



# Autonomous Vehicles in California

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# 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:

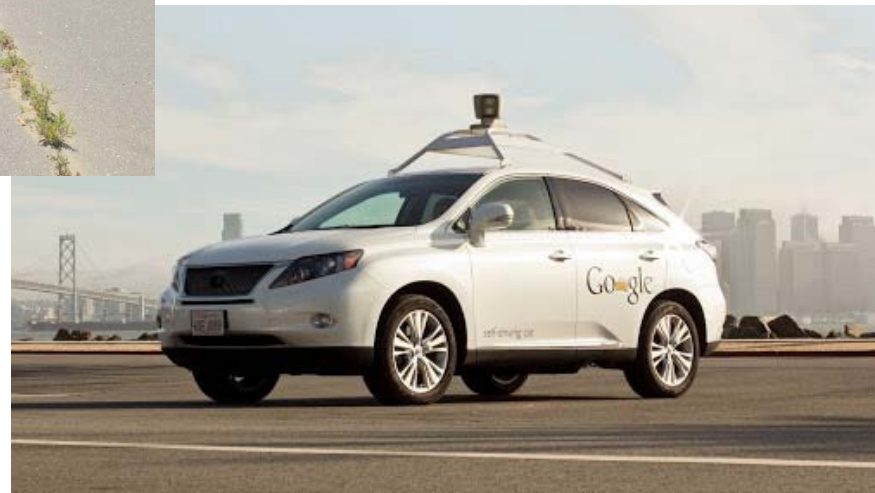
- Manufacturers' *testing* of autonomous vehicles on public roadways
- *Operation* of autonomous vehicles on public roadways

- 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

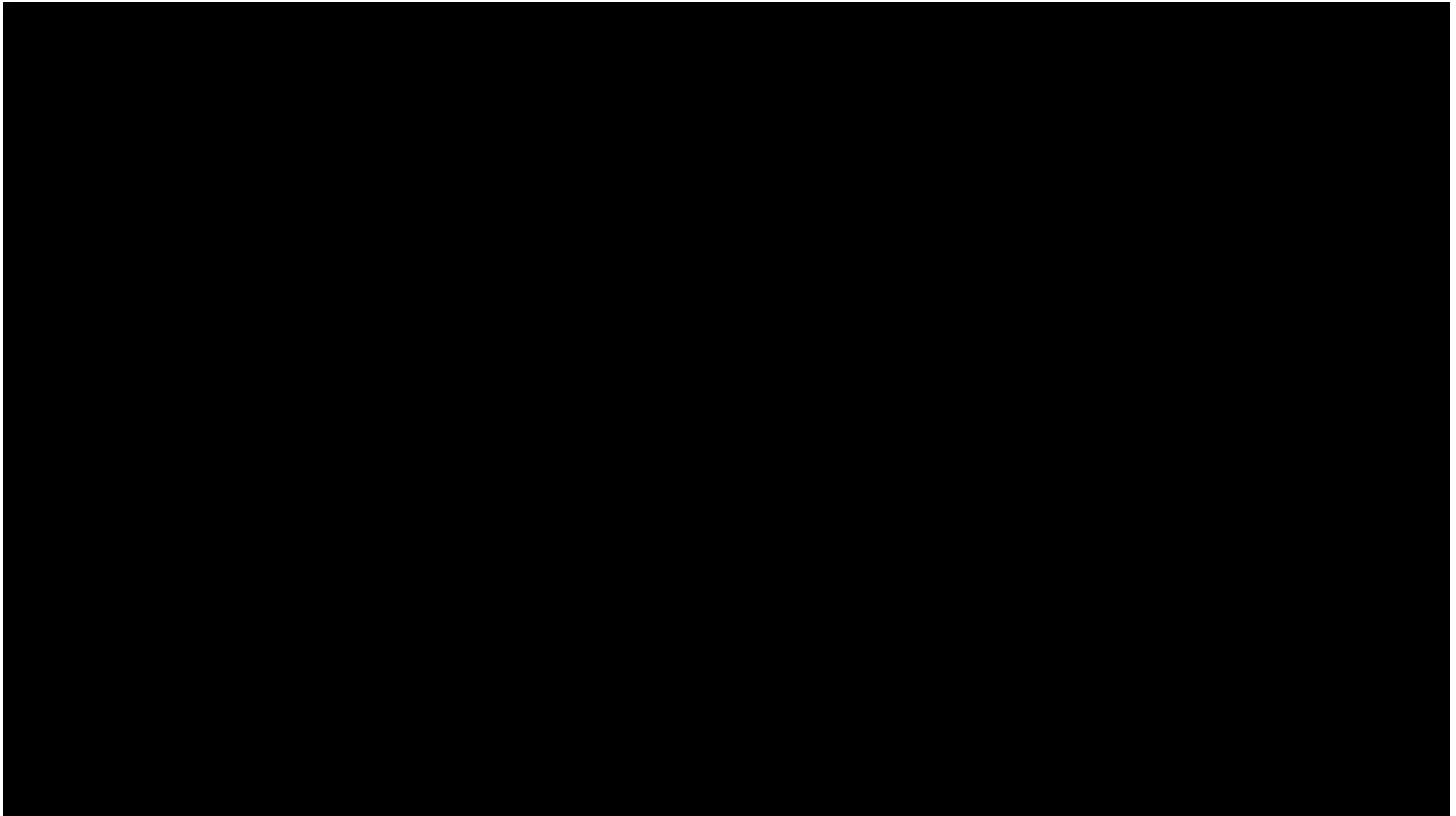
# NHTSA defines 4 levels of autonomous vehicles

- 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





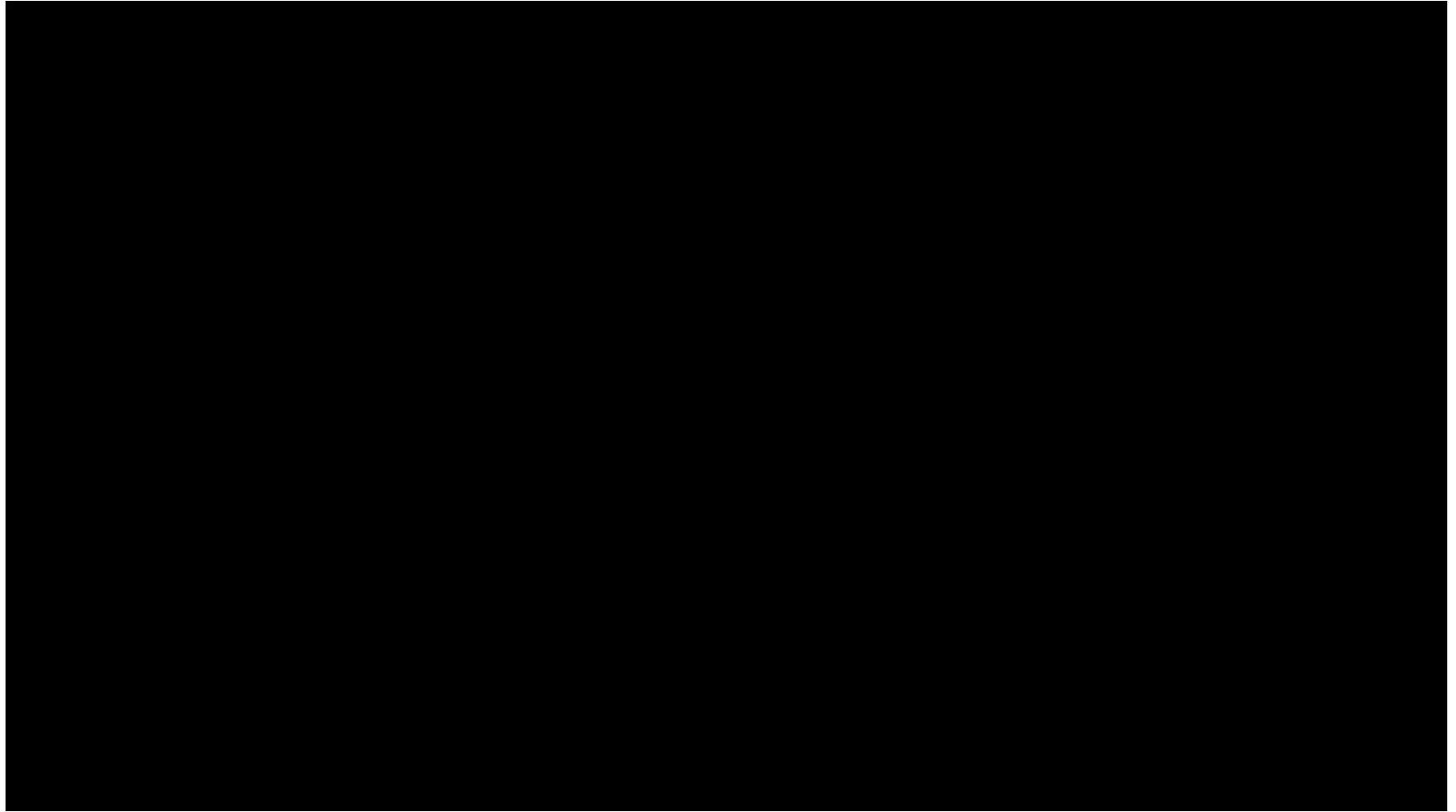




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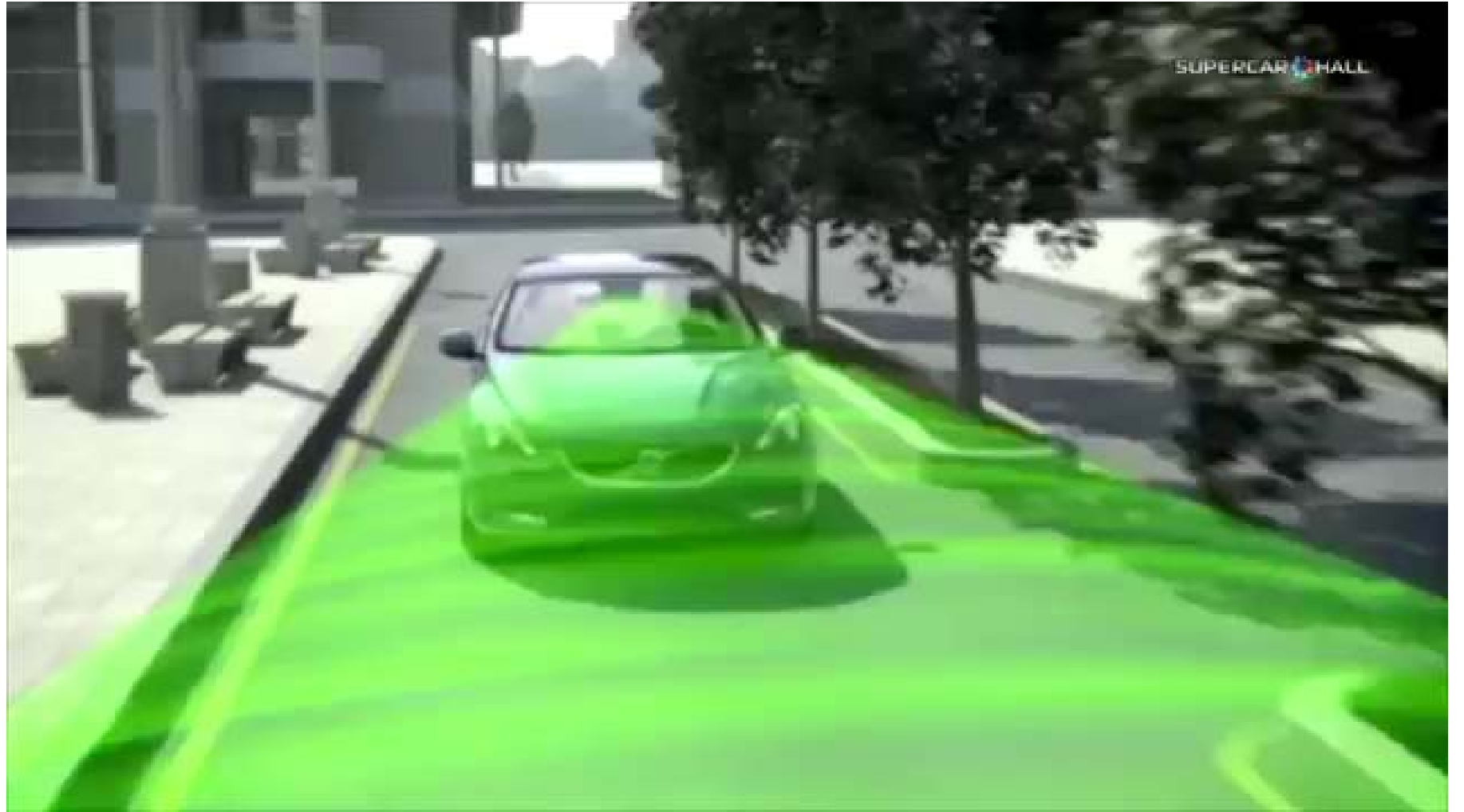
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FOR HIGHWAY SAFETY**

- 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



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  - 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



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# 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