



# Regional Model Supporting Complete Streets (Context Sensitive Design)

Kevin Kokes | Surface Transportation Technical Committee  
10.28.2022



Multimodal Complete Street

# Complete Streets

Standards or policies that ensure the **safe and adequate accommodation** of all users of the transportation system, including **pedestrians, bicyclists, personal conveyance and micromobility users, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.**

*Source: FHWA's "Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges", March 2022*



# Context Sensitive Design

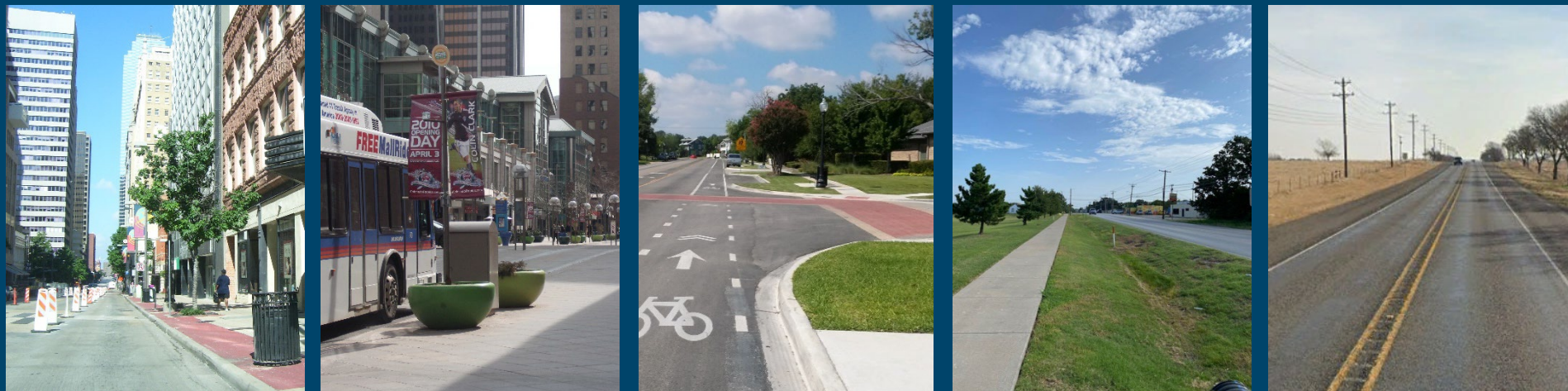
A design process that not only considers physical aspects or standard specifications of a transportation facility, but also the **economic, social, and environmental resources in the community** being served by the facility.

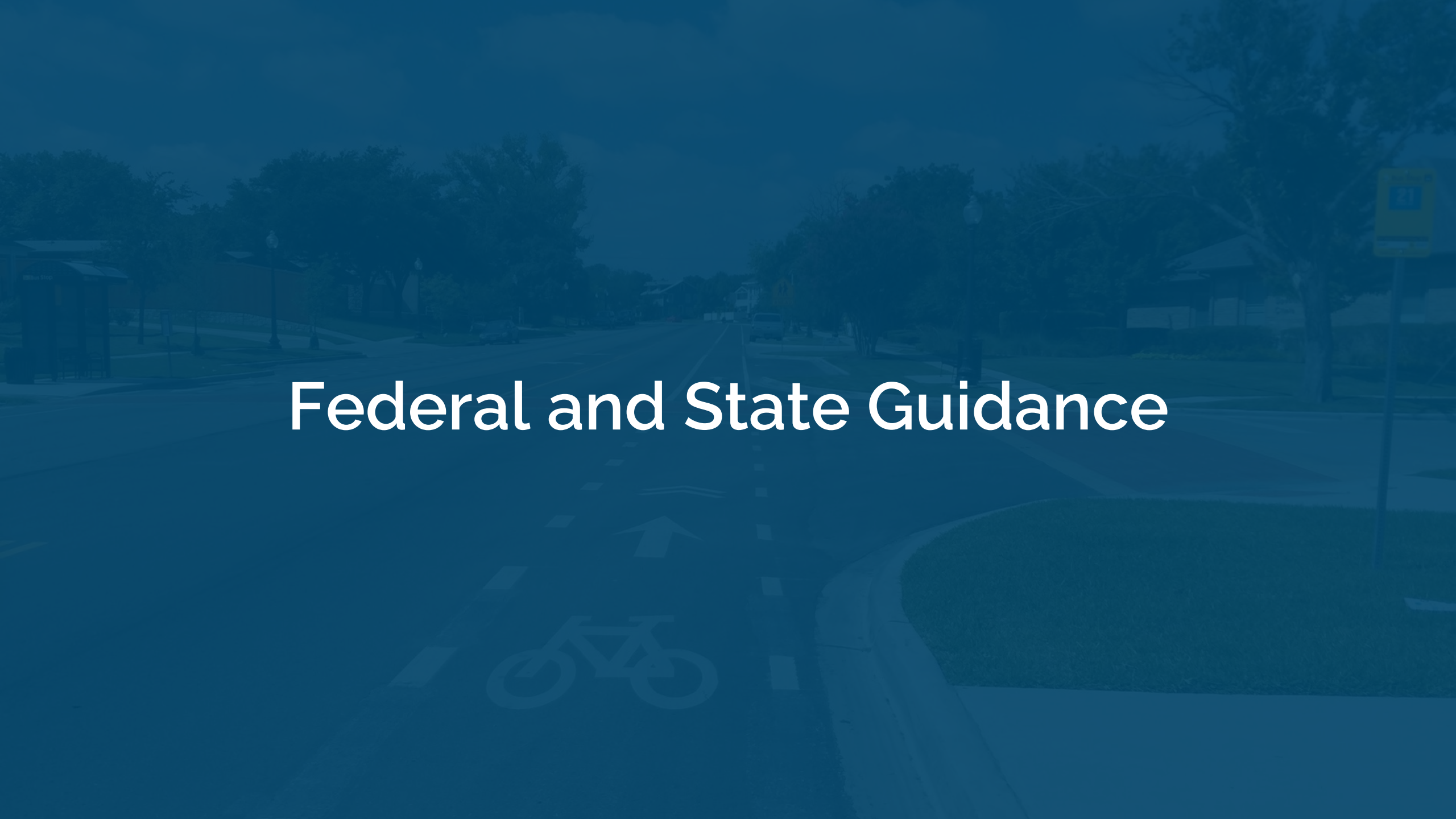
*Source: FHWA, What is Context Sensitive Design*  
[https://www.fhwa.dot.gov/planning/css/what\\_is\\_css/](https://www.fhwa.dot.gov/planning/css/what_is_css/)



## Urbanized Context (Urban Core / Urban / Suburban / Small Town)

## Rural Context





# Federal and State Guidance

# FHWA and FTA Guidance

## Planning Emphasis Areas (PEAs) for MPO and State Planning and Research

Develop tasks in work programs

- Transition to a Clean Energy, Resilient Future
- Equity and Justice in Transportation Planning
- **Complete Streets**
- Public Involvement
- Strategic Highway Network/ Dept of Defense Coordination
- Federal Land Management Agency Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

*Source: USDOT, December 30, 2021*



# FHWA and FTA Guidance

## Complete Streets

### GOAL:

To provide an equitable and safe transportation network for travelers of all ages and abilities, including those from marginalized communities facing historic disinvestment.

*“FHWA and FTA seek to help Federal aid recipients plan, develop, and operate streets and networks that prioritize safety, comfort, and access to destinations for people who use the street network, including pedestrians, bicyclists, transit riders, micro-mobility users, freight delivery services, and motorists. **This vision is not achieved through a one-size-fits-all solution – each complete street is unique and developed to best serve its community context and its primary role in the network.**”*

*Source: USDOT, December 30, 2021*



# Federal Guidance: Bipartisan Infrastructure Law

## Infrastructure Investment and Jobs Act (IIJA)

### Section 11206 Safe and Accessible Transportation Options:

MPOs must spend at least 2.5 percent of funds made available to them under Federal Highway Aid to activities that **increase safe and accessible options for multiple travel modes for people of all ages and abilities**, which may include:

- Adoption of **Complete Streets** standards or policies
- Development of **Complete Streets** prioritization plan
- Development of transportation plans to create active transportation facilities
- Development of transportation plans and policies that support transit-oriented development



# TxDOT Guidance

## Roadway Design Manual (RDM) Update, May 2022

- The updated Ch 6., Sect. 4 Bikeway Facilities emphasizes “**context**” considerations and Bikeway Planning Principles: *safety, comfort, connectivity, and cohesiveness*
- TxDOT Districts now using the updated bicycle facility guidance for new projects
- The Federal Highway Administration approved the RDM updates last summer





# Regional Model

# The purpose of a Complete Streets (Context Sensitive Design) policies and resolutions

- ☐ Provides strategic direction for transportation planning
- ☐ Encourages collaboration regarding transportation functions
- ☐ Incorporates local and regional priorities for mobility  
(not a one-size-fits-all solution)

A Policy/Resolution does NOT:

- ☐ Prescribe solutions for specific streets
- ☐ Mandate immediate retrofits
- ☐ Treat rural areas the same as urban areas



# Approach



## Resolution objectives:

- **Policy:** Support the adoption and implementation of local government policies/resolutions related to “Complete Street/Context Sensitive Design” with local transportation projects
- **Guide:** Checklist and/or Guide for projects with complete street/context sensitive design elements
- **Evaluate:** Review complete street/context sensitive elements in project development and performance measures



# Potential Elements of the Regional Model



Safety



Equity



Multimodal



Context-Sensitive



Technology



Sustainable Design



# Regional Model Resolution

1. The RTC directs staff to collaborate with local governments and transportation providers to develop a Complete Streets (Context Sensitive Design) checklist and/or guide to be used for regional transportation planning and project implementation.
2. The RTC encourages local governments to adopt Complete Streets (Context Sensitive Design) Policies.
3. The RTC encourages local governments to consider Complete Streets (Context Sensitive Design) elements when developing, modifying, or updating local comprehensive plans, thoroughfare plans, local roadway design manuals, zoning and subdivision ordinances, development codes, and other associated rules and/or regulations.
4. The RTC encourages local governments and TxDOT to collaborate closely and implement transportation projects in their jurisdictions that apply context sensitive solutions in a manner consistent with local community characteristics.
5. The RTC directs staff to provide technical support to local governments for development of local Complete Streets policies, resolutions, and methodologies/applications for performance management.



# Next Steps

RTC Resolution  
Supporting a  
Regional Model for  
Complete Streets  
(Context Sensitive  
Design)

Collaboratively  
develop a *draft*  
Checklist/Guide,  
and Performance  
Measures

Updates to  
STTC and RTC

Finalize  
Checklist/Guide and  
Performance  
Measures



# Schedule

| Date                    | Milestone                                        |
|-------------------------|--------------------------------------------------|
| August 2021             | BPAC Briefing                                    |
| August 17, 2022         | BPAC Briefing                                    |
| <b>October 28, 2022</b> | <b>STTC Action</b>                               |
| November 7, 2022        | Public Input Meeting                             |
| November 10, 2022       | RTC Action                                       |
| 2023                    | Develop Guide/Checklist and Performance Measures |



# Requested Action

Recommend Regional Transportation Council  
Approve the Resolution supporting a regional model for complete streets (context sensitive design) and directing staff to develop a complete street checklist/guide and performance measures, to be returned at a future date for approval.



# Staff Contacts:



**Karla Windsor, AICP**

Senior Program Manager

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**Kevin Kokes, AICP**

Program Manager

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**Julie Anderson**

Sr. Transportation Planner

[janderson@nctcog.org](mailto:janderson@nctcog.org)





NCTCOG PRESENTATION

# Advancing Transportation Technologies and Innovative Program

Surface Transportation Technical Committee  
10.28.2022

Natalie Bettger  
Senior Program Manager

# Advanced Transportation Technology and Innovation (ATTAIN) Program

Continuation of Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) program  
\$60M/yr.

5-10 awards up to \$12M apiece

20 percent local match required

[NOFO](#) issued 9/19/22

Applications due: 11/18/22



# ATTAIN Model Deployments

Reduced fatalities and injuries

Reduced traffic congestion/improved travel time reliability

Reduced emissions

Optimized multimodal system performance

Improved access to transportation alternatives

Integration of payment systems

Integrated multimodal transportation information

Transportation-related cost savings



# USDOT ATTAIN Priorities

Climate

Resiliency

Environmental justice

Equity

Removing barriers to opportunity

Job creation



# TSMO Data Engine:

## Foundation for Success

**Description:** A data broker that will consume standard data inputs from applications, enable sharing of data, deploy best-of breed applications and allow each agency the freedom to procure systems that best meet their needs.

**Location:** Regionwide

**Amount:** \$10M

**Local match:** \$2M

**Benefits:** Cost savings, enhanced data sharing, common interfaces, future-proof design, extensibility and high-quality software



# TSMO Data Engine:

## Foundation for Success

### Two Primary Initiatives

- **Data Initiative** to create the digital infrastructure to support advanced smart community technologies and systems within the NCTCOG region
- **Mobility Initiatives** to focus on improving air quality, improve safety, reduce congestion in the region



# Schedule

9/23/22: STTC Briefing / Information

10/13/22: RTC Briefing / Information

10/28/22: STTC Action

11/10/22: RTC Action

11/17/22: NCTCOG Executive Board Action

NCTCOG letters of support requests due: 11/4/22

Contact: [Nicholas Allen](#)



# REQUESTED STTC ACTION

- Request STTC approval of:

Submittal of **TSMO Data Engine** for funding consideration through the FY22 Advanced Transportation Technology and Innovation (ATTAIN) Program (\$8M) and Regional Toll Revenue (RTR) (\$2M) for a total of (\$10M)

Administratively amend NCTCOG and State Transportation Improvement Programs (TIP / STIP), as well as other planning and administrative documents, to include the proposed project if selected for an FY22 ATTAIN Grant total award (\$10M)



# Contacts



**Natalie Bettger [Lead]**

Senior Program Manager  
Congestion Management, Innovative Project  
Delivery and Outreach Program  
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**Thomas Bamonte**

Senior Program Manager  
Transportation Technology & Innovation  
Email: [TBamonte@nctcog.org](mailto:TBamonte@nctcog.org)



**Arash Mirzaei**

Senior Program Manager  
Model and Data Development Program  
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NCTCOG PRESENTATION

# TRANSPORTATION

## SMART Grant Program: Applications

SURFACE TRANSPORTATION TECHNICAL COMMITTEE  
Thomas J. Bamonte  
10.28.2022

# SMART Program & Purpose

**Program:** Strengthening Mobility and Revolutionizing Transportation ([SMART](#)) Grant Program

**Purpose:** Demonstration projects using technology interventions to solve real-world challenges and build data and technology capacity and expertise in the public sector

**Funding:** \$100M/yr.

**First year:** 30-50 planning grants/\$2M maximum grant

**Local match:** None for planning grants

**Later years:** Implementation grants up to \$15M

**Application Deadline:** 11/18/22



# Eligible Projects

Coordinated Automation

Connected Vehicles

Intelligent Sensor-Based Infrastructure

Smart Technology Traffic Signals

Systems Integration

Commerce Delivery and Logistics

Innovative Aviation Technology

Smart Grid for EVs



# SMART: Staff Outreach Efforts

6/21/22: NCTCOG staff briefing

6/28/22: Briefing for STTC members and other regional partners

8/2/22: Distributed notice of USDOT webinar on SMART program

9/20/22: Distributed Notice of Funding Opportunity and schedule

9/23/22: STTC briefing

Various: Multiple brainstorming sessions

NCTCOG letters of support requests due: 11/4/22

Contact: [Nicholas Allen](#)



# Project 1: North Texas Micro-Weather Infrastructure for Advanced Air Mobility

**Description:** Feasibility study to determine viability of regional solution for low altitude weather detection and reporting to support safe deployment of advanced aerial vehicles such as last mile drone delivery services and Electric Vertical Take-off and Landing (eVTOL) vehicles

**Location:** Regionwide

**Amount:** \$2 million

**Local match:** None

**Key Partners:** NASA North Texas Cohort, Hillwood, CASA WX Executive Council, Google Wing, DroneUp, Wisk Aero, Supernal, Overair, City of Arlington, DFWIA

**Benefits:** Will allow regional stakeholders on equitable basis to scale up Advanced Aerial Mobility operations safely



# Project 2: Flooded Roads Information System

**Description:** Use advanced sensors and big data tools to improve prediction, identification, and reporting of flooded roadways.

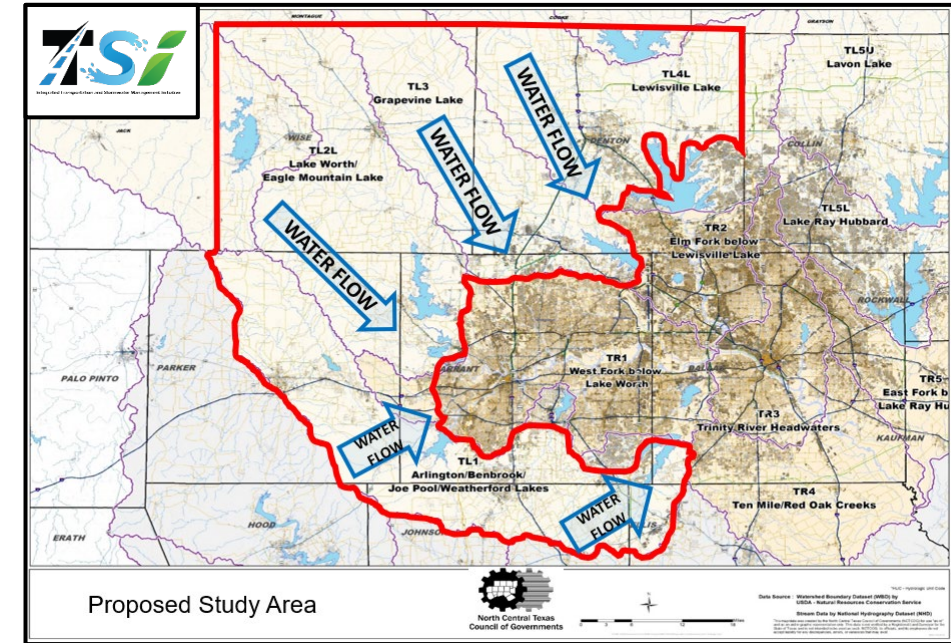
**Location:** TSI Study Area (portions of Dallas, Denton, Ellis, Hood, Johnson, Parker, and Tarrant Counties, and all of Wise County)

**Amount:** \$2 million

**Local match:** None

**Key Partners:** See list at right

**Benefits:** Optimizing emergency response routes/procedures, use of critical facilities, and improving safety at vulnerable areas



# Project 3: Traffic Signal Technology and Deploying AI based ATMS Platforms

**Description:** Leverage NCTCOG's recent survey of traffic signal equipment to identify, test, and evaluate detection and other technologies. Pilot and evaluate multiple platforms to optimize traffic signals

**Location:** Regionwide, US 77, US 67, and FM 1382

**Amount:** \$2 million

**Local match:** None

**Key Partners:** TxDOT, City of Cedar Hill, City of Waxahachie, NCTCOG

**Benefits:** Safety, air quality, congestion, and reliability



# Action Requested

Recommendation for RTC approval (i) of the submission of the three SMART grant applications described above and (ii) for staff to take all necessary steps to submit the applications and administer any grant that is awarded based on the applications.



# Contact



**Thomas Bamonte [SMART Program]**

Senior Program Manager

Transportation Technology & Innovation Program

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NCTCOG PRESENTATION

# UPDATED RULES FOR PUBLIC COMMENT AT REGIONAL TRANSPORTATION COUNCIL MEETINGS

KEN KIRKPATRICK  
SURFACE TRANSPORTATION TECHNICAL COMMITTEE  
10.28.2022

# OVERVIEW OF HB 2840\*

Members of the public must be allowed to make comments to a governmental body before or during the body's consideration of an item

A governmental body may adopt reasonable rules regarding public comments, including rules that limit the amount of time for each public comment

If no simultaneous translation equipment is used, a member of the public using a translator must be given double the amount of time to comment

A governmental body may not prohibit public criticism of the body

Bill took effect on September 1, 2019

\*Texas Government Code Section 551.007



# RULES FOR PUBLIC COMMENTS AT RTC MEETINGS

## Current Rules

- Comments at RTC meetings began in September 2019
- Initial rules adopted March 2020
- Rules are included in the Public Participation Plan as an appendix
- Four public comments have been received to date
- Comments documented in RTC minutes and Public Comments Report

## Updated Rules

- Add decorum standard for audience members and public commenters with clear enforcement rules
- Overall time period limit for public comments, which may be extended
- Clarify when public comments will be in-person or virtual
- Public comment and decorum requirements referenced in RTC Bylaws (proposed)



**September**

Public Meeting

**August**

RTC Information

**October**

RTC Information  
STTC Action

**November**

RTC Action

# TIMELINE

Comments from the public on the updated rules were welcomed for a 45-day period per the Public Participation Plan.



Updated Rules for Public  
Comment at RTC Meetings

# ACTION REQUESTED

Recommend Regional Transportation Council approval of the Updated Rules for Public Comments at RTC Meetings (Electronic Item 6.1).

Amend the Public Participation Plan to include the updated rules as an appendix.



# CONTACT US



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Public Involvement Manager

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Carli Baylor

Communications Supervisor

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## Scenario Planning Outside of Transportation

NEW BUSINESS  
PLANS

BANK  
FINANCIAL  
SOLVENCY TEST

PROFESSIONAL  
SPORTS

MILITARY  
EXERCISES

APPROVAL OF  
NEW MEDICINES

EQUITY AND  
INCLUSION

FINANCIAL  
INVESTMENTS

NASA SPACE  
EXPLORATION

2nd Conference on  
Scenario Planning in Transportation



TRANSPORTATION RESEARCH BOARD

NATIONAL  
ACADEMIES

Science  
Engineering  
Medicine



**CONNECTING NORTH TEXAS COMMUNITIES  
with EMERGING TRANSPORTATION TECHNOLOGIES**

**PROJECT SUMMARY**

**Clint Hail, Transportation Planner  
Transportation Technology & Innovation Program  
Surface Transportation Technical Committee  
October 2022**

# AGENDA

**1** Project Overview

**2** Report Summaries

1

# PROJECT OVERVIEW

# WHAT IS THIS PROJECT?

## What is the need?

Transportation technology is evolving

Our planning process must evolve to keep up

## What is the purpose?

Understand the region's mobility challenges

Identify ways transportation automation and related technologies can address those challenges

Recommend policies and best practices to achieve positive results for the region



# WHAT IS NCTCOG's VISION FOR AUTOMATION IN THE REGION?

- Lead automated vehicle (AV) deployment
- Use automation to achieve region's mobility goals
- Provide communities with AV planning and deployment resources
- Build effective partnerships with AV developers
- Strategically invest in use cases and communities overlooked by AV developers

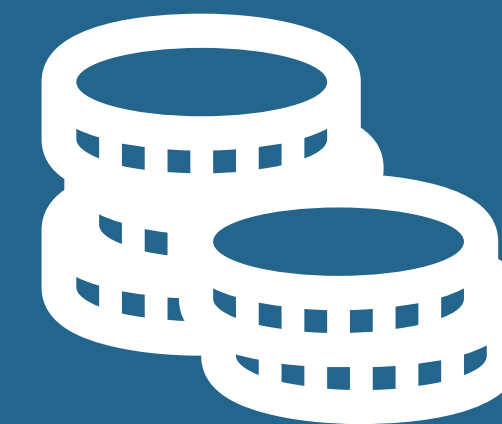
## Goals



Improve Safety  
& Efficiency



Share Real-Time  
Travel  
Information



Improve  
economy



Prioritize quality  
of life

# WHAT IS THE AV2.0 PROGRAM?

## Objectives

-  Make future mobility planning resources available to stakeholders in the region
-  Provide resources for stakeholders to prepare for and support future mobility
-  Look beyond tech available today to plan for future scenarios, impacts

## Planning Horizon

2045

AV2.1

Support for  
planning

2023-  
2025

AV2.2 / 2.3

Support for  
deployment costs

Implement regional-  
strategic investments

# WHAT QUESTIONS DID AV2.1 ANSWER?

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?

# AV2.1 STUDY TEAM



**Abby Morgan, PhD, PE,**  
*Project Manager*  
AV Policy & Impacts



## STAKEHOLDER & PUBLIC ENGAGEMENT



**Leigh Hornsby, PhD**  
Stakeholder  
messaging

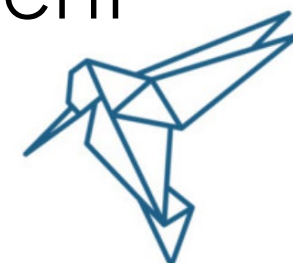


**Royalyn Reid**  
Focus groups



**Denise Smith, PhD**  
Virtual community  
engagement

Hummingbird



## LOCAL & NATIONAL RESEARCH EXPERTS



**Janille Smith-Colin, PhD**  
Future Mobility Needs  
& Impacts



SMU



**John Hicks, AICP**  
AV Policy & Impacts



**Darcy Bullock, PhD**  
AV Hosting Best  
Practices



PURDUE  
UNIVERSITY

## LOCAL PLANNING EXPERTS



**Khaled Abdelghany, PhD**  
AV Scenario  
Development and  
Evaluation



SMU

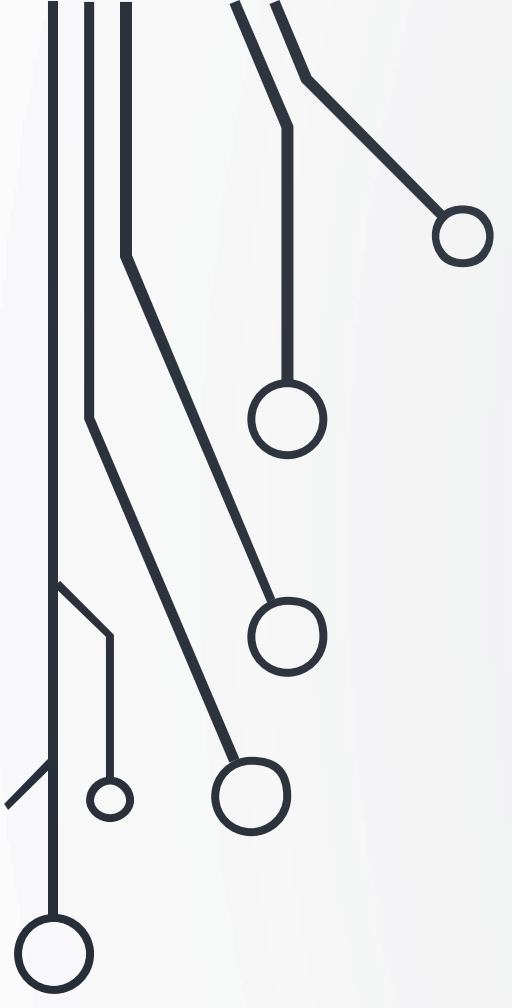


**Mike Chaney**  
NCTCOG Travel  
Demand Modeling



**Behruz Paschai, PhD, PE**  
NCTCOG Travel  
Demand Modeling



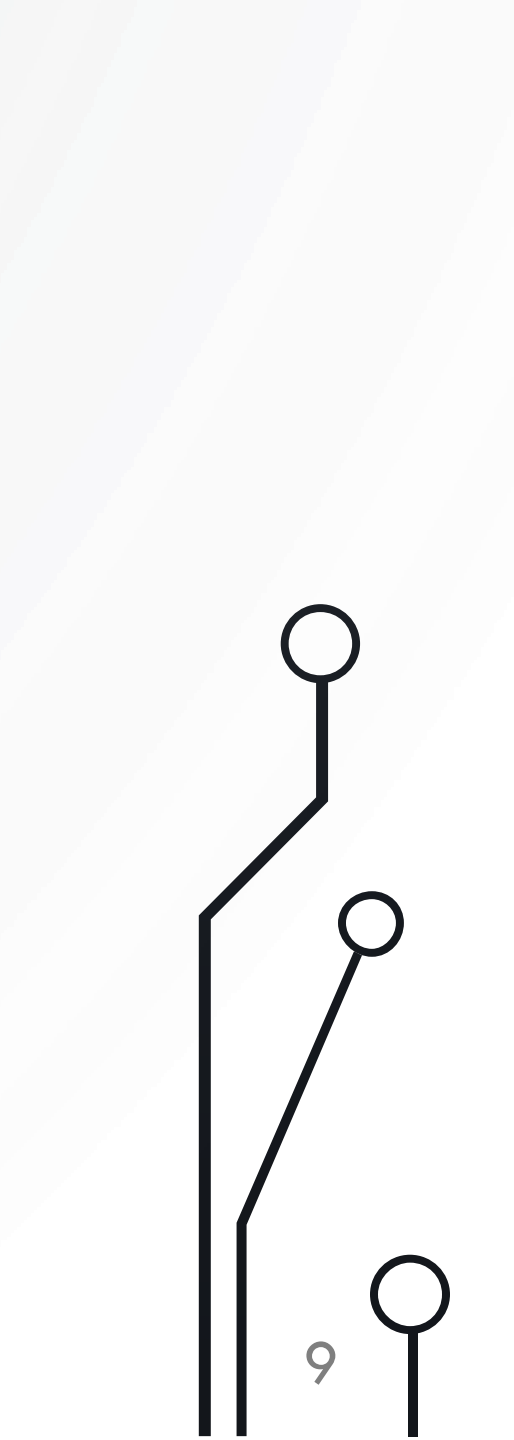
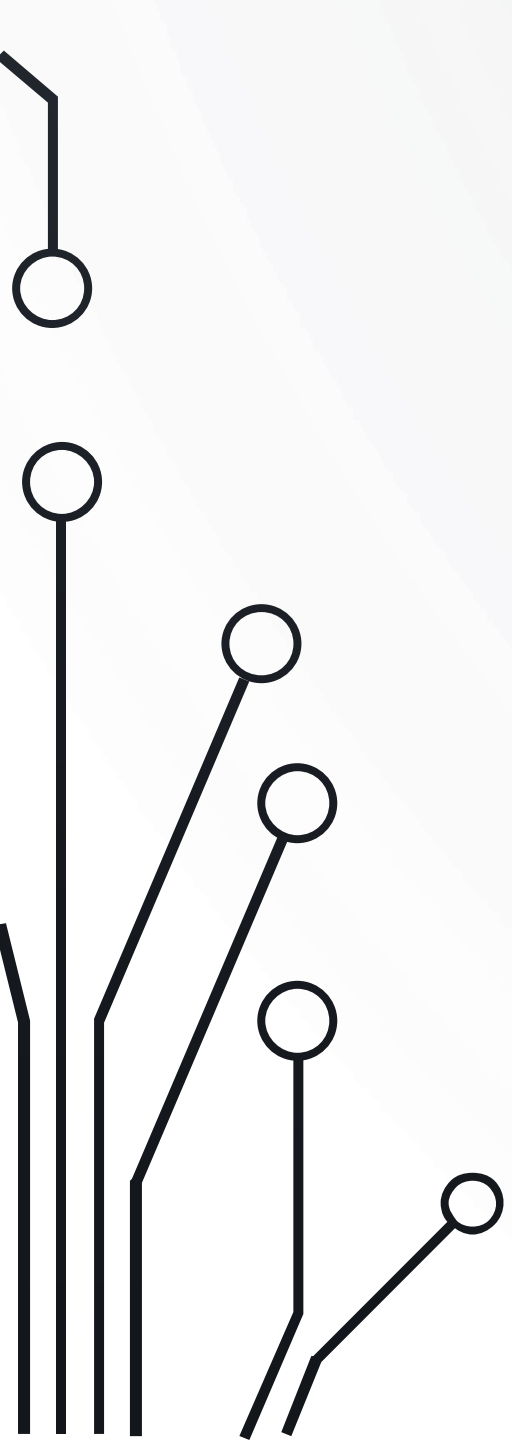


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# PROJECT REPORTS

Available on Project Website:

[www.ConnectNTxFutures.org/Learn](http://www.ConnectNTxFutures.org/Learn)



# PUBLIC MEETINGS & STUDENT LESSON PLAN

[www.ConnectNTxFutures.org/Get-Involved](http://www.ConnectNTxFutures.org/Get-Involved)

**CONNECTING NORTH TEXAS COMMUNITIES with EMERGING TRANSPORTATION TECHNOLOGIES**  
**PUBLIC MEETING #1 RECAP**

**Attendance:** 57 TOTAL

**The Region**

**The Technologies**

**Take a Survey** **YOUR VOICE MATTERS!**

**Three-phase Automated Vehicle 2.0 Program**

- AV2.1 – Planning
- AV2.2 – Partnerships
- AV2.3 – Investments

**Poll Questions**

What is the first thing that comes to mind when you hear the word "transportation"?

Which of these technologies could you see yourself using in the future?

**The Schedule**

|                                                                                                                 |                                                                                                                         |                                                                                                                                  |                                                                                                                                        |                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Public Survey Aug.</b><br>Remember to complete the public survey by August 28th. Share it with your network. | <b>Meetings in a Bag Sep.</b><br>Would you like to bring this information to your constituents or organization members? | <b>PAC Workshops ongoing</b><br>Is your agency or organization interested in attending workshops to learn more about the survey? | <b>Focus Groups Sep.</b><br>We will be talking to a group of people to get their perspectives on emerging transportation technologies. | <b>Public Meetings Jan.</b><br>We will keep you posted on the next virtual public meeting as well as other events. |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|

Public Meeting #1

**Preparing for Emerging Transportation Technologies**

A Panel Discussion on Education and Workforce Development

**Meet the Panel**

**Ernest Huffman**  
Aviation Planning and Education Program Manager  
North Central Texas Council of Governments

**LaKesha Raynor**  
Director, Workforce Development and Apprenticeships Relationship Management  
Dallas College, Cedar Valley Campus

**Kentrel Phillips, Ed.D.**  
Chief Academic Officer  
Everman ISD

**Janille Smith-Colin, Ph.D.**  
Assistant Professor  
Southern Methodist University

**Co-hosts**

**Abby Morgan, Ph.D., P.E.**  
Associate Transportation/Planning Engineer  
Kittelson & Associates, Inc.

**Denise Smith, Ph.D.**  
Director of Community Engagement  
Hummingbird Firm

**Connecting North Texas Communities with Emerging Transportation Technologies**

Public Meeting #2

**Hummingbird**

**AV2.1 EMERGING TRANSPORTATION TECHNOLOGIES**

**K-12 Lesson Plans\***

- 01 Preparing for Emerging Transportation Technologies
- 02 English - Same Message, Different Audience
- 03 Social Studies - A Review of Transportation Policy
- 04 Math - Avoid the Crash!
- 05 Science - Pavement Markings and the Science of Retroreflectivity
- 06 First Lego League (WeDo 2.0 Software) - Blind Spot Monitoring
- 07 Other Transportation-Related Lesson Plans

[www.connectNTxFutures.org](http://www.connectNTxFutures.org)

\*These lesson plans are primarily designed for high school students but can be easily adapted for younger age groups.

**February 2022**

Lesson Plans

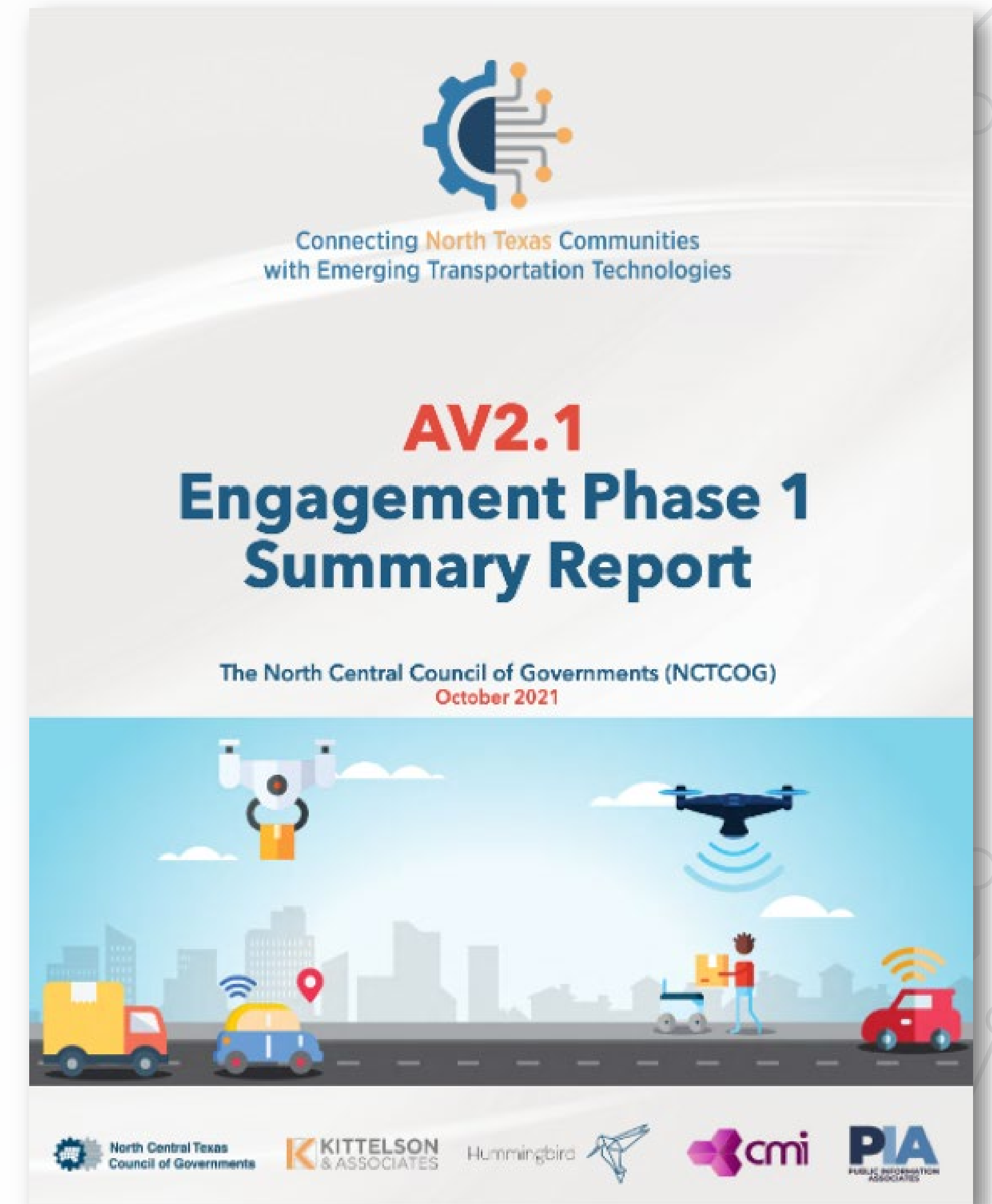
# ONLINE PUBLIC SURVEY

## Purpose

- ◆ Learn public needs and interests around automated transportation

## Key takeaways:

- 483 responses (most from Tarrant and Dallas counties)
- Mixed willingness to use automation technologies for travel around DFW area
- Differences in willingness by race and age
- Older generations less willing to use the technologies



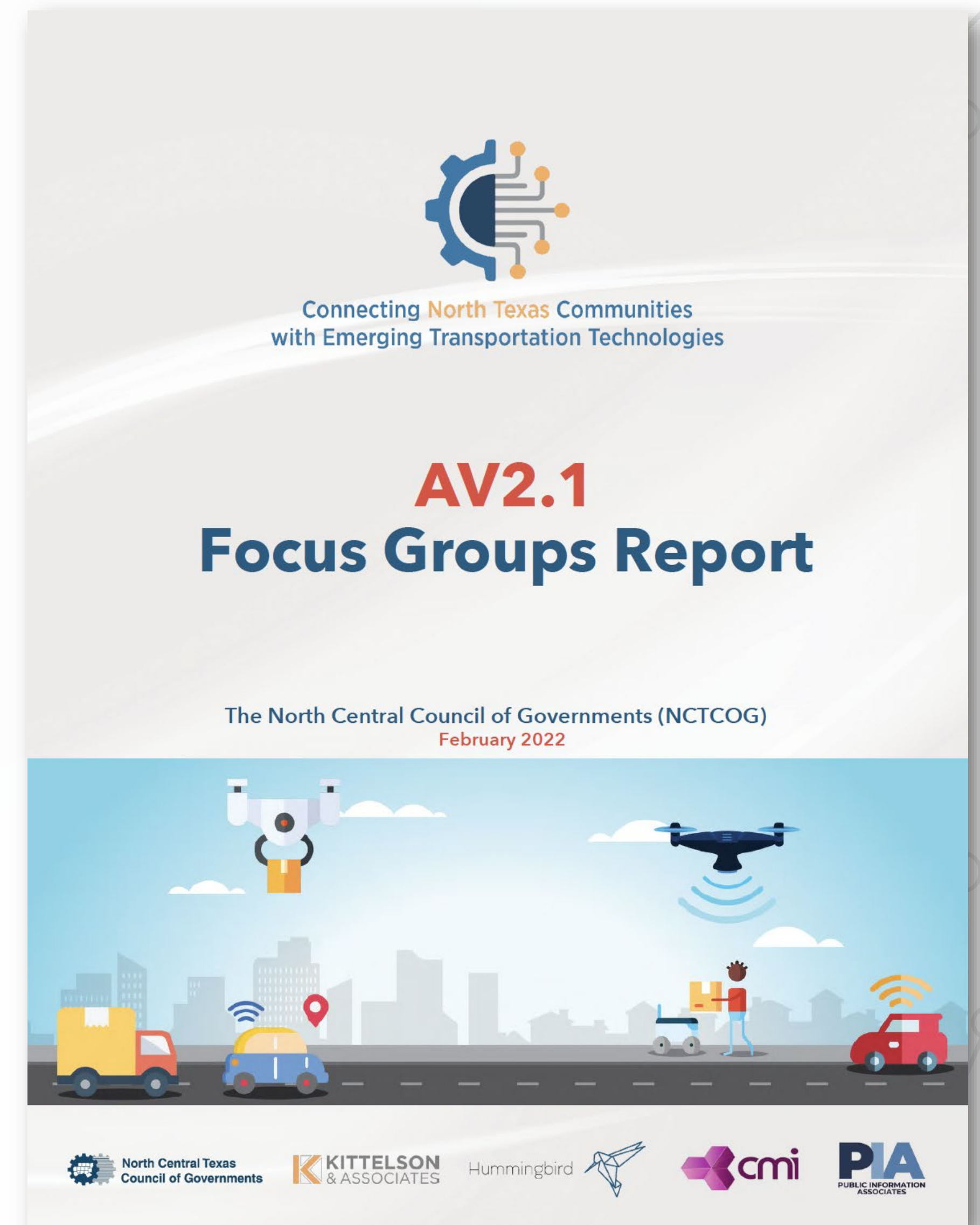
# FOCUS GROUPS

## Purpose

- ◆ Gain deeper awareness of public's perspectives on current and emerging transportation technologies

## Key takeaways:

- 83 participants from 12 focus groups
- Focus group findings align with survey
- Map apps are most used tech (smartphone cost is concern for one minority group)
- Rural residents want more transportation options (transit, ridehail), faster internet, fewer freight train backups
- Minorities most excited about new tech, but doubt fair/equitable access



# STAKEHOLDER & PUBLIC ENGAGEMENT SUMMARY

PAC Meeting Slides & Notes:

[www.connectntxfutures.org/Get-Involved](http://www.connectntxfutures.org/Get-Involved)

## Project Advisory Committee Meetings & Workshops

The Project Advisory Committee (PAC) is a diverse group of stakeholders and subject matter experts, from NCTCOG, local cities and counties, transportation agencies, educational institutions, and transportation-related businesses.

Members of the PAC:

- **Serve** as liaison between COG, project team, and broader communities
- **Represent** subset of region's decision makers and technology users
- **Mentor** next generation of participating agencies
- **Envision** multi-generational planning horizon

While PAC meetings are not open to the public, representatives of local governments are welcome to attend PAC workshops! We also encourage those interested to view the meeting minutes and presentations.

**PAC Meeting 1** - March 12, 2021

[Meeting Minutes](#)

\*\*\*\*\*

**PAC Meeting 2** (Workshop 1) - May 26, 2021

Meeting Minutes ([morning](#) | [afternoon](#))

[Presentation Slides](#)

\*\*\*\*\*

**PAC Meeting 3** (Workshop 2) - July 13, 2021

[Meeting Minutes](#)

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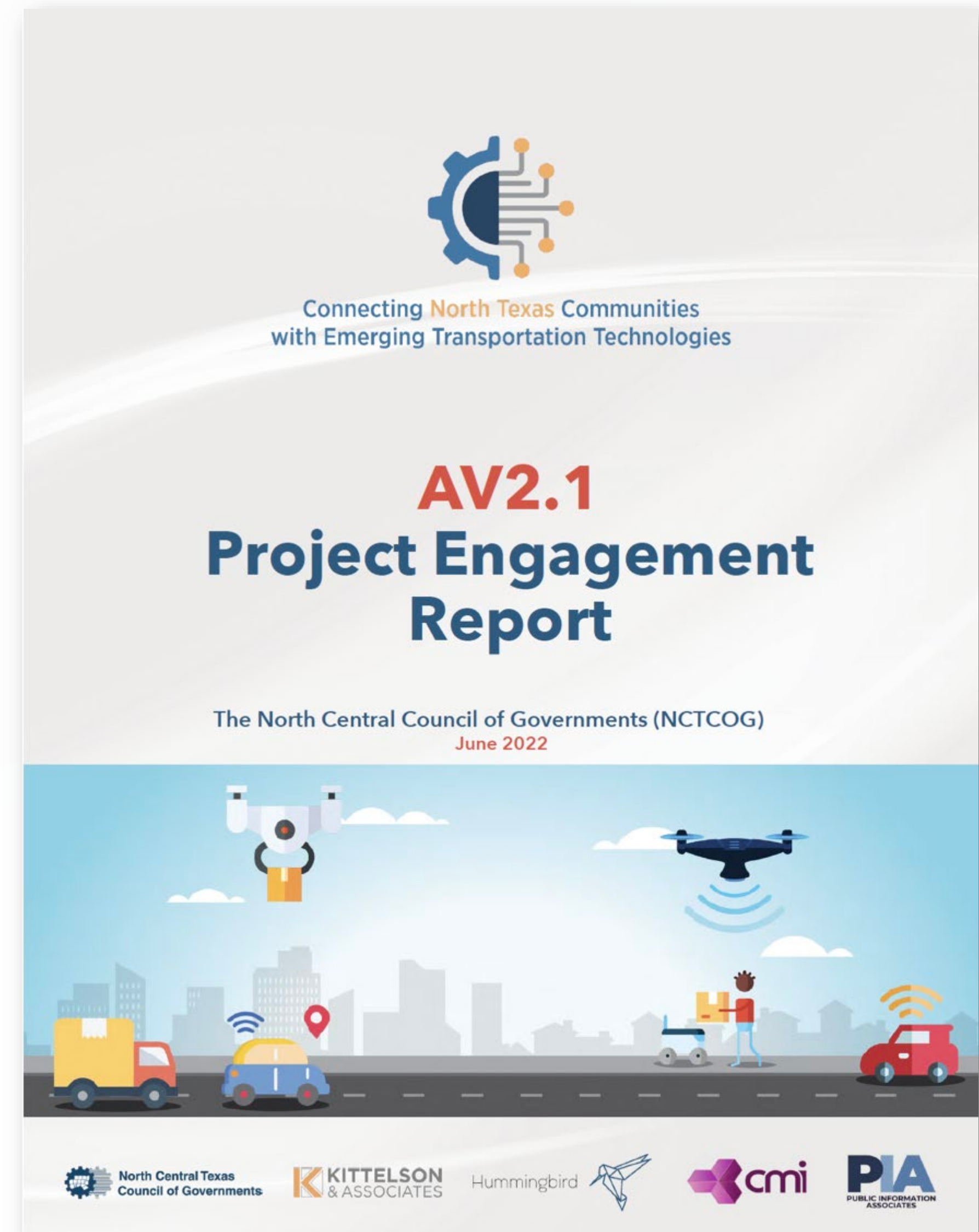
**PAC Meeting 4** (Workshop 3) - Sept 8, 2021

[Meeting Minutes](#)

\*\*\*\*\*

**PAC Meeting 5** - October 27, 2021

[Meeting Minutes](#)



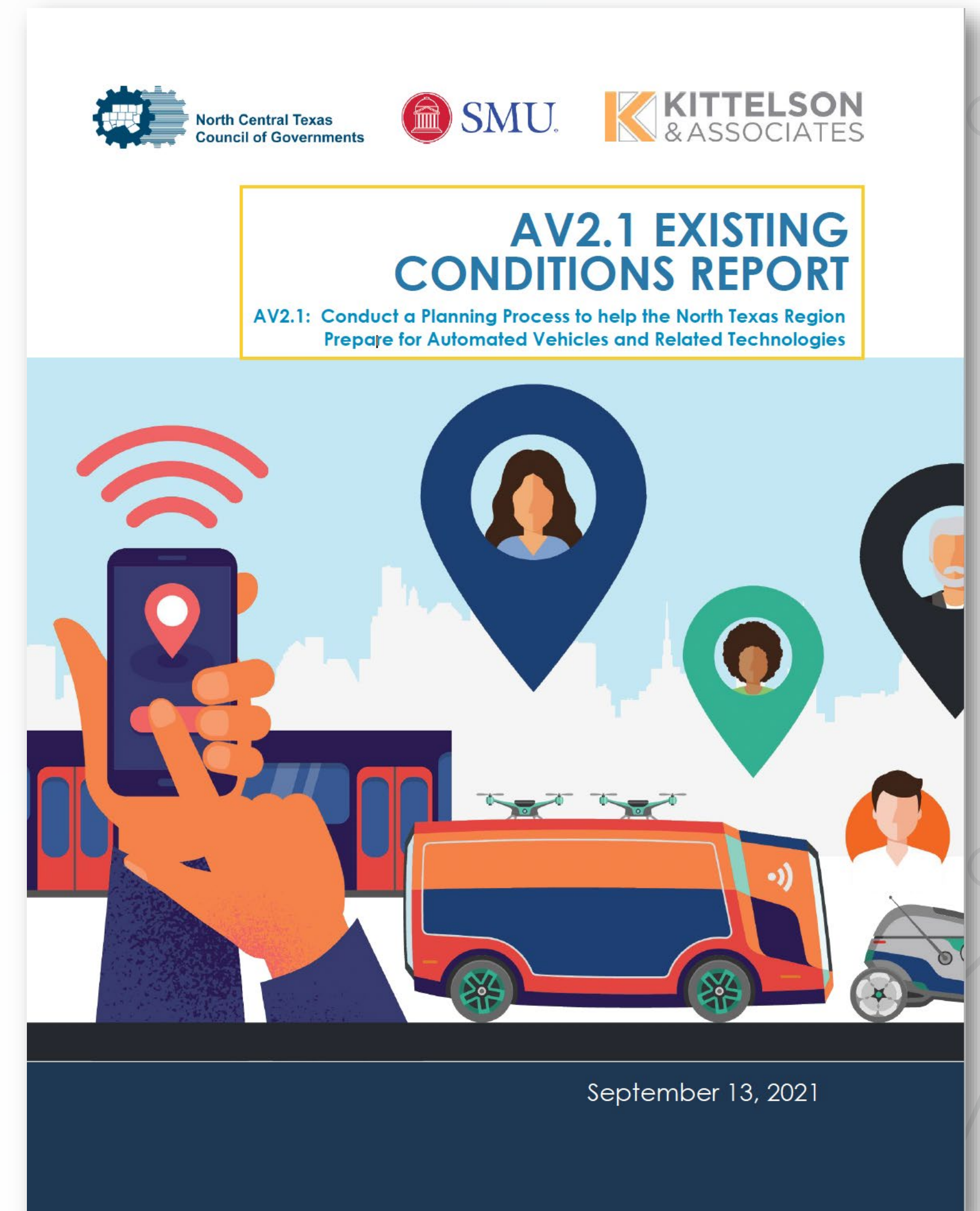
# EXISTING NEEDS

## Purpose

- ◆ Detail current state of transportation in North Central Texas
- ◆ Identify local needs and deployments

## Five categories:

- Personal mobility
- Freight movement
- Equity
- Safety
- Infrastructure readiness + resilience



# MARKET ANALYSIS

## Purpose

- ◆ Understand possible impacts from automated transportation and related technologies in communities.

This understanding and readiness will help the region apply for federal, state, or local deployment funding to deploy or support new technologies.



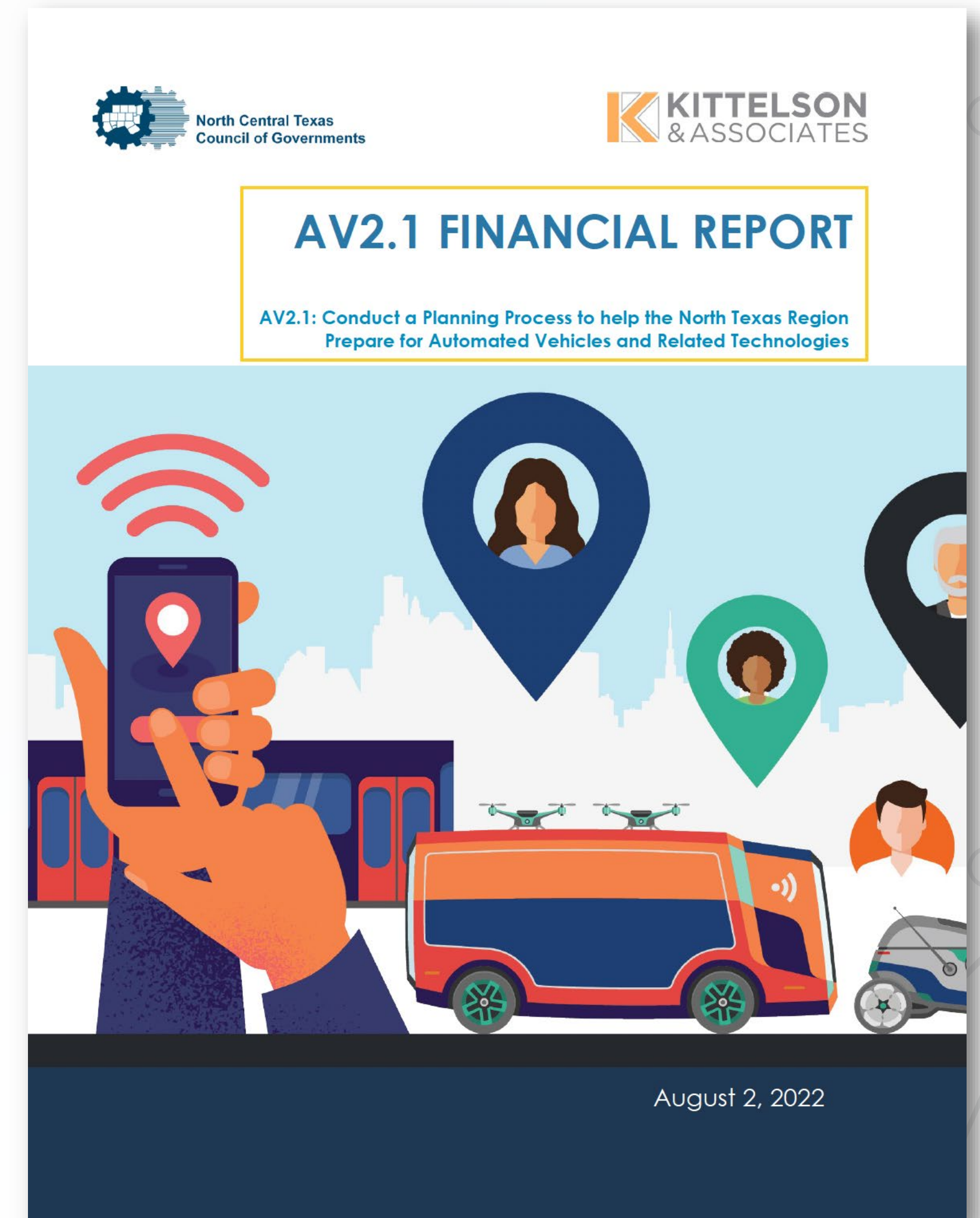
# FINANCIAL REPORT

## Purpose

- ◆ High-level assessment of how automated transportation may affect local entity finances.

Considers Scenario Development and Evaluation to understand potential impacts of automated transportation on existing funding mechanisms available to:

- Counties
- Municipalities
- Public transit agencies
- Airports



# SCENARIO DEVELOPMENT

## Purpose

- ◆ Identify potential future transportation automation scenarios for the North Central Texas region

Developed seven potential scenarios

Selected three scenarios for modeling evaluation:

- Connected Autonomous Vehicle (CAV) Impact on Roadway Network Capacity
- CAV Impact on Intersection Performance
- CAV Impact on Population & Employment Distributions



# MODEL TOOL SELECTION

## Purpose

- ◆ Select the tool(s) to evaluate the three selected scenarios

## Tools Considered:

- Microscopic traffic simulation models
- Mesoscopic simulation-based dynamic traffic assignment models
- Regional travel demand model (“TAFT”) developed and maintained by NCTCOG

Research Team coordinated throughout process with NCTCOG Modeling Team

## Tool Selected:

- AV-TAFT: Regional travel demand model upgraded by UT Austin to enable AV traffic modeling\*

## Modifications:

- CMAV-TAFT: Slightly modified to further upgrade AV-TAFT’s ability to model the three scenarios selected

\* The AV-TAFT model was developed by The University of Texas at Austin Center for Transportation Research under the NCTCOG project Travel Modeling in an Era of Connected and Automated Transportation Systems: An Investigation in the Dallas-Fort Worth Area (2017-2021).

# SCENARIO EVALUATION

## Purpose:

- ◆ Predict potential impacts of three future automation scenarios using travel demand model

## Modeling Summary:

- Studied 29 different scenario runs
- Tested 0, 25, 50, and 100% penetration rates
- First application of new CAV Capacity Adjustment Factors in *Highway Capacity Manual 7<sup>th</sup> 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.

# 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?



Policy Timeframes  
AV-related policies need to consider short-, medium-, and long-term conditions.

### Short Term

**POLICIES FOR THE SHORT TERM**  
In the short term, AV technology is being introduced to a community and is still in a testing and development stage. Policies for this stage can be crafted to that testing occurs safely and that both the agency and the community are kept informed of the progress and outcomes of the testing. If a community desires to attract AV pilot projects and deployments, it can also develop policies to support this goal.

### Medium Term

**POLICIES FOR THE MEDIUM TERM**  
The medium term is a transitional period, where the first generations of commercial AVs have been deployed, but many human-driven vehicles are still in use. Typical estimates of the length of this transitional period range from 30 years after AVs become commercially available to 50 years or more.<sup>25</sup> Importantly, much of the planning period for local and regional transportation plans will occur within this transitional period.  
During the transitional period, the benefits and disadvantages of AVs will become more apparent. Local agencies can begin to set policies now to encourage or discourage the expected benefits, while avoiding the potential negative outcomes. Due to the lack of actual operating experience with commercial AVs, these initial policies will need to be informed by educated guesses about how AV technology will be adopted. Risks associated with uncertainty about how AV conditions will evolve can be mitigated by focusing on incremental actions. Agencies should expect to need to revisit and update AV-related policies relatively frequently as experience is gained.<sup>26</sup>

### Long Term

**POLICIES FOR THE LONG TERM**  
In the long term, AVs have replaced the vast majority of human-driven vehicles. Seeing a human-driven vehicle on the road is as uncommon as seeing an antique or classic car is now.  
When and how this future will occur is impossible to predict. However, agencies can set long-term policies now that describe the kind of community they want to evolve into over time and how AVs might help support that process. In the long term, the policy monitoring and adjustment process that has occurred throughout the medium term will culminate in eliminating policies that are no longer relevant in an AV future and refining other policies based on the decades of experience gained with AV operations.

## SELECTING PERFORMANCE MEASURES

Not all of these measures listed in this section need or should be included in an evaluation. Some measures may not relate to a project's goals and objectives, data may not be available to measure others, and staff time and resources will constrain how many measures can realistically be included. One possible approach to identifying performance measures is as follows:

- Identify potential performance measures that can help evaluate each project objective, using the performance measure lists and references in this section as starting points.
- Consider the data collection needs for each measure.

- If data are not available, the measure will need to be dropped.
- If data will need to be obtained from the AV operator, the measure is a candidate, but also identify whether alternative measures are available as backups if the data cannot be obtained.
- If data are readily available, the measure is a candidate.

- Select one or more measures for each objective, balancing data availability and collection needs with how well the measure addresses the objective.
- For measures that require data from AV operators, build these data requests into the agency's AV regulations (where permitted by state law) or make them priorities when negotiating with AV operators.

Performance measures are useless when the data required by them are not readily available or are too difficult to collect. Too much data can also be an issue if it takes too much time to collect and analyze the data. It may be better to start smaller and expand the number of measures as the agency gains experience with AV pilots.<sup>7</sup>



## EVALUATING AV PILOT PERFORMANCE

This subsection provides potential performance measures to address an AV pilot's performance from both the traveler or shipment receiver point of view ("quality of service") and the owner/operator point of view. These measures are derived primarily from FTA's *Mobility Performance Metrics for Integrated Mobility and Beyond*,<sup>8</sup> supplemented with additional measures from TCRP Report 88: *A Guidebook for Developing a Transit Performance Measurement System*,<sup>9</sup> and measures identified through agency and expert interviews conducted during the development of this handbook.

### Traveler-Focused Measures

Performance measures are available to help evaluate a traveler's experience before, during, and immediately after a trip. Measures marked with \* require data from an AV provider. Measures marked with \*\* can be obtained from user surveys. Surveys can also ask about riders' demographics, origins and/or destinations, and trip purposes to allow more detailed analyses of survey results.<sup>10</sup>

### PRE-TRIP MEASURES

- Reservation convenience for trips requiring an advanced reservation
  - Lead time (minimum advance notice required to reserve a trip)
- Offset time\* (difference between preferred and available departure/arrival time)
- Excess wait time\* (lateness) (difference between when the vehicle is scheduled to arrive and when it actually arrives)
- Trip planning and booking experience\*\*
- Reservation convenience for on-demand trips
  - Wait time\* (time between when a trip is requested and when the vehicle is scheduled to arrive) (e.g., by trip, time, or geography)
  - Excess wait time\*
  - Trip planning and booking experience\*\*

## EVALUATING AV EFFECTS ON THE COMMUNITY AND REGION

This subsection provides potential performance measures for use in a longer-term monitoring program to evaluate how AVs may be affecting the community and region. For these measures to be useful in decision-making, they need to be regularly measured and monitored (ideally annually), which may be a more frequent data-collection and -analysis schedule than an agency may be used to for transportation planning.<sup>11</sup>

The measures are derived primarily from NCHRP Report 924: *Forecasting the Impact of Transformational Technologies on Land Use and Transportation*<sup>12</sup> and FTA's *Mobility Performance Metrics for Integrated Mobility and Beyond*,<sup>13</sup> supplemented with additional measures identified through agency and expert interviews conducted during the development of this handbook. These references also describe potential data sources for these measures.

A challenge with applying these measures is identifying how much of the change in a given measure is attributable to AVs and how much is attributable to other causes. Trend analysis and comparing areas with AV services to similar areas without AV services can help in this regard.

- Job access
  - Number of jobs and/or other destinations accessible in "X"/"Y"/"Z" minutes of specified geographies (e.g., census tract, TAZ)
  - Service coverage area
  - Median travel time (generally, for persons with disabilities, by geography)
  - Monthly cost of transportation as a share of census tract median monthly income

- Growth
  - Population (total, by geography)
  - Jobs (total, by geography)
  - Employed persons (total, by geography)
  - Tax receipts (sales, property, transient occupancy, other)
  - Licenses and permits
- Land use
  - Permits pulled
- Early indicators of code and plan problems
  - Complaints
  - Code enforcement requests
  - Conditional use permits
  - Zoning variance requests
  - Comprehensive plan amendments
- Parking
  - Curb/lot/loading zone parking utilization
  - Median price
  - Average parking duration
- Travel demand
  - Average daily ridership by travel mode
  - Average daily vehicle-miles traveled (VMT) by travel mode
  - Average daily passenger-miles traveled by travel mode
- Safety
  - Crash rate per million VMT by travel mode

## 02 AV APPLICATIONS

This section defines "automated vehicles" and related terms, introduces different types of AVs and the technologies that make AVs possible, and describes potential use cases for AVs.

### DEFINITIONS

#### AUTOMATION

Automation is the "use of electronic or mechanical devices to operate one or more functions of a vehicle without direct human input."<sup>1</sup>

Virtually any type of vehicle—for example, personal vehicles, trucks, buses, mobility scooters, or aerial drones—has the potential to incorporate automation functions. However, the adoption of automation will likely occur faster for some vehicle types and use cases, due to greater potential for cost efficiencies, fewer technological, legal, or liability challenges, or other reasons.

Automation can provide a driver-support role, where it assists a person in driving the vehicle, but the person must supervise the automated feature and perform other driving functions. For example, an adaptive cruise control system uses on-board sensors, such as radar, to detect the distance to the vehicle ahead. The system then makes decisions to slow the vehicle down if needed to keep a safe following distance, or to accelerate and

When envisioning the AV21 program, NCTCOG used the following terminology:

"Automated Vehicle" or "AV" refers to both connected and autonomous vehicles. The term is inclusive of technologies that are precursors to the introduction of AVs, such as emerging modes of micromobility and rideshare, and related to AVs, such as vehicle-to-infrastructure technology.

## AGENCY REGULATORY POWERS

The power to regulate AVs and AV-related technology is divided among three levels.

### Federal Powers

The federal government regulates areas where consistency across state borders is necessary, such as interstate commerce, vehicle crashworthiness, licensing the airwaves used for communication, and the design of traffic signs and pavement markings.<sup>2</sup>

With respect to AVs, the US Department of Transportation has developed six principles for shaping federal policy:<sup>3</sup>

- Prioritizing safety for all road users, while acknowledging and addressing the potential for new safety risks.
- Remaining technology-neutral, adopting flexible policies that promote competition, innovation as means for achieving safety, mobility, and economic goals.
- Modernizing regulations that may unnecessarily impede AV development; supporting voluntary, consensus-based technical standards; and seeking performance-based, non-prescriptive approaches when regulation is needed.
- Encouraging a consistent regulatory and operational environment so that AVs can operate seamlessly nationwide.

### State Powers

The states generally regulate driver licensing, vehicle codes, insurance, and liability statewide, as well as set design standards and speed limits for state-owned roadways. A state may also promulgate local jurisdictions in other areas, to promote regulatory consistency across the state.<sup>4</sup>

In Texas, the state regulates the following aspects of AVs:

- Senate Bill 2205 (2017) permits AVs to operate in Texas with or without a human operator physically present in the vehicle, when the vehicle operates in compliance with applicable traffic laws, is equipped with a recording device, has an automated driving system compliant with federal laws and standards, is registered in Texas, and has vehicle liability insurance. The bill also specifies that "a political subdivision of this state may not regulate the operation of an AV in a manner that is inconsistent with the provisions of this bill."

### Local Powers

Preparing proactively for AVs by providing guidance and best practice, supporting pilot programs, and offering other assistance, while not assuming that any particular approach will be adopted nationwide.

Protecting the ability of people to have and drive their own (non-automated) vehicle.

# FINAL REPORT

## Purpose

- ◆ Summarize key findings from each project task
- ◆ Recommend next steps for municipalities and NCTCOG

## Key Recommendations:

- Self-assess gaps (staffing, planning, infrastructure, policy)
- Pursue funding opportunities
- Disseminate key findings
- Continue to monitor trends (technology and impacts)
- Develop financial revenue assessment toolkit
- Develop tools to evaluate pilots and prioritize new projects or investments



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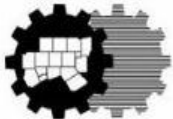
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# **FISCAL YEAR 2022 & 2023 PROJECT TRACKING**

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Surface Transportation Technical Committee

October 28, 2022



North Central Texas  
Council of Governments  
Transportation Department

# BACKGROUND

- Due to significant implementation delays on projects across the region and a need to draw down the region's carryover balances the TIP team performs a robust project tracking effort in order to highlight potential problems and prevent delays.
- At the beginning of the fiscal year, staff provided the Surface Transportation Technical Committee (STTC) and the Regional Transportation Council (RTC) with a list of projects (by phase) scheduled to advance during the coming year.
- Agencies are being asked to report project status on a more frequent basis.
- The status of projects scheduled for the year will continue to be presented at STTC and RTC on a regular basis.
- This will provide opportunities for sponsors to raise issues that may be hindering project progress and help ensure funds are being obligated in a more timely manner.

# SUMMARY OF TIP FY2022 PROJECT FUNDING - CMAQ

|                                                                      | OCTOBER<br>2021 | SEPTEMBER<br>2022 |
|----------------------------------------------------------------------|-----------------|-------------------|
| Total Federal Funding Programmed <sup>1</sup>                        | \$70,669,684    | \$83,993,969      |
| Federal Funding Obligated (2022) <sup>2, 3</sup>                     | \$0             | \$83,402,443      |
| FY2022 Project Phases <sup>4</sup>                                   | 44              | 14                |
| Project Phases Obligated to Date                                     | 0               | 14                |
| Project Phases Past Their Original Estimated Start Date <sup>5</sup> | 4               | 36                |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early obligations/advancing projects or delaying projects to future years)

2. Obligations based on the federal fiscal year, which runs from October to September

3. Obligation amounts as of 09/30/2022

4. 36 project phases have been or will be delayed to future years through TIP actions or were canceled and 6 phases were advanced to 2022

5. Includes projects that were initially in FY2022 and have been delayed to a later year

The region obligated more funding than was programmed at the beginning of the fiscal year as a result of a TxDOT project being let on time, and despite 36 projects not obligating as expected.

# SUMMARY OF TIP FY2022 PROJECT FUNDING - STBG

|                                                                      | OCTOBER<br>2021 | SEPTEMBER<br>2022 |
|----------------------------------------------------------------------|-----------------|-------------------|
| Total Federal Funding Programmed <sup>1</sup>                        | \$178,455,967   | \$155,518,801     |
| Federal Funding Obligated (2022) <sup>2, 3</sup>                     | \$0             | \$155,518,801     |
| FY2022 Project Phases <sup>4</sup>                                   | 77              | 28                |
| Project Phases Obligated to Date                                     | 0               | 28                |
| Project Phases Past Their Original Estimated Start Date <sup>5</sup> | 3               | 52                |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early obligations/advancing projects or delaying projects to future years)

2. Obligations based on the federal fiscal year, which runs from October to September

3. Obligation amounts as of 09/30/2022

4. 52 project phases have been or will be delayed to future years through TIP actions or were canceled and 3 phases were advanced to 2022

5. Includes projects that were initially in FY2022 and have been delayed to a later year

Despite 52 project phases not obligating as expected, 87% of STBG was obligated due to the Category 2/STBG funding exchange.

# SUMMARY OF TIP FY2022 PROJECT FUNDING – TRANSPORTATION ALTERNATIVES SET ASIDE

|                                                                      | OCTOBER<br>2021 | SEPTEMBER<br>2022 |
|----------------------------------------------------------------------|-----------------|-------------------|
| Total Federal Funding Programmed <sup>1</sup>                        | \$17,356,430    | \$8,661,010       |
| Federal Funding Obligated (2022) <sup>2, 3</sup>                     | \$0             | \$8,150,643       |
| FY2022 Project Phases <sup>4</sup>                                   | 18              | 8                 |
| Project Phases Obligated to Date                                     | 0               | 8                 |
| Project Phases Past Their Original Estimated Start Date <sup>5</sup> | 0               | 11                |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early

obligations/advancing projects or delaying to future years)

2. Obligations based on the federal fiscal year, which runs from October to September

3. Obligation amounts as of 09/30/2022

4. 11 project phases have been or will be delayed to future years in the TIP and one was advanced from 2023

5. Includes projects that were initially in FY2022 and have been delayed to a later year

While the region was able to obligate enough funding to avoid federal funding lapse, 11 project phases were delayed leading to a sizeable carryover balance.

# SUMMARY OF TIP FY2023 PROJECT FUNDING - CMAQ

|                                                  | OCTOBER 2022  |
|--------------------------------------------------|---------------|
| Total Federal Funding Programmed <sup>1</sup>    | \$137,223,374 |
| Federal Funding Obligated (2023) <sup>2, 3</sup> | \$0           |
| FY 2023 Project Phases                           | 37            |
| Project Phases Obligated to Date                 | 0             |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early obligations or delaying projects to future years)
2. Obligations based on the federal fiscal year, which runs from October to September
3. Obligation amounts as of 10/18/2022

# SUMMARY OF TIP FY2023 PROJECT FUNDING - STBG

|                                                  | OCTOBER 2022  |
|--------------------------------------------------|---------------|
| Total Federal Funding Programmed <sup>1</sup>    | \$178,908,388 |
| Federal Funding Obligated (2023) <sup>2, 3</sup> | \$0           |
| FY 2023 Project Phases                           | 75            |
| Project Phases Obligated to Date                 | 0             |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early obligations or delaying projects to future years)
2. Obligations based on the federal fiscal year, which runs from October to September
3. Obligation amounts as of 10/18/2022

# SUMMARY OF TIP FY2023 PROJECT FUNDING – TRANSPORTATION ALTERNATIVES SET ASIDE

|                                                  | OCTOBER 2022 |
|--------------------------------------------------|--------------|
| Total Federal Funding Programmed <sup>1</sup>    | \$19,963,595 |
| Federal Funding Obligated (2023) <sup>2, 3</sup> | \$0          |
| FY 2023 Project Phases                           | 20           |
| Project Phases Obligated to Date                 | 0            |

1. Programmed funding is comprised of what is included in the TIP as well as transactions that have not formally been made in the TIP (e.g., early obligations or delaying projects to future years)
2. Obligations based on the federal fiscal year, which runs from October to September
3. Obligation amounts as of 10/18/2022

# NEXT STEPS

- Continue monitoring project progress
- Work with project sponsors and TxDOT to resolve issues that may be causing delays in project implementation
- Bring updates to the committees throughout the fiscal year

# QUESTIONS?

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