Transportation Technology

- Allen Biehler, Carnegie Mellon University
- Michael Cammisa, Association of Global Automakers
- Susan Martinovich, CH2M
- Jean-François Barsoum, Smarter Cities IBM
Connected and Automated Vehicles

Transformation in Mobility

Allen Biehler
June 6, 2016

Major Transportation Changes

- Personal car
- Zipcar – internet, wireless technology + on-line payment
- Real-time knowledge of all modes – seamless connectivity
  - ubiquitous smart phones
  - collaboration of people
  - data assets
  - technology platforms
Microtransit

Commuter buses
- Leap Transit or Chariot in San Francisco
- Bridj

Personal cars as taxis
- Lyft
- Uber

Dynamic vanpools
- Via in New York.

Company shuttles
- Google bus

Driverless Vehicles

Commuter buses
- Leap Transit or Chariot in San Francisco
- Bridj

Personal cars as taxis
- Lyft
- Uber

Dynamic vanpools
- Via in New York.

Company shuttles
- Google bus
When?

- Driverless cars by 2020
  (Cadillac, Tesla, Google, Volvo, Audi, Mercedes-Benz and Nissan)

- Fully driverless vehicles by 2025
  (Boston Consulting Group)

- Driverless trucks and cars by 2026-2030
  (European Road Transport Research Council)

Automated Vehicle Issues

- Technical
- Regulatory
- Operating
- Policy
Policy Issues

Only 6% of big US cities are planning or thinking about automated vehicles.

National League of Cities
Only 6% of big US cities are planning or thinking about automated vehicles.

National League of Cities

**Big issues**

- Death toll nearly 3,000/mo. in US
- $230 billion in annual accident cost
- 30% of urban land in US devoted to parking and roadways
Big issues

- 50 billion gallons of gasoline imported
- Cars & trucks produce 80% of transportation carbon emissions
- By 2050, there could be 10 million more vehicles in US urban areas

Manhattan
11:30am
June 2, 2016
Potential Outcomes

- One shared autonomous vehicle (SAV) could replace 9 conventional vehicles (Kockelman et al, University of Texas)
- SAV’s in cities could result in one-fifth the number of cars (Carlo Ratti, SENSEable City Lab, MIT)
- SAV’s could reduce traffic or make cars cheaper and increase traffic (Marshall Brown, Illinois Institute of Technology)
Potential Outcomes

- Driverless technology will facilitate electric vehicles.
- More affordable housing if reduce parking requirements.
- More independent mobility for people with low incomes.

“Stop adding highway lanes and more parking lots. Instead build ideal driverless urban environment”

(Gabe Klein)
Actions to Consider

- Roadway design
  - Narrower lanes and cartways
  - Special lanes for driverless vehicles
  - Curbside design for heavier pick-ups & drop-offs
  - Pedestrian and bicycle safety design
  - Eliminate curbs

- Parking
  - Reduce or eliminate on-street / off-street parking

- Transit
  - Continue investment in fixed-route, fixed guideway
  - Accommodate microtransit providers
    - Stop and station design
    - Service integration
Actions to Consider

✓ Urban design
  o Consider driverless car pockets within cities.
  o Capture up to 90% of urban land devoted to roadways and parking.
  o Lower or eliminate parking requirements for developments.
Huge Collaboration Opportunity