May 5, 2022

A STRATEGIC VISION FOR AUTOMATED VEHICLES

City of Bellevue and City of Seattle

City of Seattle

presented to
Puget Sound Regional Council
Regional Traffic Operations Committee

presented by
Cities of Bellevue / Seattle
Cambridge Systematics, Inc.

City of Bellevue

Agenda

- Project Background and Objectives
- Stakeholder Outreach Findings
- Industry Scan Findings
- Major Milestones in AV Technology
- AV Strategic Vision
- Q&A

PROJECT BACKGROUND AND OBJECTIVES

Regional Goals for Bellevue/Seattle

- Improve Safety
- Invest in Innovation
- Ensure Transportation Equity
- Leverage Strategic Partnerships
- Increase Mobility Options
- Enhance Sustainability

Adapted from City of Bellevue 2018 Smart Mobility Plan; SDOT 2017 New Mobility Playbook, and Washington State AV Work Group 2018 Cooperative Automated Transportation Policy Framework

AV Strategic Vision

- Why?
  - Prepare for automated mobility, with a focus on ensuring that programming, resources, and investments are maximizing the readiness at varying levels of AV deployment in the region.
- How?
  - State of the Industry Review
  - Technology Readiness and Milestones
  - Needs Assessment
  - Recommendations, Opportunities, and Risk

Automated Vehicle Applications

For Hire:
Shared autonomous vehicles operating on current ride-hailing models

Personal Vehicles:
Privately owned highly automated vehicles

Mass Transit:
Autonomous transit vehicles such as buses that add efficiency to high-volume transit routes

Shared Fleet Vehicles:
Shared highly automated vehicles, made available through collective programs

Specialized Transit:
Autonomous vehicles (typically vans or shuttles) designed to serve local transit needs

Drones:
Unmanned aerial vehicles used for last-mile deliveries

Commercial Freight:
Autonomous freight vehicles or trucks

Personal Delivery Devices:
Last-mile autonomous delivery vehicles, operating on the sidewalk

STAKEHOLDER OUTREACH FINDINGS

Available Policy and Regulatory Levers

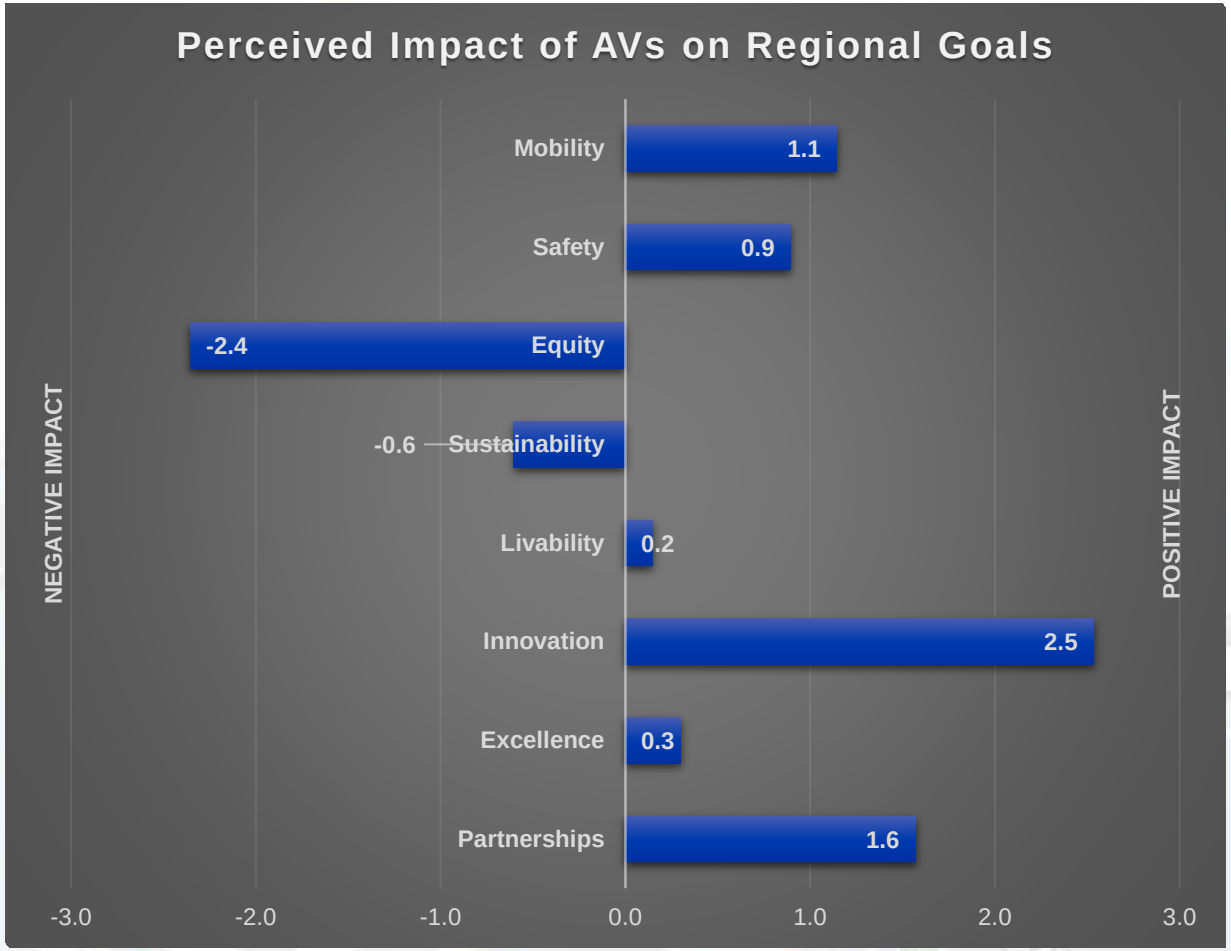
Require Operational Permits	Identify Suitable Routes / Areas	Educate Stakeholders and Public	Invest in AV-Friendly Infrastructure	Issue RFPs/RFIs to Learn More	Establish AV-Only Facilities
Modify Curb Management	Facilitate Stakeholder Engagement	Establish Data Sharing Requirements	Link New Technologies to Equity Goals	Provide Grant Funding	Invest in City Fleets as EV / AV
Invest in Workforce Training	Designate Special Testing Facilities	Designate Special Parking and Staging Locations	Use Congestion Pricing to Mitigate ZOVs	Advance Communications Backbone	Adapt Land Use Policies

Public Agency Needs

Outreach Completed To-Date:
- City of Bellevue
- City of Seattle
- WSDOT/WSTC

Upcoming:
- City of Bellevue Council

- Increase public awareness and education (L3 vs. L4 AVs)
- Targeted curb management
- Ensuring compliance of AV companies with safety requirements
- Guidelines regarding safety testing requirements
- Lessons learned from AV deployments



Major AV Developer Needs

Outreach Completed To-Date:
- Motional
- Mobileye
- Cruise

Upcoming:
- Zoox

- Designated legal pick-up/drop-off locations for AV activities
- Operating needs of profitable AV business models
- Permit requirements and regulations across jurisdictions that are streamlined and clear (i.e., minimize variation between states)
- Funding opportunities to further AV deployments

"AV companies do not expect government agency to do major infrastructure updates to accommodate AVs because that is not a cost-effective solution."

- Senior Policy Manager at AV Developer

INDUSTRY SCAN FINDINGS

Regulatory and Policy Roles

Federal Role

- Setting Federal Motor Vehicle Safety Standards (FMVSS) for new motor vehicles and equipment
- Enforcing compliance with FMVSS
- Investigating/managing noncompliance
- Public education of motor vehicle safety issues

State Role

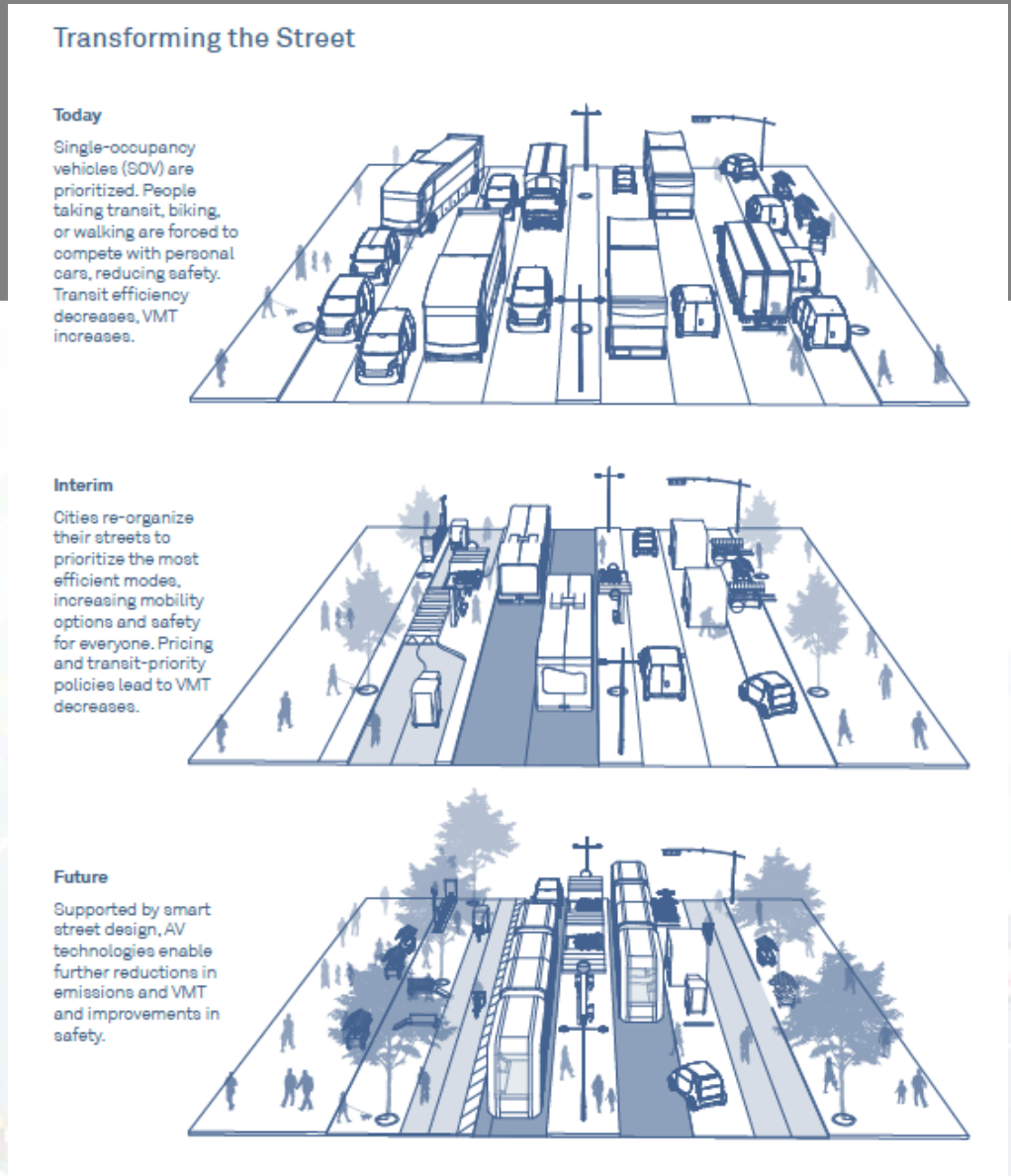
- Licensing human drivers
- Registering motor vehicles
- Enacting/enforcing traffic laws
- Conducting safety inspections
- Regulating motor vehicle insurance and liability

Local Role

- Implement AV policies that are aligned and complementary with state AV policies
- Develop a localized approach to AV deployment that helps to achieve regional goals
- Manage and operate local infrastructure/systems

AV Policy and Regulatory Guidance

- USDOT AV 4.0 & Comprehensive Plan
- NACTO's Principles for Autonomous Urbanism
  - Design for Safety
  - Move People not Cars
  - Distribute the Benefits Equitably
  - Data-Driven Decision Making
  - Technology is a Tool
  - Act Now!
- Additional resources from peer cities, organizations, and researchers

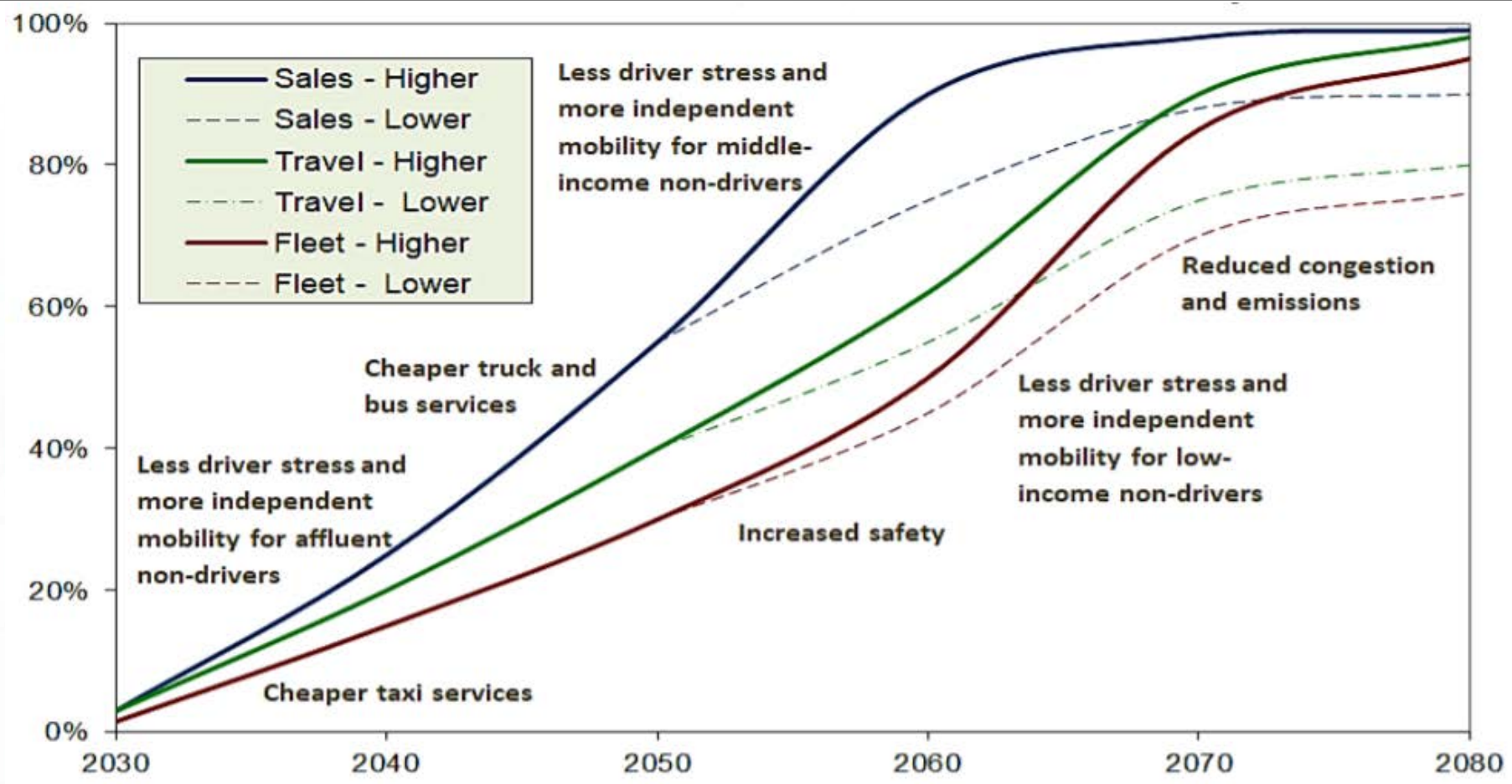


Source: NACTO Principles for Autonomous Urbanism

Washington Policies Impacting AV Operations

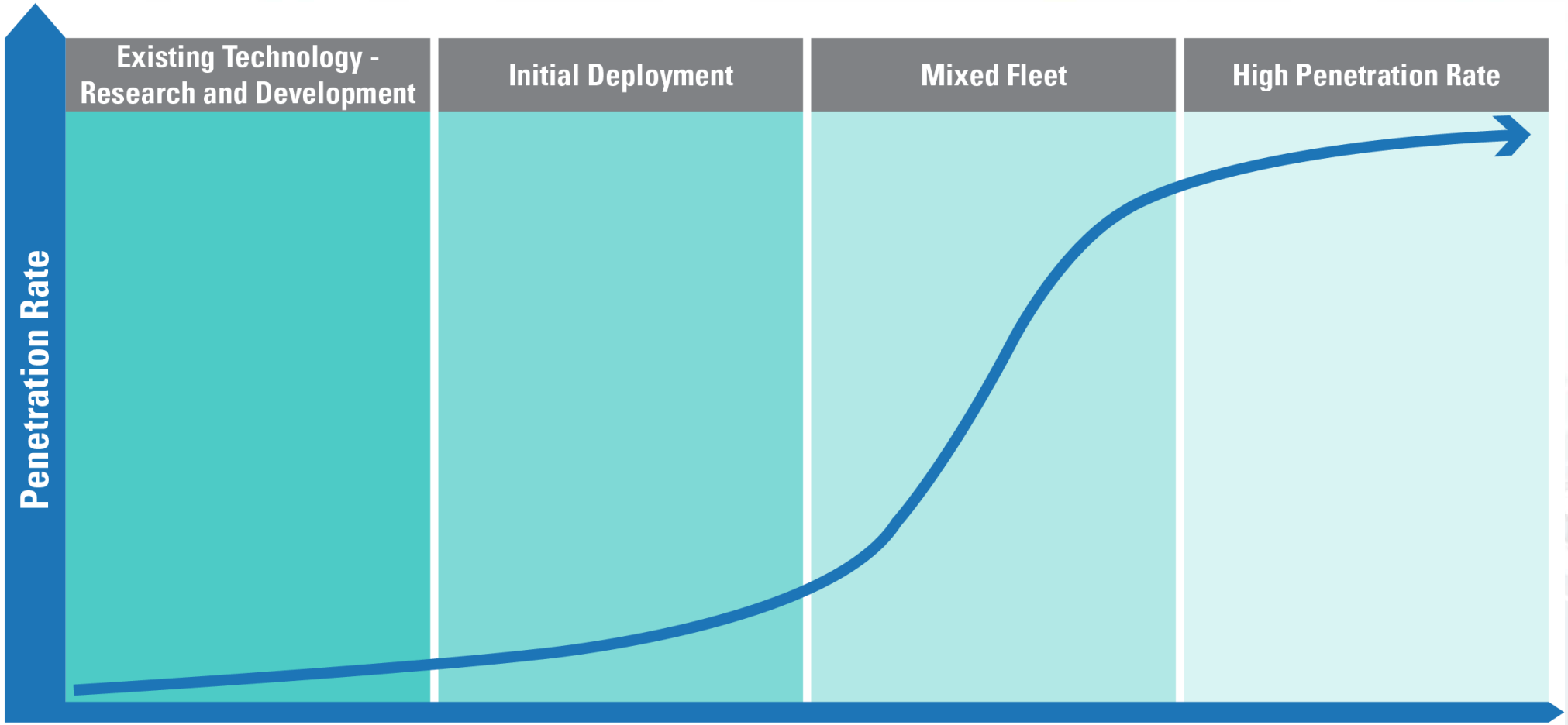
- Federal and State Level
  - Permissive stance on AV technology testing and piloting
  - Absence of state policies restricting cities' authority to regulate AV operations on public streets
- Local Level
  - Responsible for implementing AV policy and regulations that ensures the safe operation of AVs on public streets

Autonomous Vehicle Sales, Fleet, Travel and Benefit Projections



Source: Victoria Transport Policy Institute

Stages of AV Development



Case Studies on Stimulating AV Partnerships

- City of Portland: RFI focused on how AVs could benefit Portland's existing public transit system
- City of San Jose: RFI seeking concepts for AV solutions in specific corridors
- MTC in Bay Area: Innovative Deployments to Enhance Arterials (IDEA) Shared Automated Vehicles (SAV) grants

Credit: Joey Kotfica

Pittsburgh Case Study: Permissive Approach

- Opted out of developing a written agreement with AV companies before testing AVs on city streets
- Instead established working groups to guide use of AV technology

Source: https://qz.com/904744/pittsburgh-officials-are-criticizing-ubers-one-way-relationship-with-the-city/

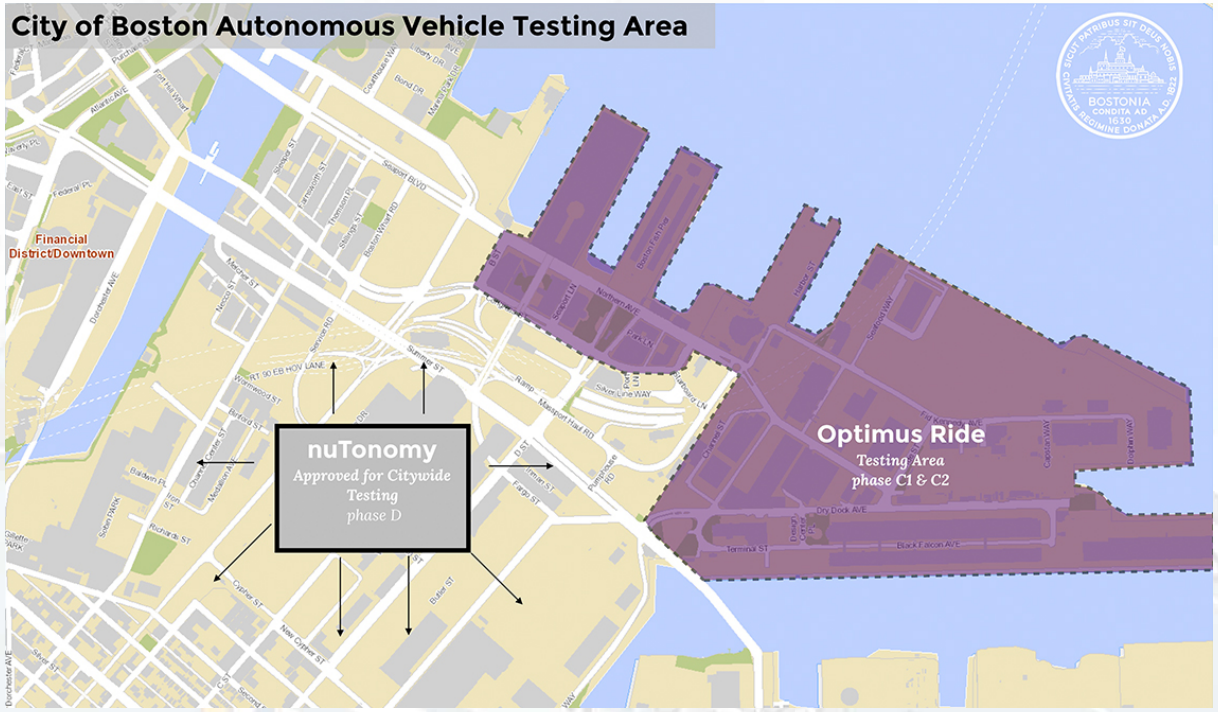
Chandler Case Study: R&D Promotion Case Study

- City of Chandler invited AV developers to test emergency response vehicles on a closed track
- City involved its police and fire department reps to advise on their specific needs and concerns

Source: Todd Photographic from AZ Central

Boston Case Study: Graduated Testing

- nuTonomy (now Motional), MassDOT, Registry of Motor Vehicles, port authority, state police, state government
- Developed graduated test plan that slowly increases level of complexity



Source: City of Boston

LA DOT Case Study: Curbside Management

- Led effort to “Code the Curb”
- Digitally identified curbside assets to strengthen ROW management
- Linkage to Mobility Data Specification (MDS) requirements for shared use mobility providers

Source: LA Metro

RTC Las Vegas Case Study: AV Shuttle Deployment

- Will be deploying low-speed AV shuttle circulators in the Las Vegas Medical District
- New first/last mile option for seniors and mobility challenged
- Lowered speed limit along key corridor as a commitment to prioritizing shared modes

Source: RTC

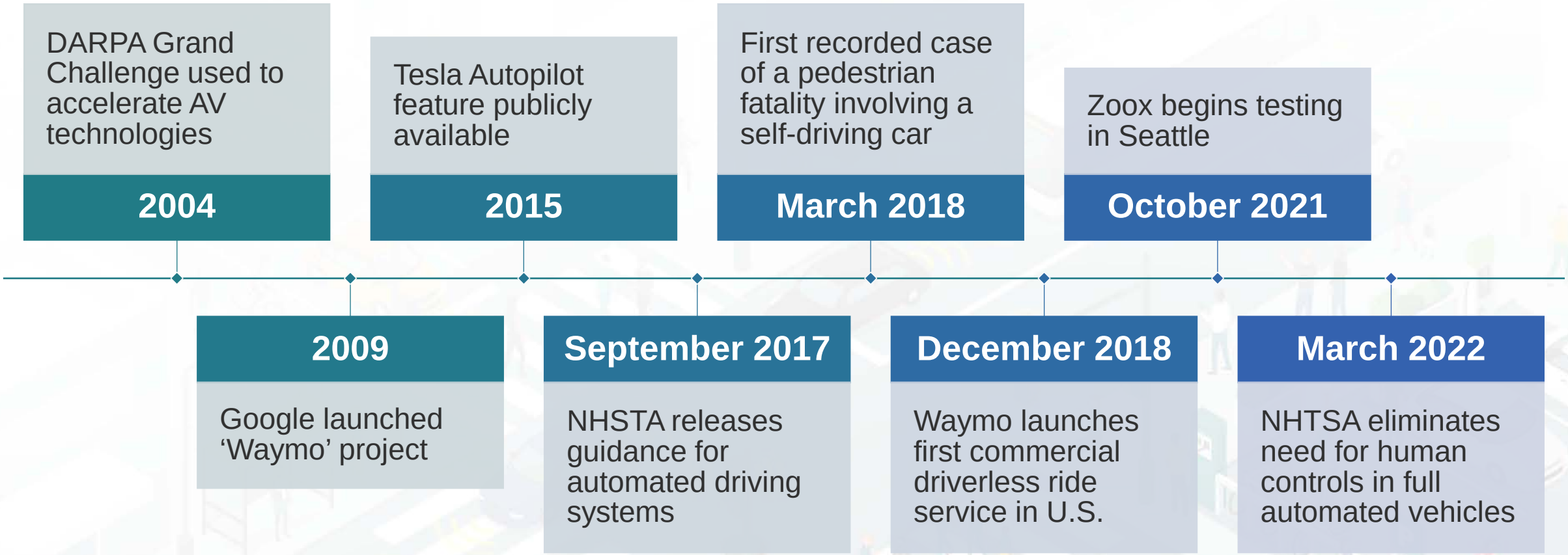
San Francisco Case Study: Waymo One Trusted Tester Program

- Launched robotaxi service in 2021 available to certain vetted riders in SF
- Riders chosen based on diversity of transportation needs
- Free service, equipped with human safety operators, operates 24/7
- Waymo Driver AV system is informed by 20 million self-driven miles on public roads

Source: Waymo

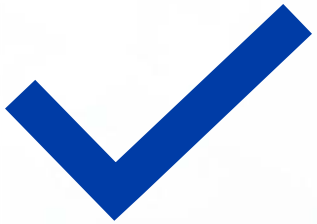

MAJOR MILESTONES IN AV TECHNOLOGY


Select AV Technology Milestones



AV STRATEGIC VISION

AV Strategic Vision



AV 101

SAE Levels

AV Application Types

Opportunities & Risks

Public Perception

Policy Environment

Roadmap

AV Tools

Timeframes

Actions

- Do Something vs. Do Nothing
- Near-term, Medium-term, or Long-term
- Roles and Responsibilities

Q&A

Thank you!

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