Exploring the Potential of Autonomous and Connected Vehicles on the Bay Area's Express Lanes

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THE IDEA

- Leveraging express lanes to demonstrate Autonomous Vehicle (AV) and Connected Vehicle (CV) technologies
  - Identify benefits
  - Identify technology and policy requirements
  - Identify challenges

THE BAY AREA

TESLA

Google

Ford

NISSAN

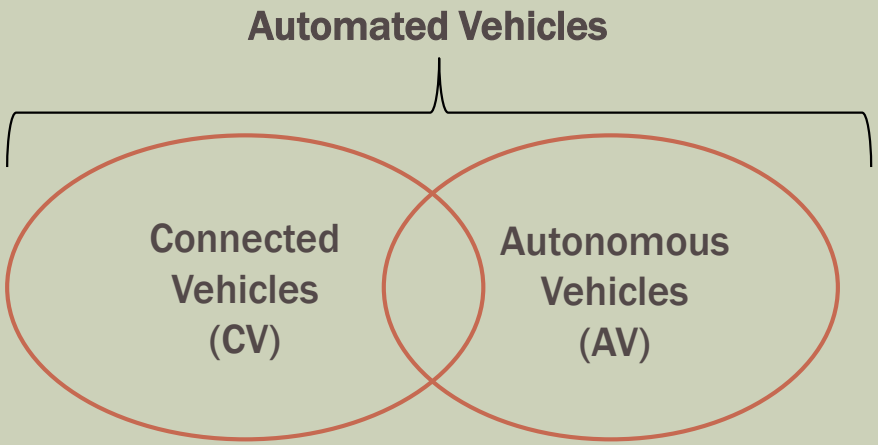
Volkswagen

DELPHI

BMW

Silicon Valley

DEFINITIONS

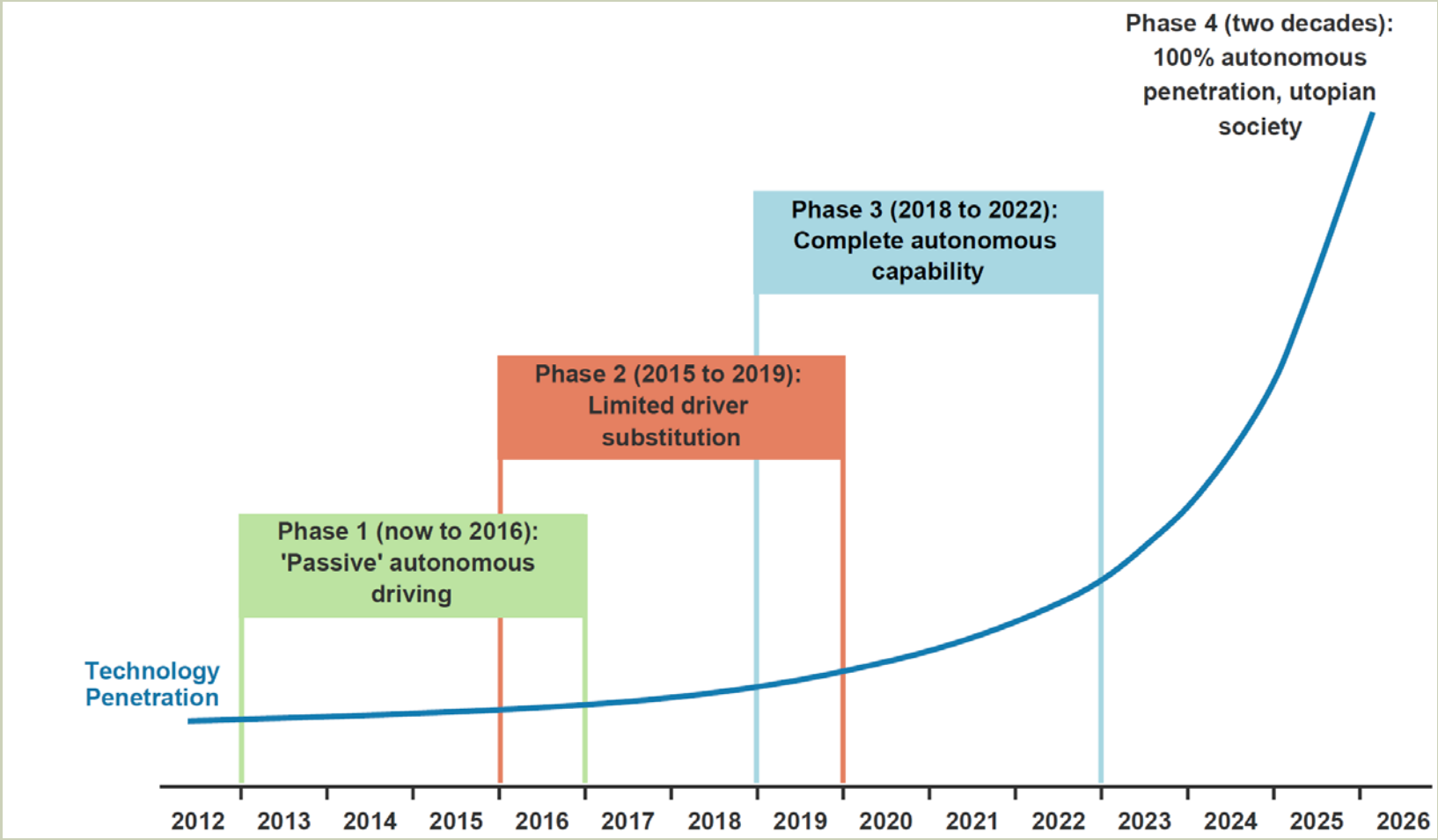


AUTONOMOUS VEHICLES ARE COMING…

"The state of autonomous vehicle technology seems likely to advance with or without legislative and agency actions at the federal level. However, the manner in which autonomous vehicle technologies progress and will eventually be implemented depends heavily on these efforts. Intelligent planning, meaningful vision, and regulatory action and reform are required."

- Preparing a Nation for Autonomous Vehicles: Opportunities, Barriers, and Policy Recommendations, Eno Center for Transportation

…AND SOON



Morgan Stanley, Autonomous Cars: Self-Driving the New Auto Industry Paradigm, Nov 2013

POTENTIAL IMPACTS

Positive

- Safety
- Productivity
- Capacity improvements
- Improved mobility

Negative

- Increased VMT and urban sprawl
- Job loss

OBSTACLES FOR ADOPTION

- Consumer Acceptance
- Safety
- Regulation
- Liability
- Infrastructure
- Security & Privacy

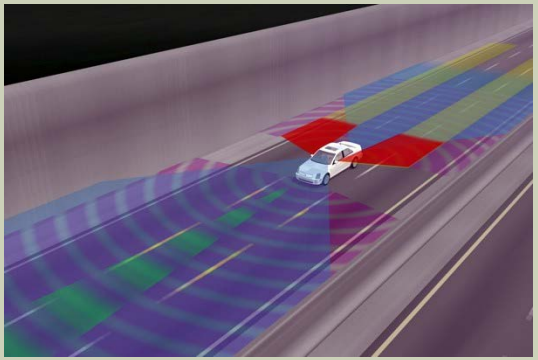
TWO DEVELOPMENT TRACKS

Urban Applications

- More variables to consider
- Enhanced sensing capabilities and algorithms required

Highway Applications

- Fewer variables in a controlled environment
- Much of the technology already exists (lane keeping, adaptive cruise control)



HYPOTHETICAL SCENARIO

WHY EXPRESS LANES?

- Enhanced infrastructure and equipment
- Maintain reliability/free-flow speeds
- Minimal lane changes required while traveling in express lanes
- Located on commute corridors with high demand
- Networks

POTENTIAL BENEFITS

- Improved throughput
- Less infrastructure and narrower footprint
- Increased data
- Ability to push information to vehicles
- Potential to use CV technology to toll, verify occupancy
- Next step in the evolution of express lanes

CHALLENGES

- Risks may outweigh benefits
- Trajectory of technology development unpredictable
- Bay Area express lanes may not be ideal environment
- Not in line with express lanes goals

CONCLUSIONS

- Enthusiasm mixed with uncertainty
- Looking to state and feds to set policy and guidance
- What is the future of express lanes in a world with automated vehicles?