13 vehicles among car-sharing members because their vehicles were sold or they postponed purchasing vehicles.*
  - *Teens are not keen on driving*



## SMARTER & GREENER MOBILITY

- *Plugin Electric & Plugin Electric Hybrid vehicles will be the norm*
- *Paying for electricity & getting paid*
- *Efficiency & performance gains achieved through over-the-air updates*
- *Sharing Economy*





# FUTURE OF TRANSPORTATION



- Mobile payments will dominate
- Cash transactions will continue to decline
- In-Dash Payments

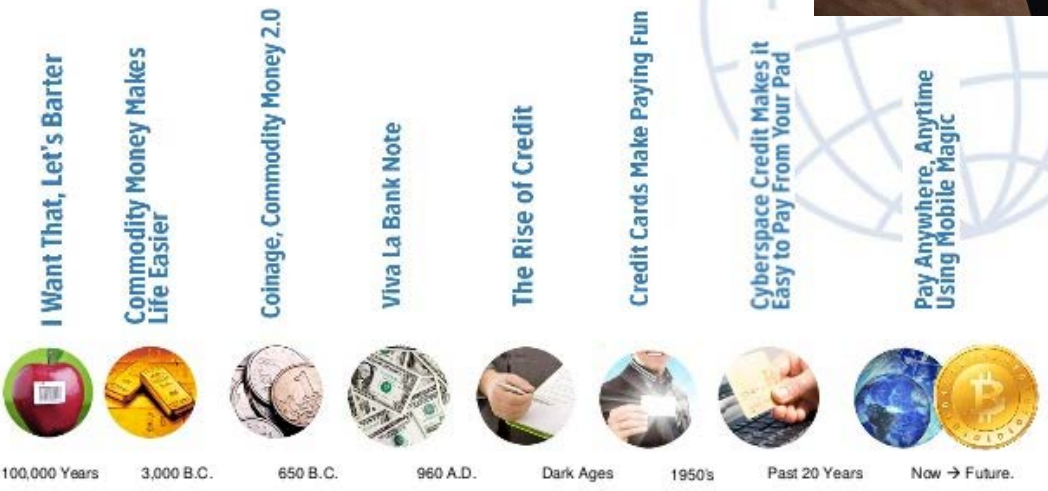
# FUTURE PAYMENT SYSTEMS



PAY WITH YOUR PHONE,  
NO CASH REQUIRED



## THE EVOLUTION OF PAYMENTS



## CLOSING REMARKS

- *Mobility*
  - *Mobility as a service*
  - *Perceptions vary*
  - *Shift in public attitudes*
  - *Public transportation is ripe for disruption*
- *Policy wrinkles*
- *Impacts of Net-Neutrality & 5G*



## QUESTIONS & COMMENTS

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