AV Planning & Implementation:

A Review of Key Resources

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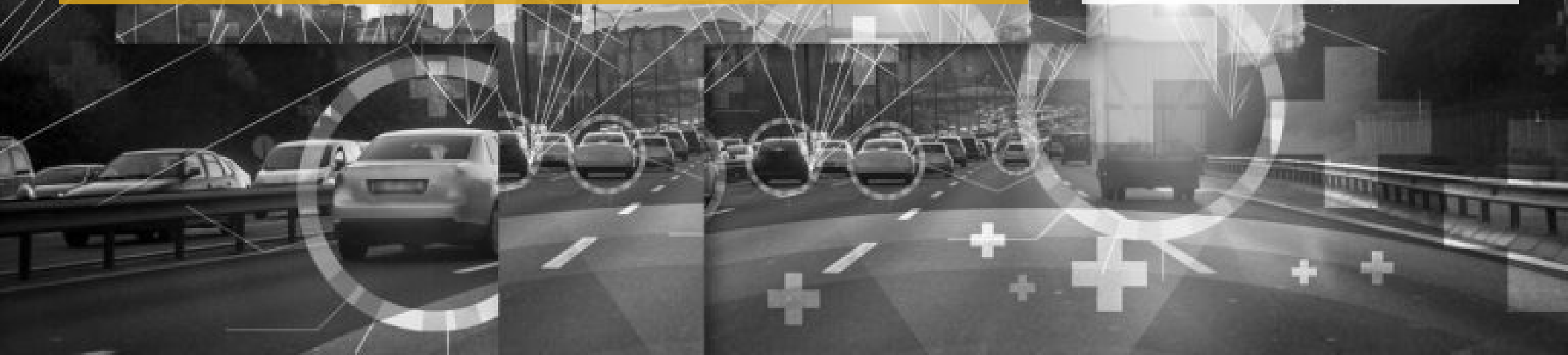
KITTELSON & ASSOCIATES

ITS Texas Annual Meeting
November 20, 2025



What are agencies asking?

01. **Planning for Capacity Impacts**

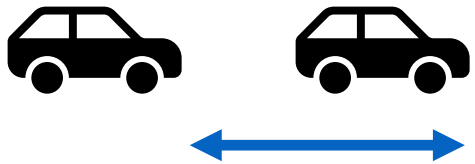
02. Regional Readiness

03. Infrastructure Readiness

… at 70 mph travel speed

2,400 pc/h/ln
→ 1.5 seconds → 154 feet

3,600 pc/h/ln
→ 1.0 seconds → 103 feet



7,200 pc/h/ln
→ 0.5 seconds → 51 feet

If we reduce perception-reaction time, we can reduce following headway and increase capacity

…THE REAL-WORLD CONDITIONS WE EXPECT

Image Credit: Cavnue

… THE PROBLEM WITH MOST AV STUDIES

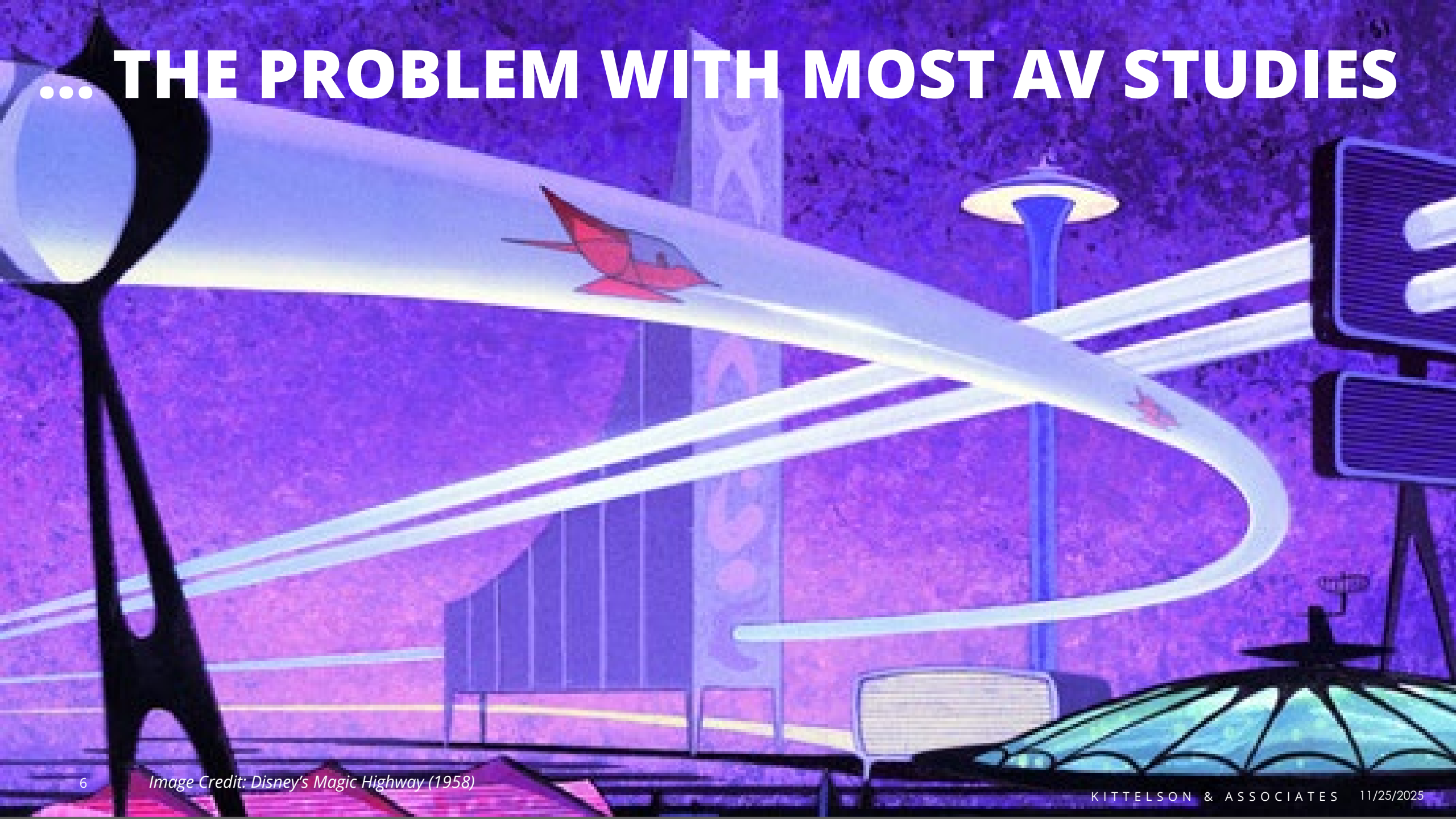
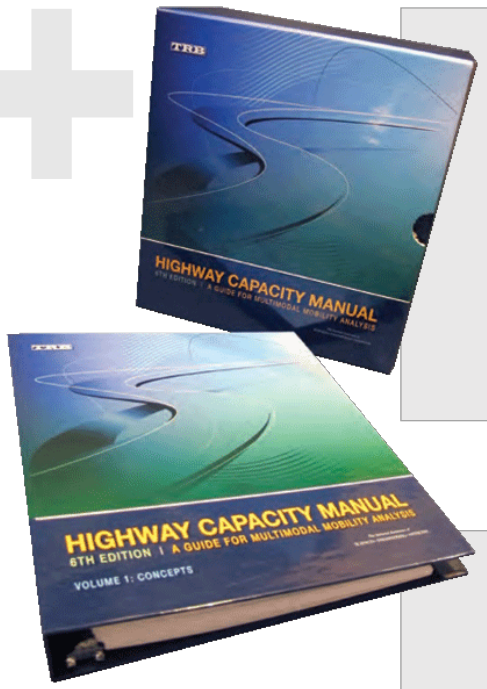


Image Credit: Disney's Magic Highway (1958)

HCM CAV Capacity Adjustment Factors – Pooled Fund Study



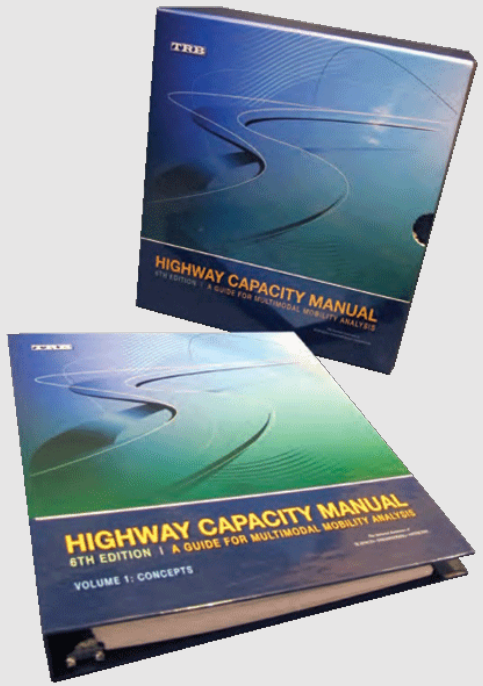
Objectives

- Develop capacity adjustments for connected and automated vehicles (CAVs) at different levels of volume and market penetration

Agent-Based Approach

- Vehicle and driver behavior fully customizable for simulation scenarios

Highway Capacity Manual (HCM) Context



- *Highway Capacity Manual* (HCM) traditionally used for long-range planning applications
- Agencies looking to answer questions about the impacts of connected and automated vehicles (CAVs) on future capacities
- Results from this study became official part of the *HCM 7th Edition*

HCM CAV Capacity Adjustment Factors: Key Findings

- CAVs will likely increase capacities, but
  - … not as soon as you may think
  - … not as much as media may suggest
- Actual capacity is a function of many factors and assumptions
- Planning-level estimates can inform decision-making, but agencies should understand modeling assumptions

CAV Capacity Adjustment Factor tables are in *HCM 7th Ed*

Segment Types:

- Basic Freeway Segments
- Freeway Merge Bottlenecks
- Freeway Weaving Segments
- Freeway Managed Lanes
- Signalized Intersections
- Roundabouts
- TWSC Intersections
- Urban Street Segments
- Two-Lane Highways

01. Planning for Capacity Impacts

02. **Regional Readiness**

03. Infrastructure Readiness

North Central Texas Council of Governments
AV2.1 Planning Study

How will transformational technologies affect regional decision making?

How can agencies predict and monitor the impacts of transformational technologies?

What are the potential future scenarios for automation in the region?

What are best-practices and funding opportunities for AV deployments?

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Future Scenario Modeling

Evaluated AV Impact on:

- Roadway Network Capacity
- Intersection Performance
- Population & Employment Distributions

What are the potential future automation scenarios in the region?

Tool Selected:

- TAFT: NCTCOG's regional travel demand model
- AV-TAFT: upgraded by UT Austin to enable AV traffic modeling
- CMAV-TAFT: further upgraded by team for scenario evaluation

Future Scenario Modeling

Modeling Summary:

- 29 different scenarios
- 0, 25, 50, and 100% fleet penetration rates

1st application of new CAV Capacity Adjustment Factors in *Highway Capacity Manual 7th Edition*

Key Assumption:

- Vehicles are both connected and automated. They follow closely at high speeds. They move through intersections more effectively.

Key Findings:

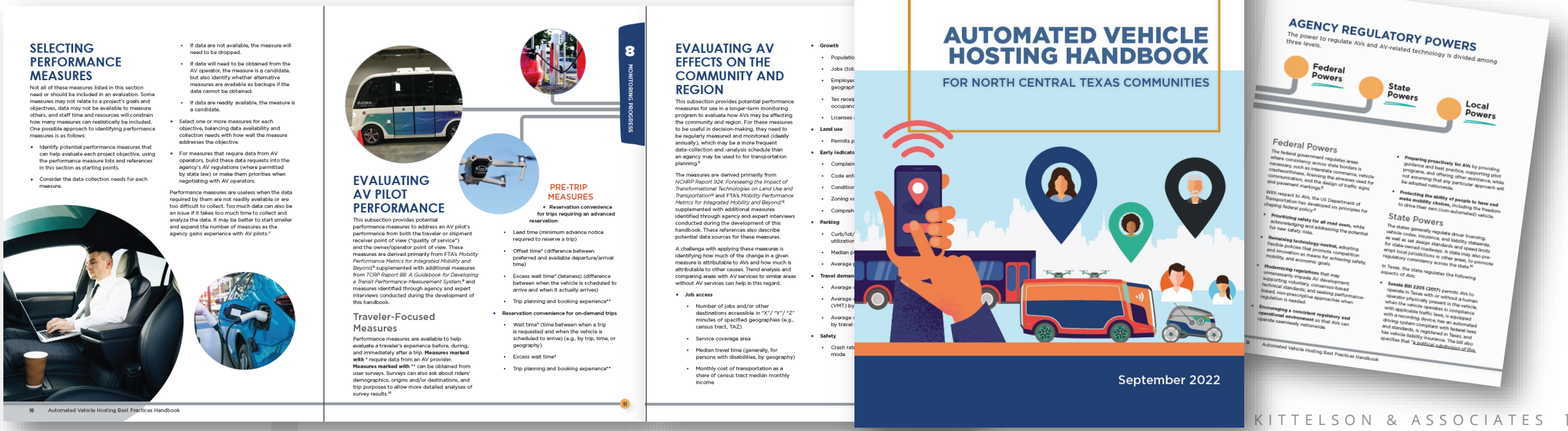
- Vehicle Miles Traveled (VMT) generally *increases*
- Vehicle Hours Traveled (VHT) generally *decreases*
- Average Daily Speed generally *increases*
- Daily Delay generally *decreases*
- CAVs alone will not solve the region's future congestion problems.

NCTCOG AV Hosting Handbook

Key Guidance:

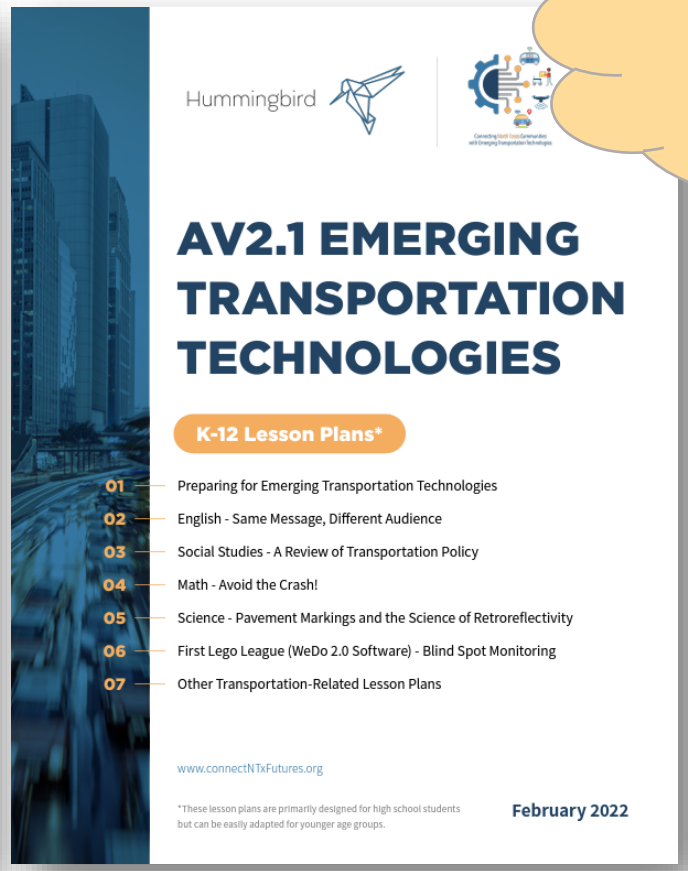
- What is the current state of AV technology?
- What do cities need to know about AVs?
- How can cities prepare for AVs?

What are best-practices for AV deployments?



Public Meetings & K-12 Lesson Plan

Public Meetings



Lesson Plans

How do we excite the next generation about transportation?

01. Planning for Capacity Impacts

02. Regional Readiness

03. **Infrastructure Readiness**

Guidance for Sustainable Integration of Automated Transportation Technologies

AV Pooled Fund Study

Audience: State and local infrastructure owner-operators

Focus: Applications of AVs on public roads

- Passenger cars
- Commercial Trucks
- Transit vehicles
- Personal delivery devices (PDDs)

Uses:

- Developing Goals
- Readiness Assessments
- Deployment Planning
- Long-Range Planning
- Policy & Process Development
- Engagement

Guidebook will be published early 2026

Thank you!

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Scan for NCTCOG Project Website
ConnectNTxFutures.org

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