



Back to the Future – Developing a Transportation Technology Roadmap

ITS Washington

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About HDR

HDR is a nationally recognized architectural, engineering, design, planning and consulting services firm with nearly 10,000 employee-owners providing services to public and private clients throughout the United States, including much experience in California and around the Los Angeles area region.

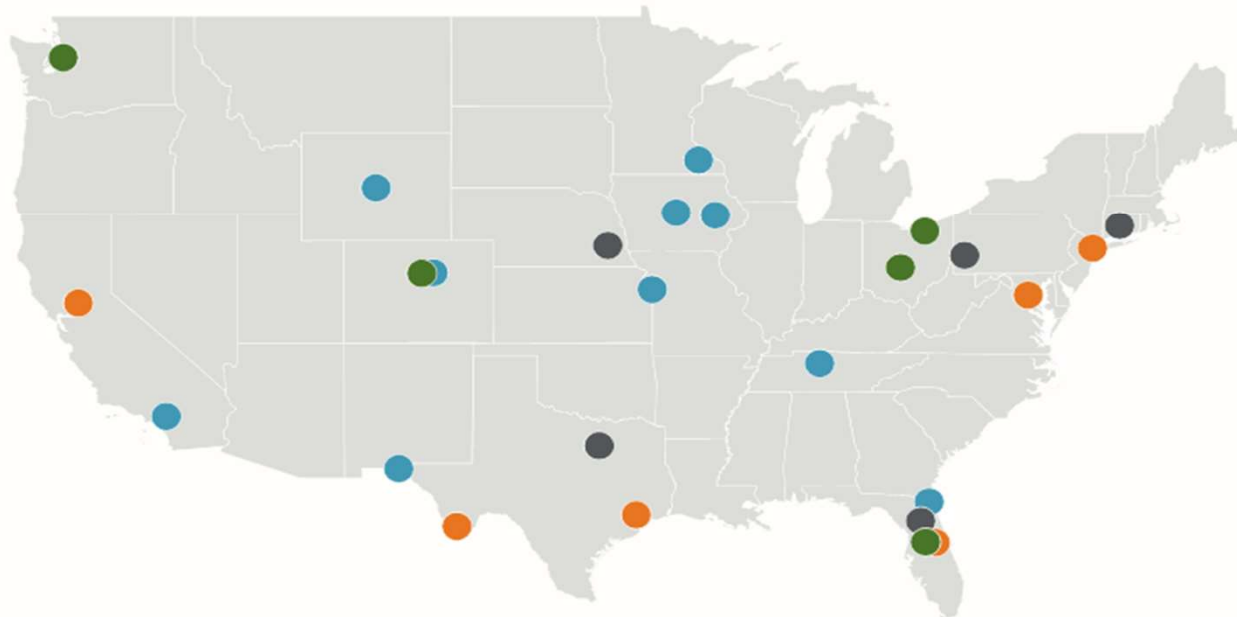
HDR is an industry leader in advanced transportation and technology implementations including comprehensive expertise in the piloting and implementing of AV microshuttles and other CAV technologies.

HDR's Advanced Technology Project Experience in Last Two Years

HDR's CAV and emerging transportation technology expertise includes the delivery of 25 technology oriented plans, policies, guidance, environmental, and design projects across the United States as shown in the Figure below.

LEGEND

- AV Micro-Shuttle
- AV Systems/Corridors
- CAV Strategic Plans
- CAV Evaluation Tools





01 Overview of ACES Technology Trends

- ## 02 Project Examples
- Smart Cities
 - Electrification
 - Regional Planning
 - AV Deployment

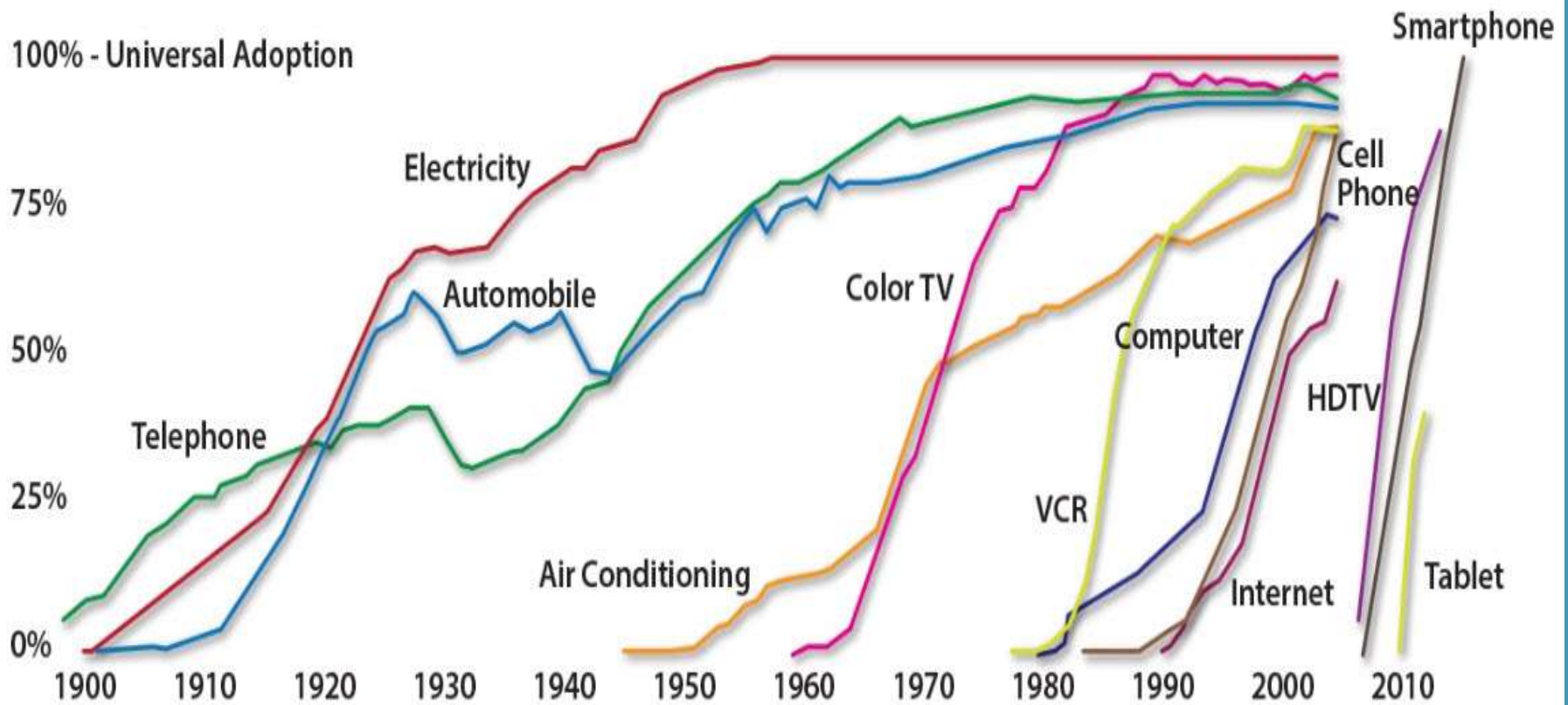
03 Collaborative Technology Roadmap Development



01

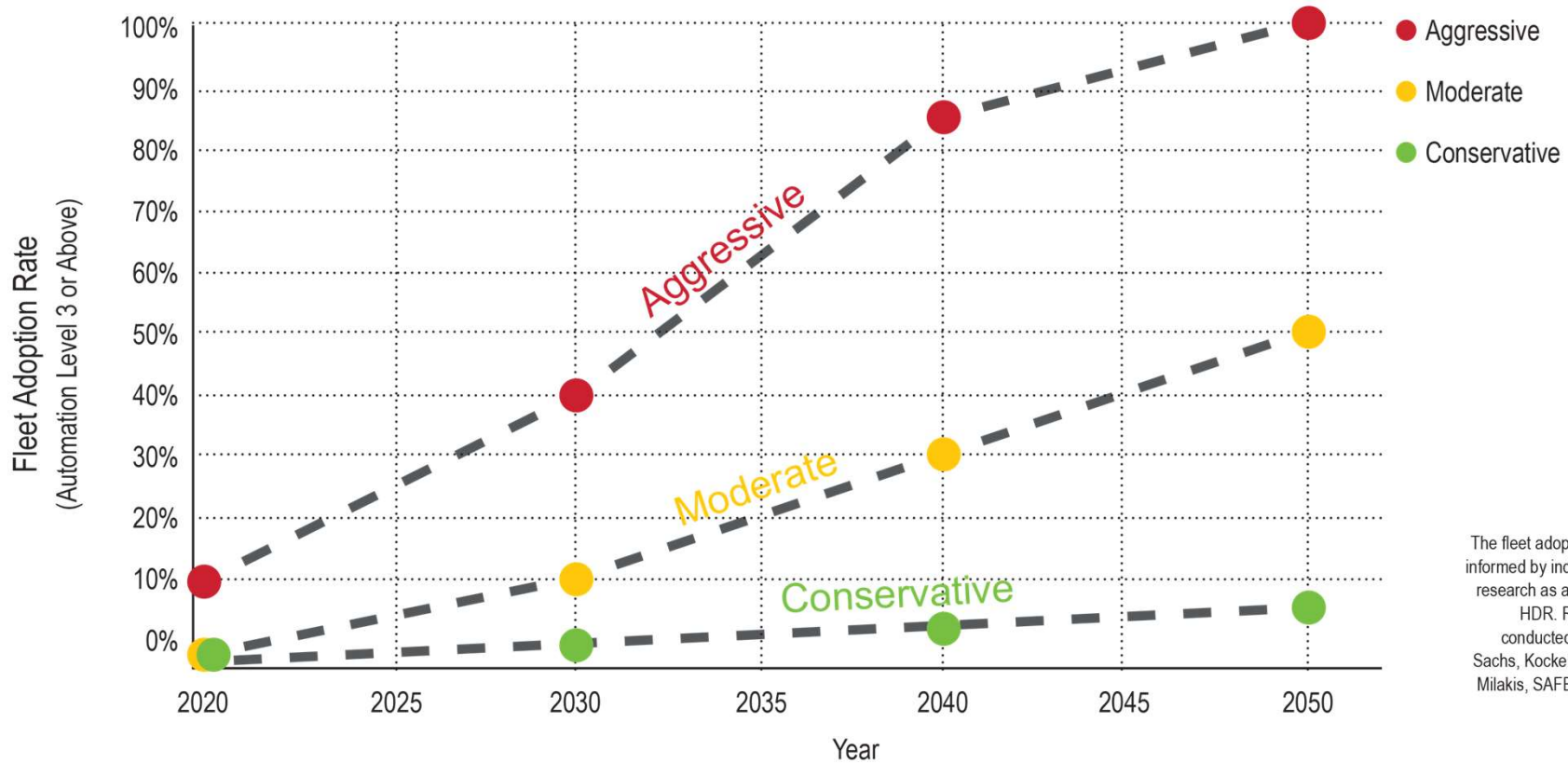
Overview of ACES Technology Trends

Speed of Adoption for Major Technology Innovations



Automated Passenger Vehicles

Fleet Adoption Rate



2020

Set the Stage for CV Technology Adoption



2030

Set the Stage for AV Technology Adoption



2040

Embrace a Fully Connected Transportation Network while Increasing AV Facilities



2050

Set the Stage for AV Technology Adoption





02

**Western US Project
Examples**

Smart Cities – LA County Smart Streetlights

Los Angeles County Department of Public Works

- Conversion to LED Streetlights provided an opportunity to incorporate Smart City applications.
- Developed Industry RFI
- Understand current commercially available technologies
- Technology Evaluation and Recommendations for Implementation
 - Feasibility
 - Benefits
 - Costs
- Iterative Process



Electrification – San Diego MTS Zero Emission Buses

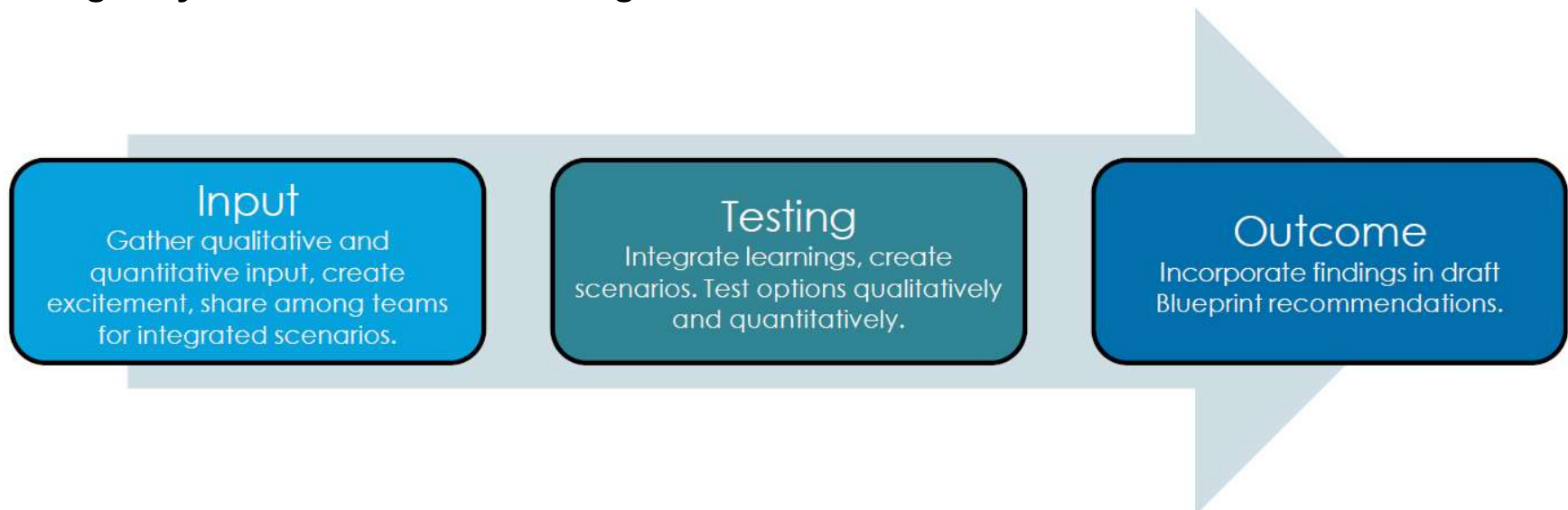
Transition to Electric Vehicles

- Combined Electrical and Civil Engineering Task
- No interruption of operations allowable
- Phased approach to eventually convert 100% of fleet to Zero Emission
- “Brown-field” meant geotechnical, surveyor, and additional time
- Planning now for Phase 2



Regional Planning – Denver Mobility Choice

Multi-Agency Collaborative Planning

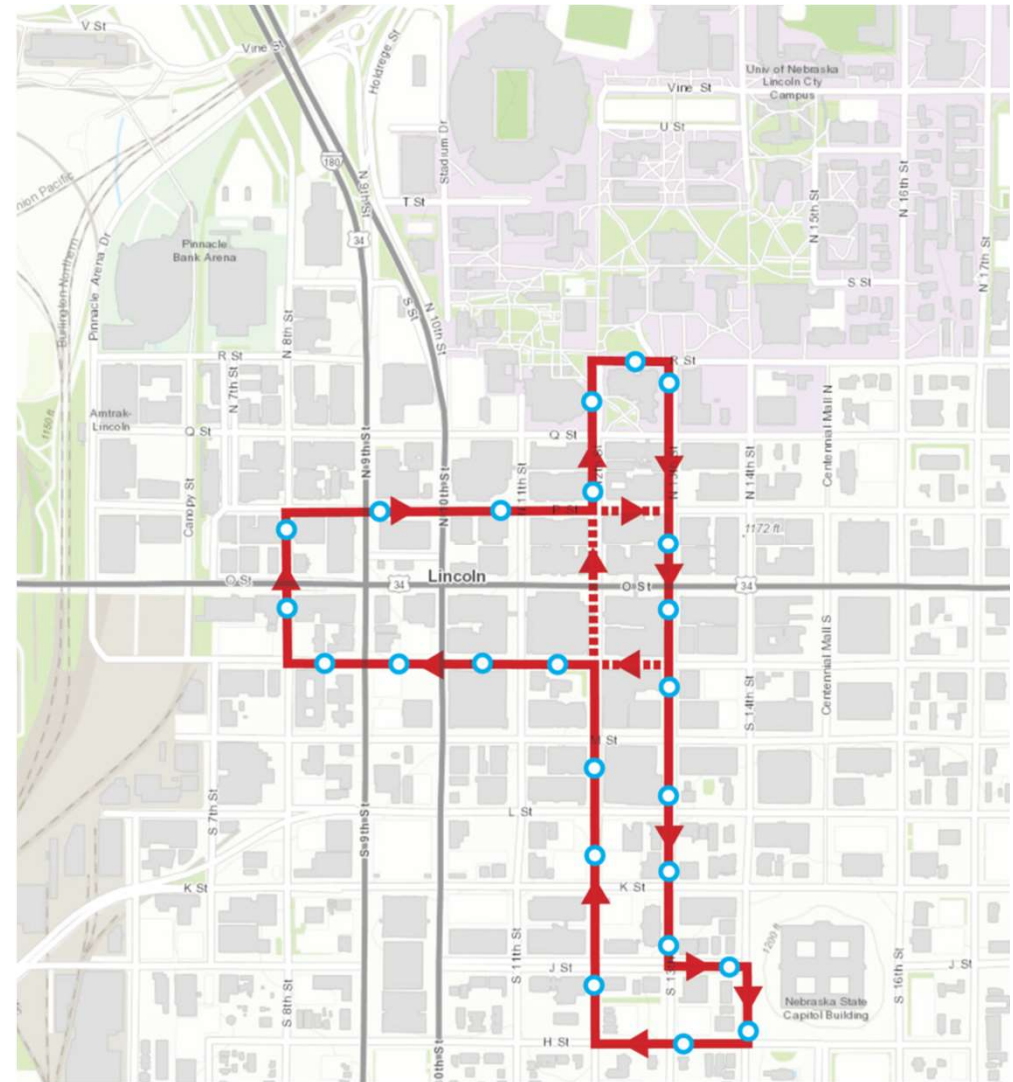


- Iterative process with multiple stakeholder groups
- Provide community outreach and fact-finding
- Provide multiple opportunities for stakeholder input
- Extensive technology assessment to ensure alignment with program goals

AV Deployment – Lincoln, Nebraska

Lincoln Multimodal Technology Vision

- Route Design
- Infrastructure Assessment
- Legislative Scan
- Business Model/Vendor Evaluation
- Grant Support



03

**Collaborative
Transportation
Roadmap Development**

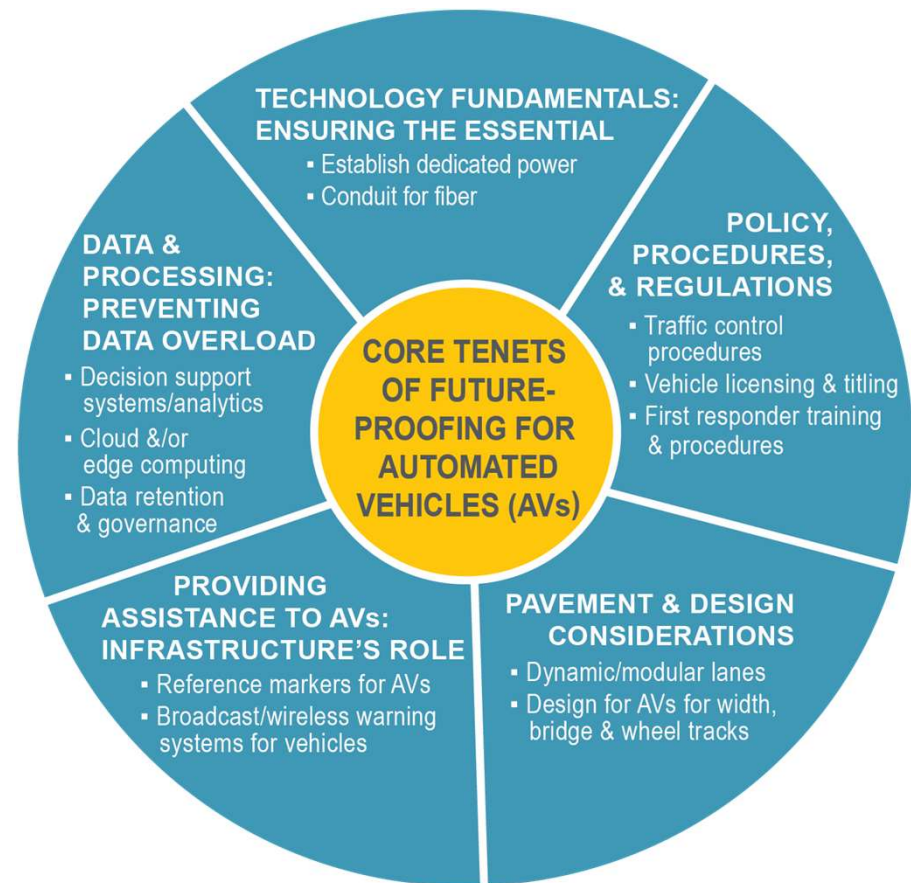




Wikipedia — “The process of anticipating the future and developing methods of minimizing the effects of shocks and stresses of future events.”

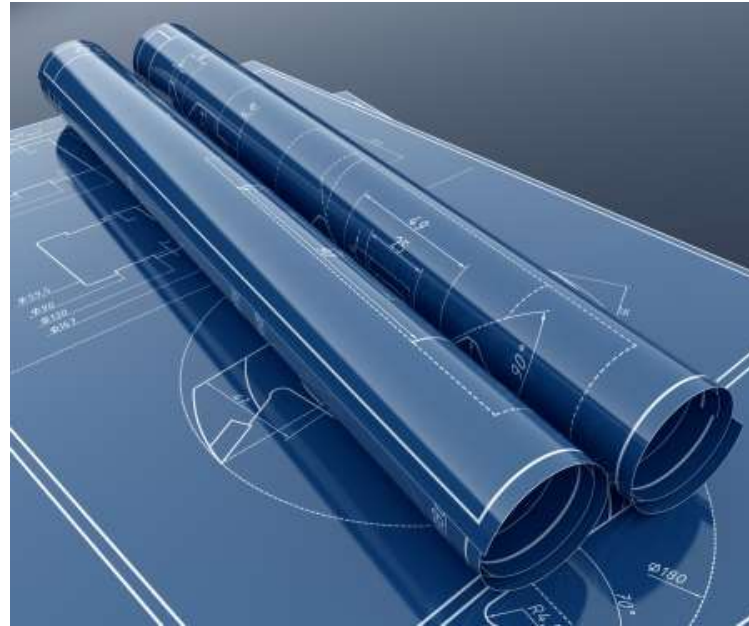
Core Tenants of Future-Proofing Highways and Roadways for Automated Vehicles

- Technology Fundamentals.
- Data and Processing.
- Providing Assistance to Automated and Connected Vehicles.
- Pavement and Design Considerations.
- Policies and Procedures.



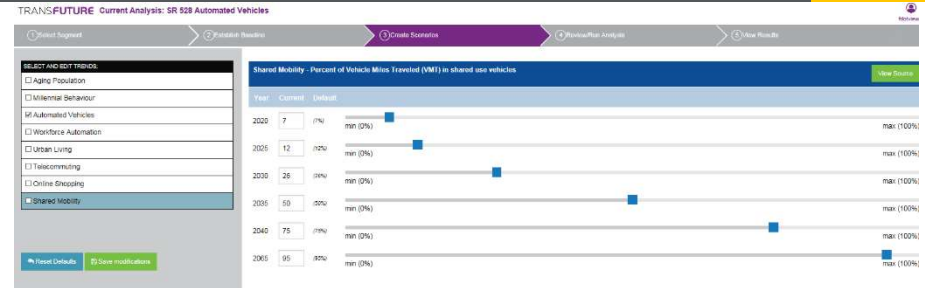
Future-Proofing Roadmap

- Identify stakeholders
- Lay out user needs
- Identify range of technology scenarios and implementation timelines
- Link potential technology solutions to user needs
- Consider funding sources
- Foster public acceptance



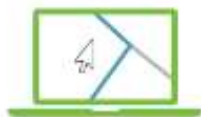
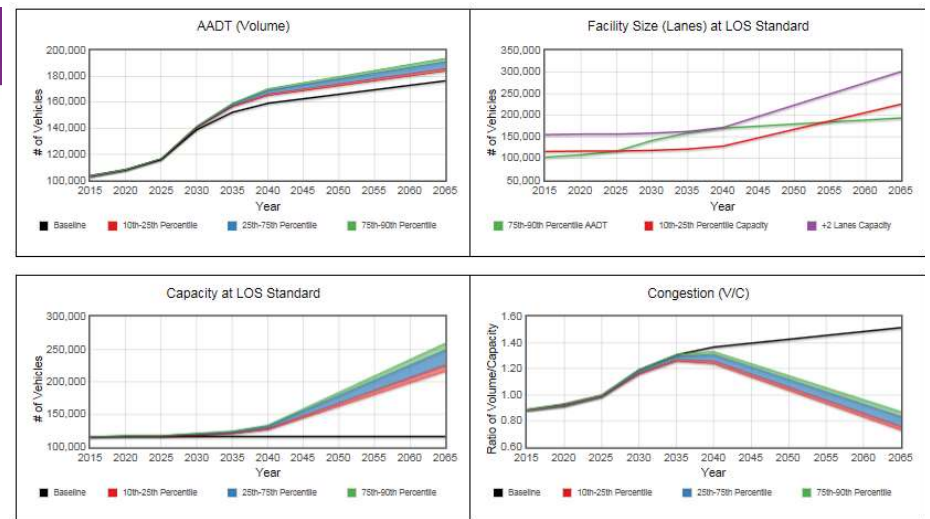
Incorporate ACES Into MPO Transportation Planning

- <https://fdotfuture.azurewebsites.net/>
 - fdotviewer for username and password



See what the future holds
Probabilistic Scenario Planning Tool for Emerging Technology and Societal Trends

Sign in to get started



SELECT SEGMENTS
Select roadway segments, corridors, or the whole system.



ESTABLISH BASELINE
Modify baseline data on your chosen segments for the timeframe you selected.



CREATE SCENARIOS
Choose and adjust emerging trends and technologies for your scenario.



RUN ANALYSIS
Run a Monte Carlo analysis on your customized scenario



VIEW RESULTS
View, compare, and export your results

Planning Approach Summary

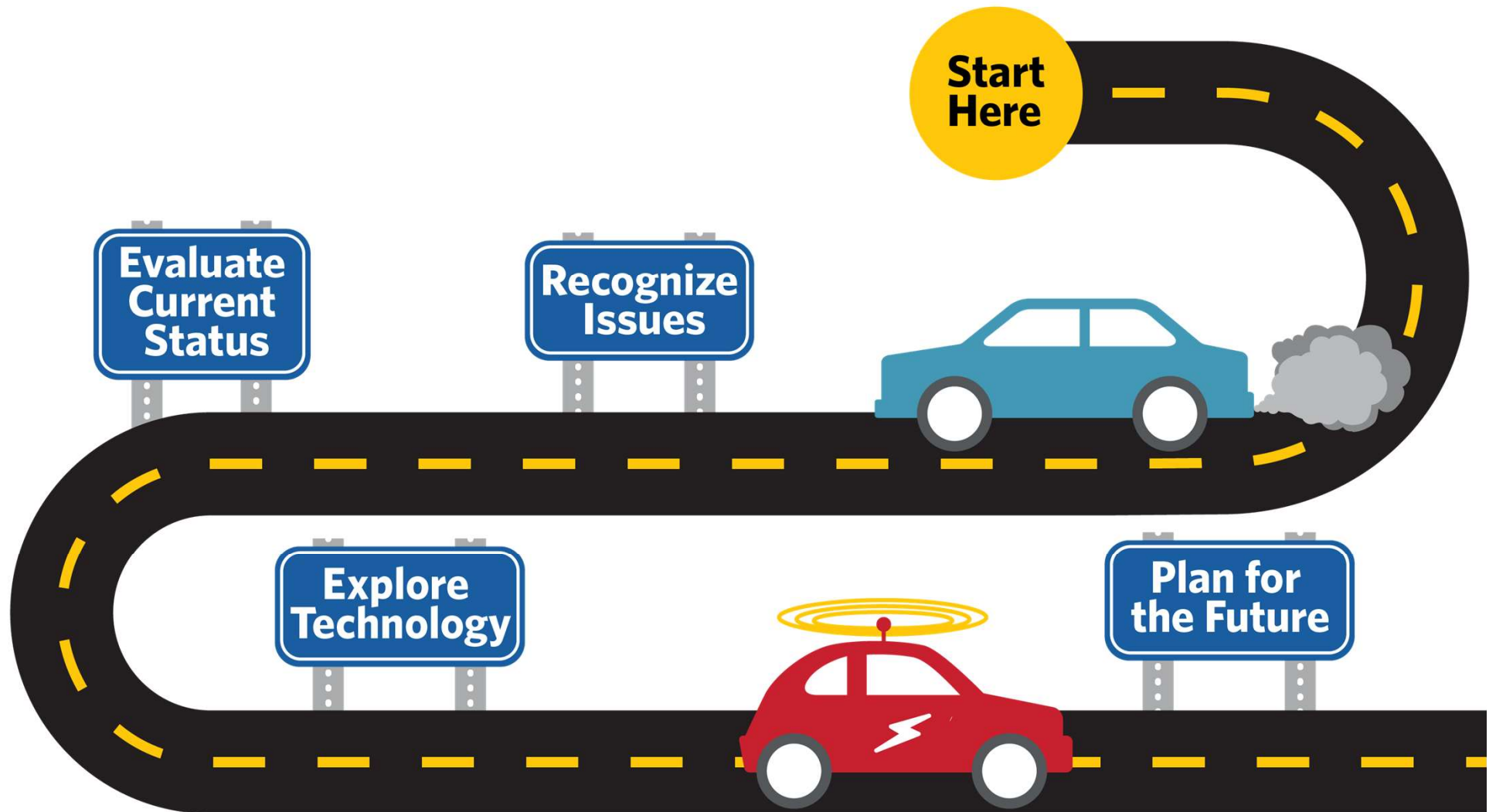
TRADITIONAL PLANNING STUDY

- Future Forecast — Business as usual.
- Traffic LOS Analysis
 - HCM - 20 year forecast — peak 15 minutes — density based.
- Roadway Facility Design
 - Standard design approach.

PLANNING FOR ACES (and other disruptive trends)

- Scenario Planning
 - Forecast technology impacts/other disruptive trends.
 - Analyze multiple scenarios.
- Comprehensive Operational Analysis
 - Traffic capacity due to AV/tech disruptors.
 - Crash prediction due to AV/tech disruptors.
 - Travel-time reliability modeling.
- Flexible Roadway Facility Design
 - Future-proofing for AV/tech disruptors.
 - Communications/Active Traffic Operations/ITS.
 - Right-size project.

The Time to Act is Now



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