Autonomous Vehicles in California

Bernard C. Soriano, Ph.D.
Deputy Director, California DMV
California at a glance

- Approximately 38 million people
- Over 172 thousand public road miles
- 25 million driver licenses and identification cards
- 73% commute to work alone
- 32 million actively registered vehicles
- Over 323 billion vehicle miles travelled per year
California Legislation – Senate Bill 1298

As soon as practicable, but no later than Jan. 1, 2015, DMV must adopt regulations setting forth requirements for:

• Manufacturers’ *testing* of autonomous vehicles on public roadways

• *Operation* of autonomous vehicles on public roadways
• Autonomous vehicle technology advancing quickly
• Adoption by the public will not be dependent on technology
  – Human factors (HMI)
  – Societal benefits (safety)
  – Generational norms
• Potential traffic safety improvements are immense
  – Over 30,000 traffic fatalities per year
  – Almost all (95%) of traffic fatalities were the result of human error
  – In over 35% of traffic fatalities, the brakes were not applied
  – 20% of traffic accidents involve a distracted driver
• Government and industry need to work collaboratively
  – Regulations
  – Communication
NHTSA defines 4 levels of autonomous vehicles

- Level 0 – No automation
- Level 1 – Function specific automation
- Level 2 – Combined function automation
- Level 3 – Limited self-driving automation
- Level 4 – Full self driving automation
Bosch and Google examples
• Autonomous vehicles available now
  – 2014 Mercedes S class
  – 2014 BMW i3, 5-Series
  – 2014 Cadillac XTS

• NHTSA Level 3 autonomous vehicles being tested now
  – Private test tracks
  – Human reaction testing

• Variety of technology being developed
  – V to V
  – V to X, sometimes called V to I
  – Road train concept
  – Self contained processing
  – Cloud computing
  – Mapping dependency
• Autonomous vehicles available now
  – 2014 Mercedes S class
  – 2014 BMW i3, 5-Series
  – 2014 Cadillac XTS

• NHTSA Level 3 autonomous vehicles being tested now
  – Private test tracks
  – Human reaction testing

• Variety of technology being developed
  – V to V
  – V to X, sometimes called V to I
  – Road train concept
  – Self contained processing
  – Cloud computing
  – Mapping dependency
• Volvo
  
  No fatalities in a Volvo vehicle by the year 2020
  
  – Collision avoidance systems
  – Road train or platooning
  – Commercial trucking industry

• Audi A-7 demo at the 2013 CES

• Humans are not the best in emergency situations

• Digital natives more accepting than digital immigrants
- Volvo
  No fatalities in a Volvo vehicle by the year 2020
  - Collision avoidance systems
  - Road train or platooning
  - Commercial trucking industry

- Audi A-7 demo at the 2013 CES

- Humans are not the best in emergency situations

- Digital natives more accepting than digital immigrants
• Volvo

  No fatalities in a Volvo vehicle by the year 2020

  – Collision avoidance systems
  – Road train or platooning
  – Commercial trucking industry

• Audi A-7 demo at the 2013 CES

• Humans are not the best in emergency situations

• Digital natives more accepting than digital immigrants
• Volvo
  No fatalities in a Volvo vehicle by the year 2020
  – Collision avoidance systems
  – Road train or platooning
  – Commercial trucking industry

• Audi A-7 demo at the 2013 CES

• Humans are not the best in emergency situations

• Digital natives more accepting than digital immigrants
Challenges

– Definition
– Safety
– Liability
– Privacy
– Security
– Licensing
– Reliability
– Infrastructure
Senate Bill 1298 Statewide Steering Committee

- California State Transportation Agency
- California Department of Insurance
- California Highway Patrol
- California Office of Traffic Safety
- California Department of Transportation
- California Department of Motor Vehicles
- National Highway Traffic Safety Administration
Regulatory Package 1

- Submission of evidence of insurance
- Marking of vehicle on DMV’s database
- Operator qualifications
- Target date of December 2013

Regulatory Package 2

- Testing requirements
- Safety standards
- Operator license requirements
- Vehicle registration requirements
- Other feasible regulations
- Target date of December 2014
Questions