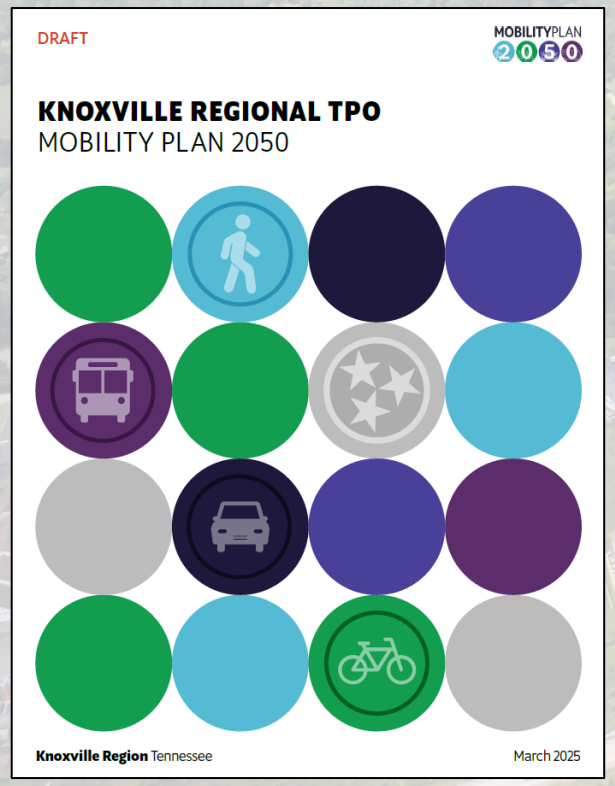
MOBILITYPLAN 2050



Knoxville TPO 2050 MTP Update

Community **Virtual** Mtg – Lunch & Learn

Tuesday, April 8, 2025

Who is the…

tpo
KNOXVILLE REGIONAL

Knoxville TPO

Doug Burton
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Craig Luebke
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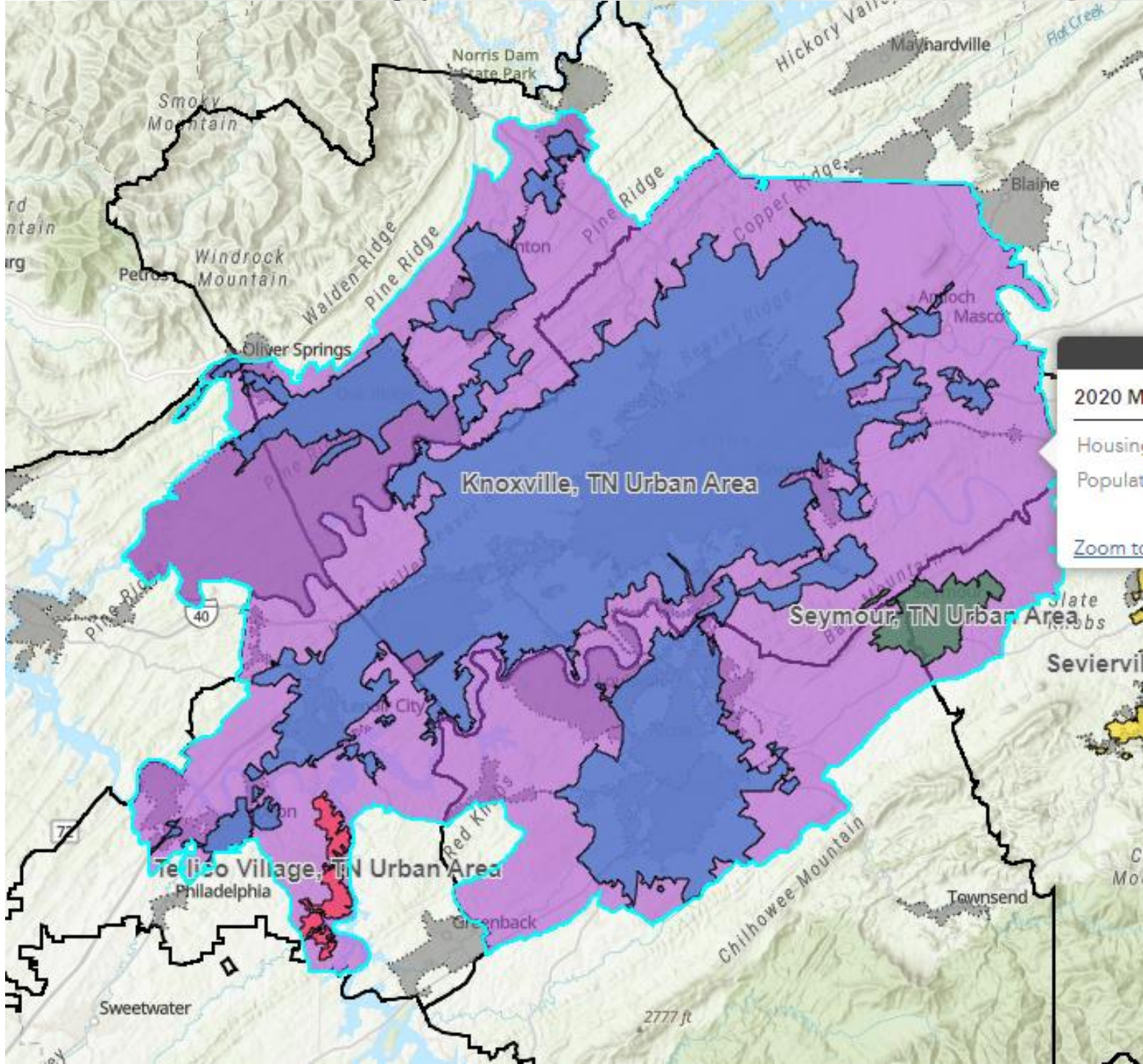


Our Project Teammates

tpo
KNOXVILLE REGIONAL

TN TDOT
Department of Transportation

Federal Highway Administration

Stantec

Planning
KNOXVILLE | KNOX COUNTY

Federal Transit Administration

alta

Wilmot

kat
KNOXVILLE AREA TRANSIT

ethra
East Tennessee Human Resource Agency

LOUDON COUNTY

LOUDON COUNTY TN

BLOUNT COUNTY EDUCATION RELIGION 1795 INDUSTRY TENNESSEE

SEAL OF THE CITY OF OAK RIDGE TENNESSEE

farragut TENNESSEE

City of MARYVILLE
PEOPLE are the KEY

TOWN OF LOUISVILLE 1990 1851 - 1860

CTR

Knoxville-Knox County CAC
Community Action Committee
Helping People. Changing Lives.

ANDERSON COUNTY TENNESSEE 1801

Roane County TENNESSEE

Lenoir City TENNESSEE

LOUDON TENNESSEE 1817

CLINTON 1890 TENNESSEE

CITY OF ALCOA

etdd
east tennessee development district

MOBILITYPLAN 2050

We've Made It!

WE ARE HERE!

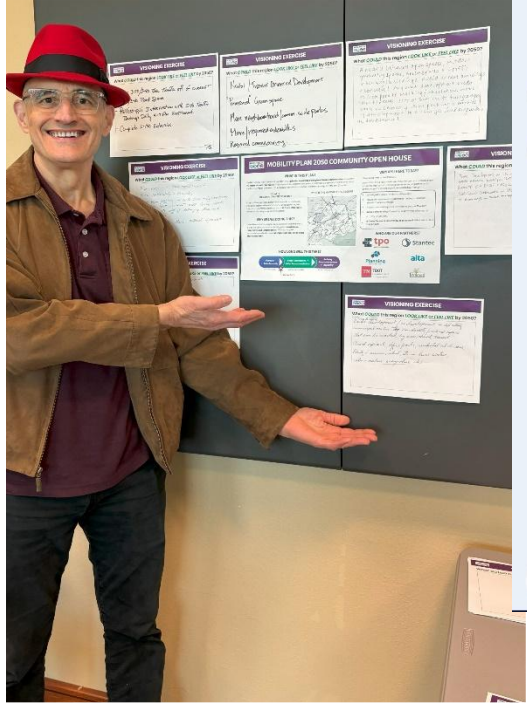
Fall / Winter 2023 — Feb 2024 — Spring / Summer 2024 — Oct 2024 — Winter / Spring 2025

- ☑ **Public Outreach – Round #1**
  - ☑ Digital and In-person events
- ☑ Existing Conditions assembly / review
- ☑ Regional vision / goals

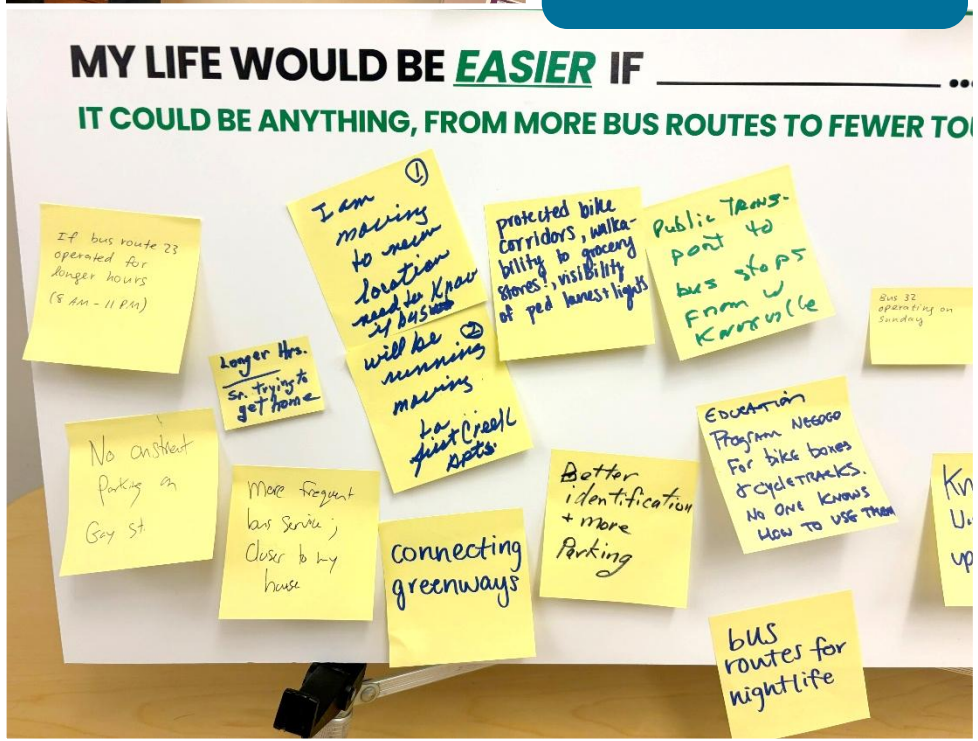
- ☑ Review of Performance Measures
- ☑ Financial projections to 2050
- ☑ Project review / audit
- ☑ New project needs
- ☑ Project Lists / Maps – all modes

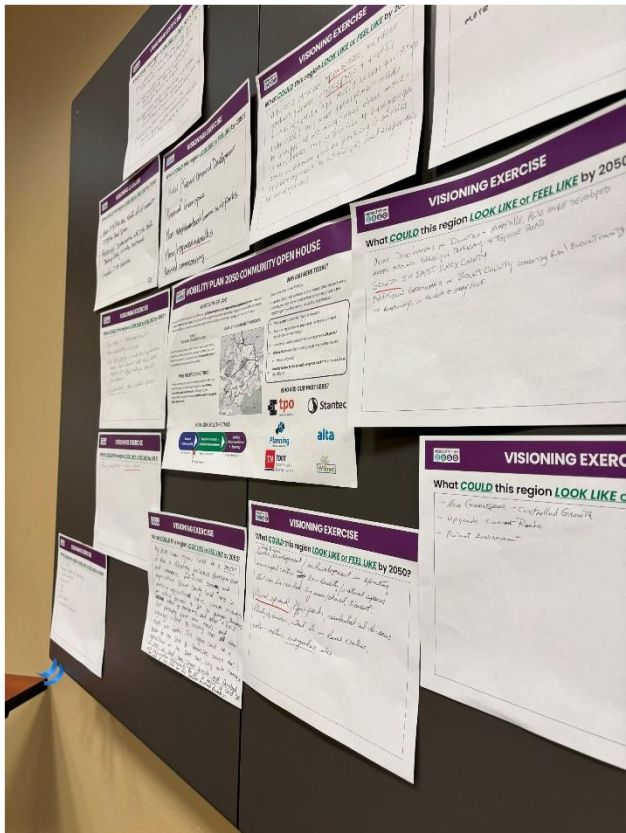
- ☑ **Public Outreach – Round #2**
- ☑ Draft Plan
  - ☑ TDOT review
  - FHWA review
  - Public Comment Period (30-day)
- Final Plan / **Adoption 4/30**

MOBILITYPLAN 2050

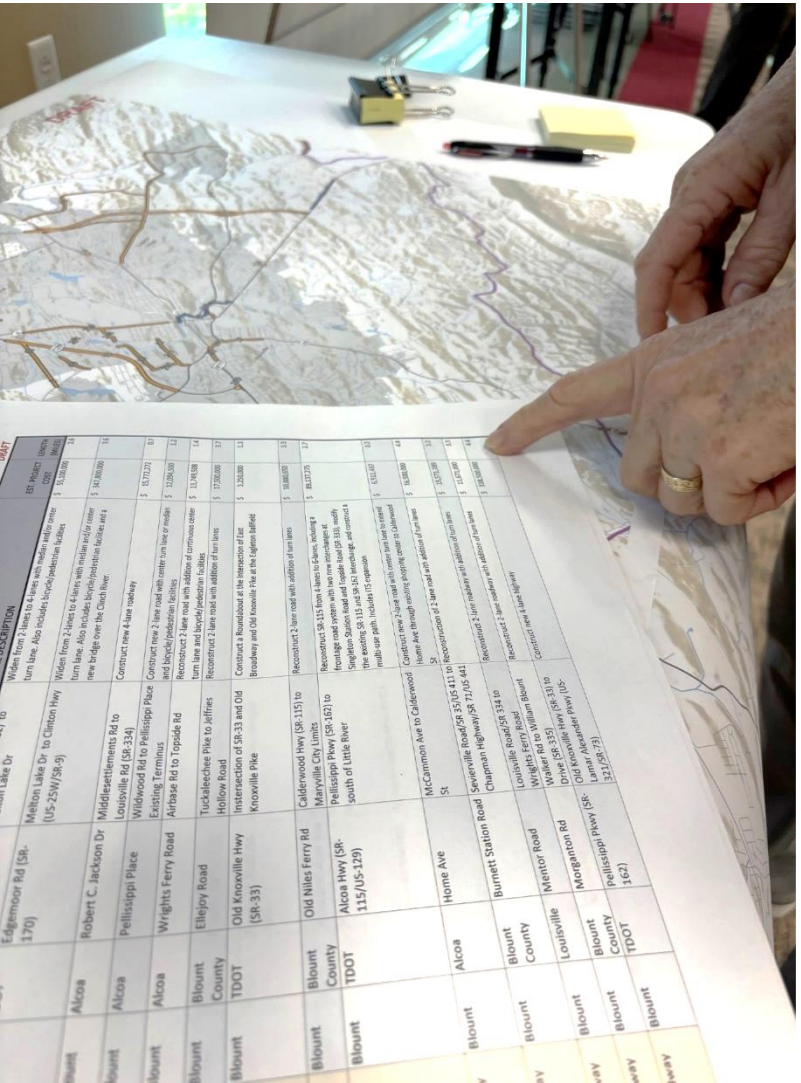


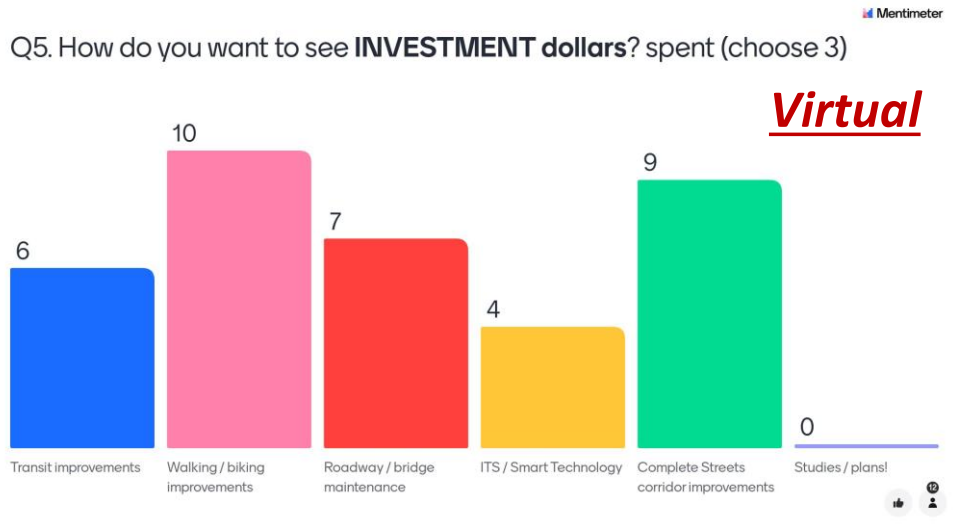
Community Event – Round #1





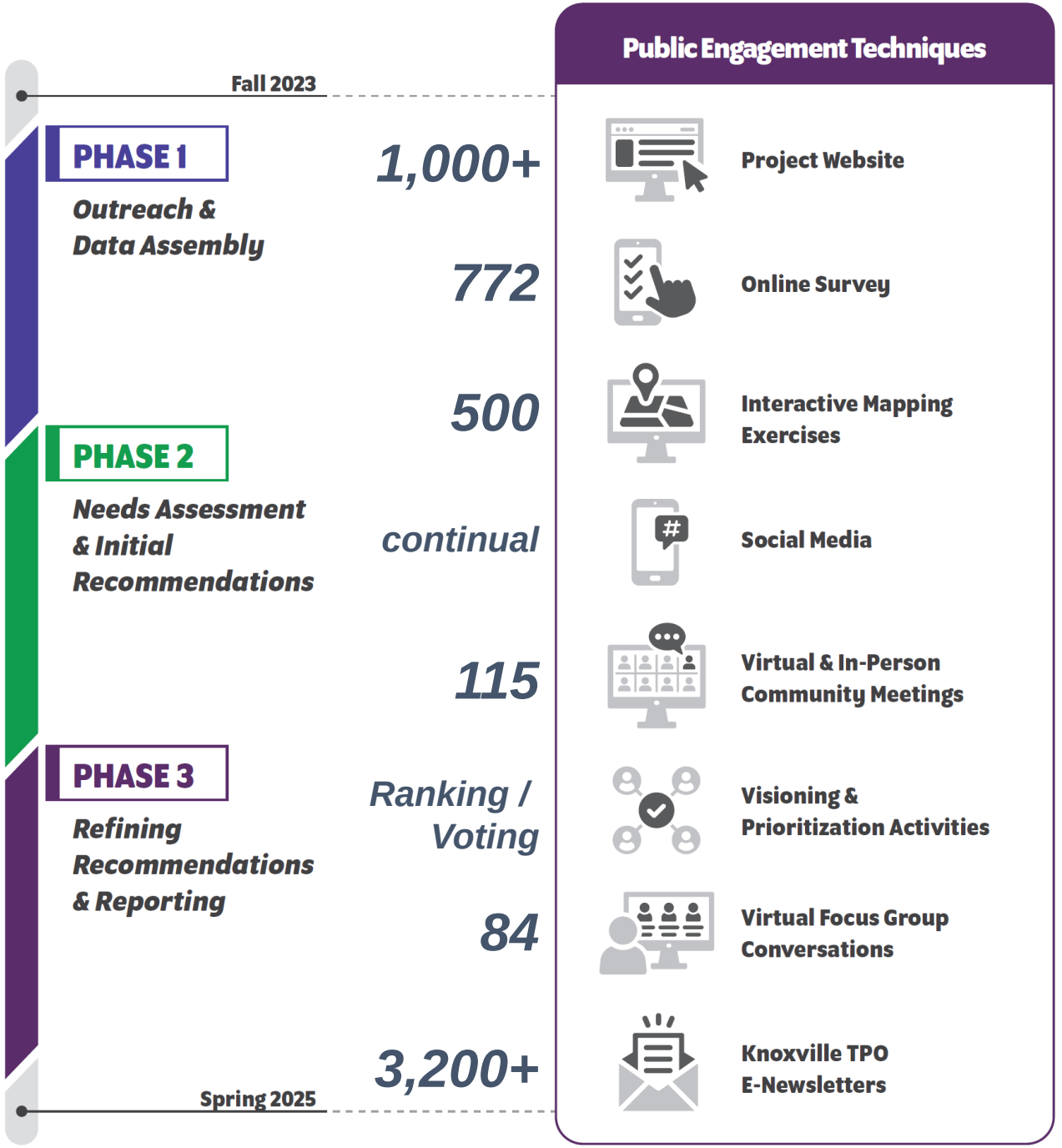
Community Event Round #2





Outreach Process

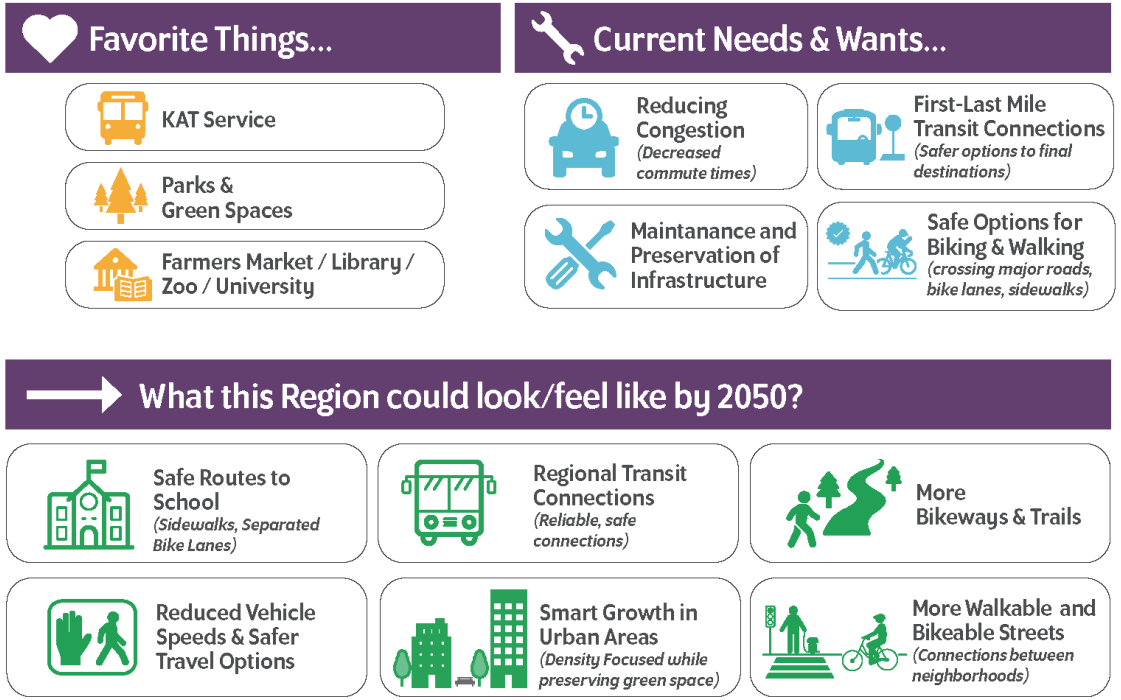
- **Virtual** and **In-Person** engagement
  - Fall 2023 to Spring 2025
- Many touchpoints



MOBILITYP

Figure 1.3: Project timeline and public engagement techniques

YOU told us …



We **used** this to …

- **understand** destinations (end of trip) and regionally important places
- **validate** near-term mobility needs or projects
- **emphasize** safety for all modes
- **prioritize** long-term mobility projects
- **integrate** development needs (growth) with transportation needs

MOBILITYPLAN 2050

YOU told us …

- **Ranking** of goals (1-8)
- Most pressing mobility problems
- Project types to fund
- Open-ended comments

We **used** this to …

Prioritize project scoring

Goal	Small & Local Projects	Large & Regional Projects	Evaluation Criteria Datasets
Safety & Security	21%	17%	Percent project length on High Injury Network Tier 1
			Percent project length on High Injury Network Tier 2
			Interactive Map points "Speeding" or "Safety"
Congestion Reduction	15%	19%	Level of Travel Time Reliability (LOTTR) Value
			Expected volume over capacity (V/C)
			Interactive Map points "Congestion"
Maintenance & Efficiency	14%	15%	Crosses a Bridge rated as "Poor" or "Critical Condition"
			Interactive Map points "Maintenance"
Health & Environment	13%	12%	Proximity to existing high-quality bikeway or pedway facilities
			Avoids potential impact with environmental resources
Equitable Access	11%	9%	Priority Population Index average value (vulnerable)
			USDOT defined area of Persistent Poverty
More Options	10%	6%	Population density of transit service
			Connected with existing transit service area
			Interactive Map points "Barrier to walking/biking"
Preservation of Place	8%	8%	Avoids potential impact with cultural resources
Economy of Freight	8%	14%	Density of freight facilities nearby
Local Priority			Project identified in other local plans *(not quantifiable)*

Table 3.4: Evaluation Criteria for Project Prioritization

YOU told us …

- Ranking of goals (1-8)
- Most pressing **mobility problems**
- Project types to fund
- Open-ended comments

We **used** this to …

Address existing needs first

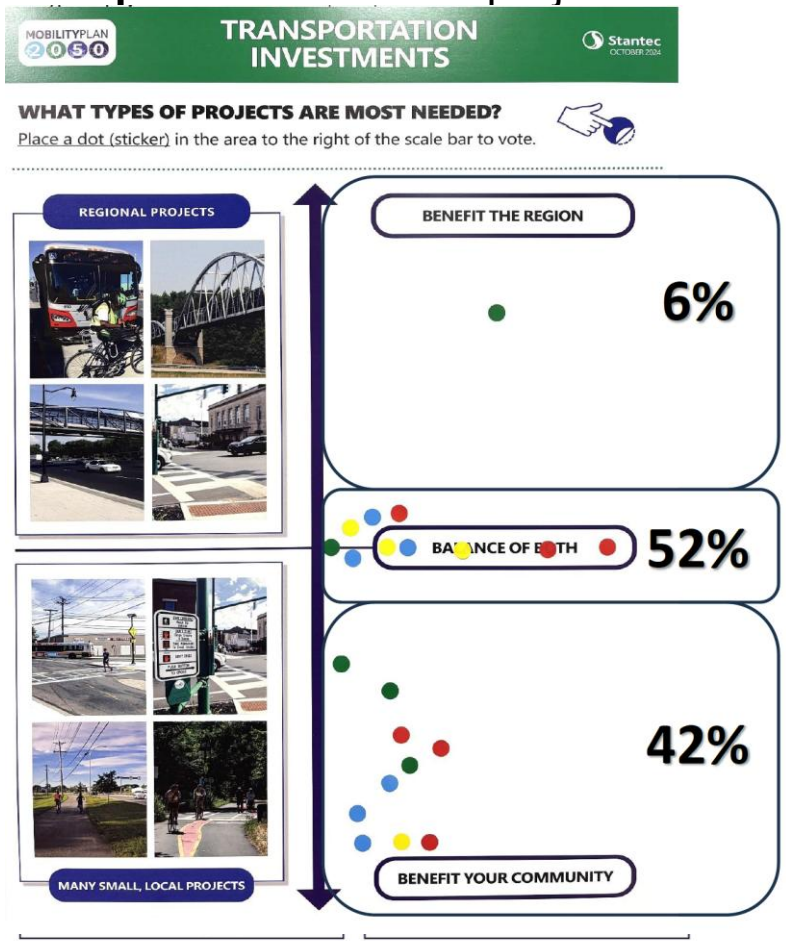
MOBILITYPLAN 2050

YOU told us …

- Ranking of goals (1-8)
- Most pressing mobility problems
- **Project types** to fund
- Open-ended comments

We **used** this to …

Emphasize local-scale projects in the near-term



MOBILITYPLAN 2050

Identification of Projects

The transportation projects selected in this Plan are based on multiple sources of input:

Data analysis

Assessing regional system performance

List of Projects

Previous projects audit by Technical Advisory Committee

Feedback

Public engagement

Coordination with cities, towns, and counties

Feedback

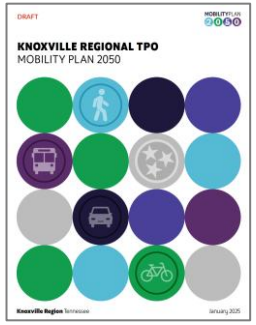
Travel Demand Model

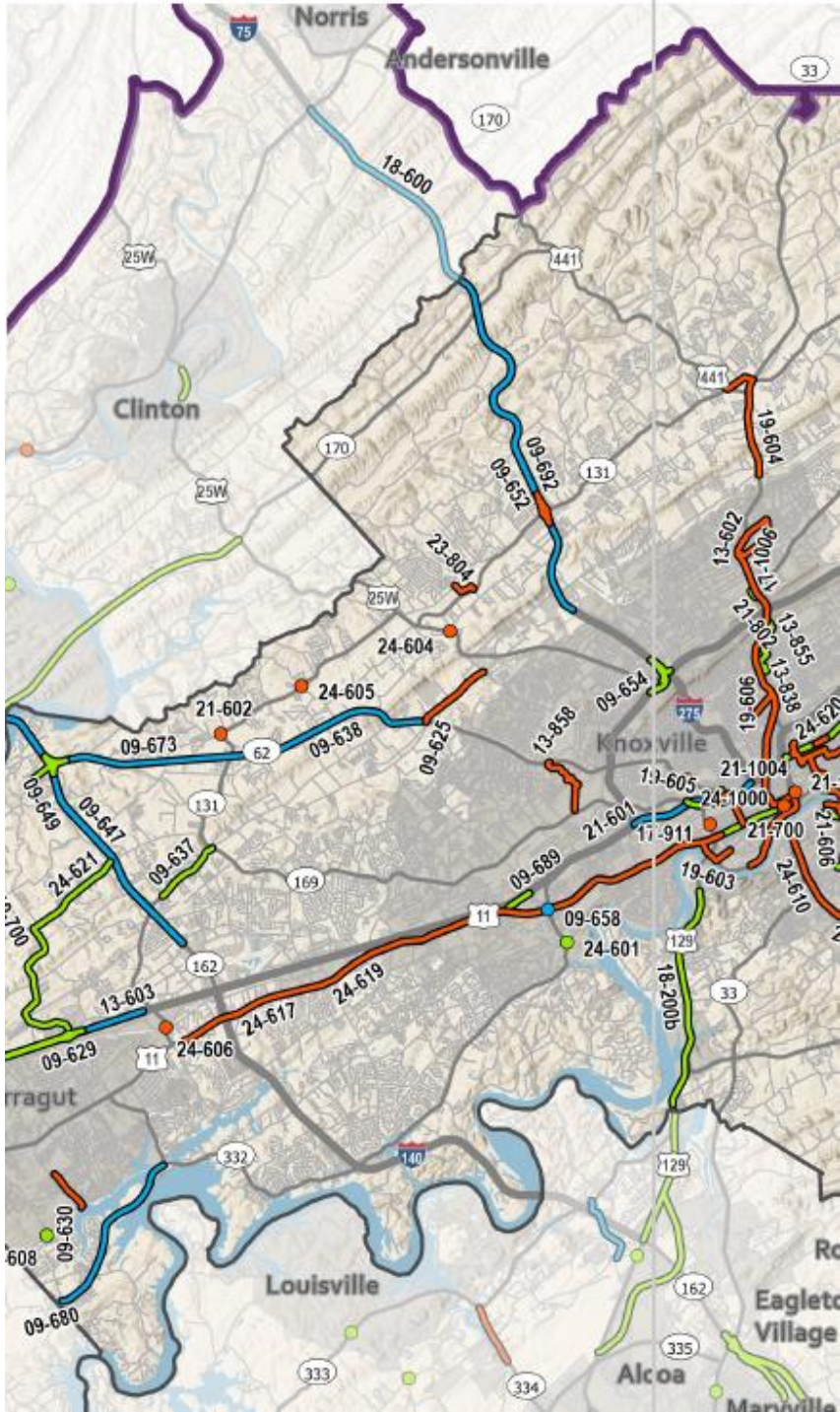
Data analysis

MOBILITYPLAN 2050

Projects – final list

- **113** rollover projects from 2045 Mobility Plan
- **+50** new projects added
- Projects by Category
  - Roadway – reconstruction, widening, maintenance
  - Bike/Ped – greenway/trail, ped bridge, Complete Street
  - ITS / Transit – ATMS, signal prioritization, new buses
  - Study / Other – Smart Trips, safety program, study
- Where can we read the **Mobility 2050 Plan?!**

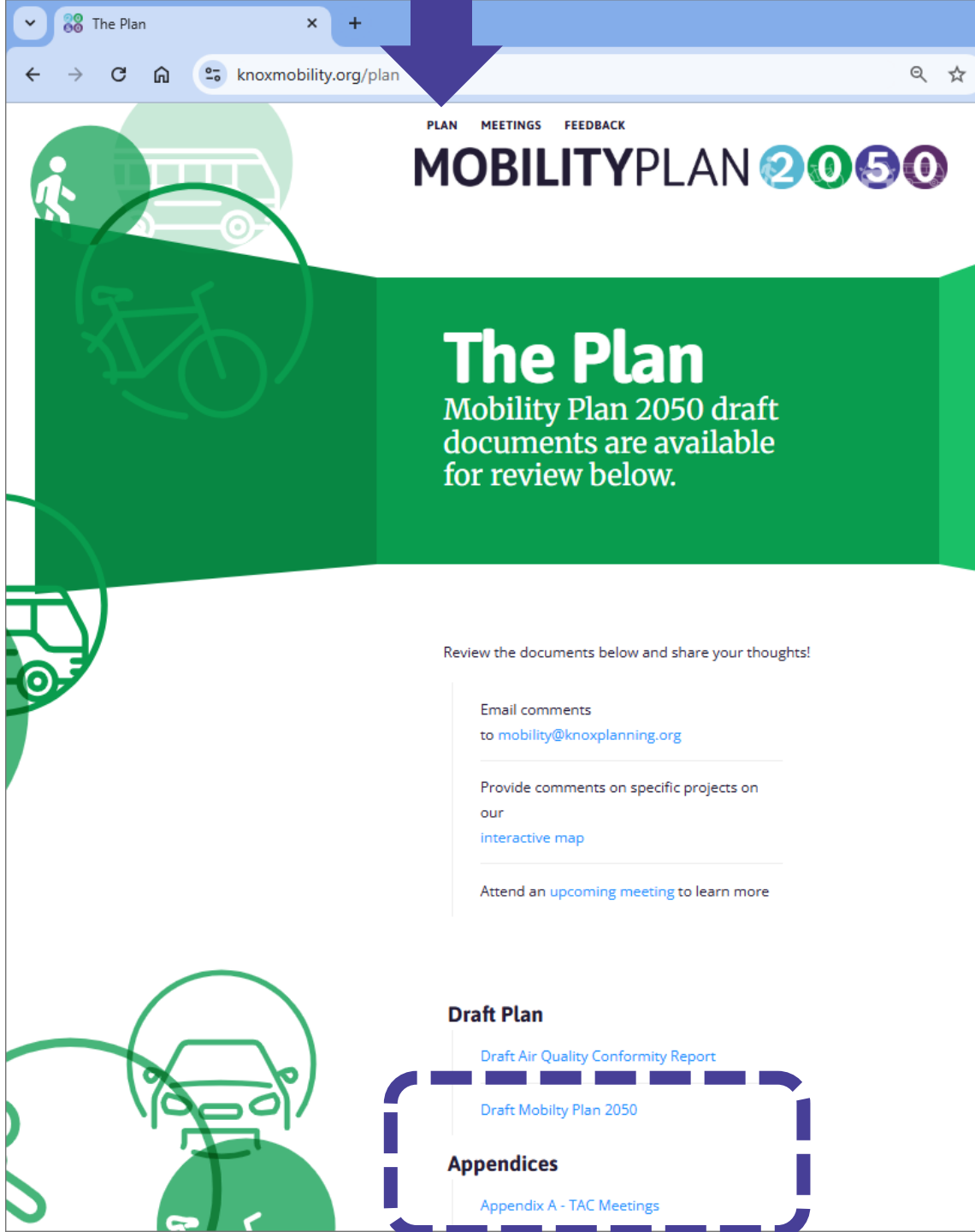




Website

- www.KnoxMobility.org
- Click on '**PLAN**' at the top

- How is the plan **organized**?!



Chapter 1 – Knoxville TPO

An introduction to Knoxville TPO

The Knoxville Regional Transportation Planning Organization (TPO) is the federally designated Metropolitan Planning Organization (MPO) for the Knoxville urbanized area. The TPO coordinates transportation planning and improvements across a **six-county area**, shown in Figure 1.1. The TPO boundary was revised following the 2020 Census to adjust for population growth in the region. For more specific information, visit https://knoxtpo.org/about-tpo/tpo-overview/.

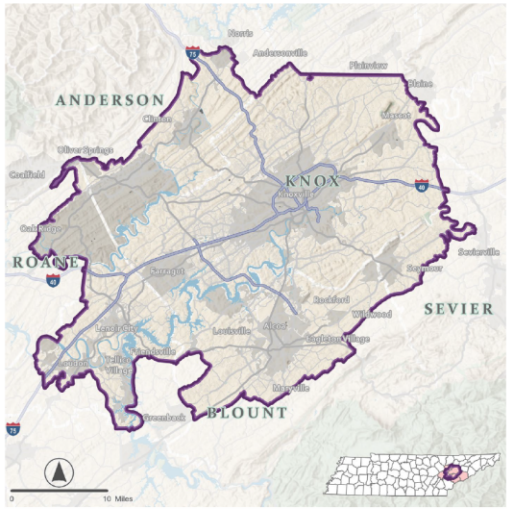


Figure 1.1: TPO Planning area

TPO Governance Structure

EXECUTIVE BOARD

- 17 Voting Members
- 2 Non-Voting Members

Responsible for setting policy and adopting plans and programs.

TECHNICAL COMMITTEE

- 22 Voting Members
- 2 Non-Voting Members

Provide recommendations to the Executive Board for plan and program development.

Our Planning Process

Our transportation planning process follows Federal guidance and must be comprehensive, cooperative, and continuing and is summed up in the three major plans and programs:

- The Metropolitan Transportation Plan (MTP);
- The Transportation Improvement Program (TIP); and
- The Transportation Planning Work Program (TPWP).

In addition, a draft copy of the plan was sent to federal and state agencies for review and comment in Spring 2025, during the public comment period.

Improvements to our transportation system are based on Federal guidance for a 3C planning process that is:

1. **COMPREHENSIVE** 2. **COOPERATIVE** 3. **CONTINUING**

Learn more about the 3C planning process:
https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/metropolitan-statewide-non-metropolitan-planning

The Mobility Plan, updated every four years, is a key tool for advancing our regional mobility network, coordinating plans with project development and funding opportunities. This update covers a 25-year period, and represents the region's collective long-term goals to fund, operate, maintain, and expand its transportation systems. The TIP represents the highest priority, short-range projects that have identified funding for design and construction. The TPWP identifies the TPO's specific work projects for this year and next, and their costs.

What is the Mobility Plan 2050?

Long-Range 20+ years

Regulated

Measured

Constrained

What is a Transportation Improvement Plan?

Short-Range 1-4 years

Prioritized & Constrained

What is the Transportation Planning Work Program?

Short-Range 1-2 years

Coordinated

Learn more about the MTP, TIP, and TPWP: https://knoxtpo.org/what-we-do/

CH1 covers…

- Who is the Knoxville TPO
- What are the Goals and Performance Measures
- Public Engagement process

Chapter 2 – How are we doing?

02

How are we doing?

The Knoxville TPO is responsible for planning the multimodal transportation network in the Knoxville region. Understanding our community, our transportation systems, and how our systems meet or fail to meet community needs, as well as future trends, is critical to a comprehensive process and an effective mobility network.

Demographics

16%
More People

2022 Population: 925,000 → **2050 Population 1.1 Million**

Tennessee, including the Knoxville Region, seeing much higher In-Migration than previous years.

More than half of region's growth will occur in Knox County.

32%
More Employment

More than 250,000 new employment opportunities by 2050.

Highest growth rate in the Service Industry.

Median Age

40	39	38.9
Knoxville MSA 2022	Tennessee 2022	United States 2022

Highest-Growth
Counties

Sevier	Loudon	Blount
+36%	+32%	+25%

Increased growth in rural areas is evident through twice as many building permits issued outside of the City of Knoxville than inside.

20-24 Age Group
2040 boom in younger residents (Knoxville MSA)

Children of Millennials reaching adulthood will increase.

By 2040, population in all age groups much larger, with more people living longer.

$323,000
Median Single-Family Home Sale Price
Knoxville MSA (2023)

Knox County alone is averaging more than 1,100 residential lots per year over the last decade.

Data Sources: Knoxville-Knox County Development Activity Report (2023); Knoxville Area Facts & Figures (2024); Woods & Poole Economics, Inc

02

Priority Population Analysis

Knoxville and Knox County identify transportation-disadvantaged and socially vulnerable populations using a priority populations analysis, which considers 27 socioeconomic indicators in total, notably: income, poverty, education, disability, limited English proficiency, age, minority status, along with social determinants of health and accessibility. The priority population analysis for Knoxville-Knox County has been on-going since 2013, highlighting its importance to the region.

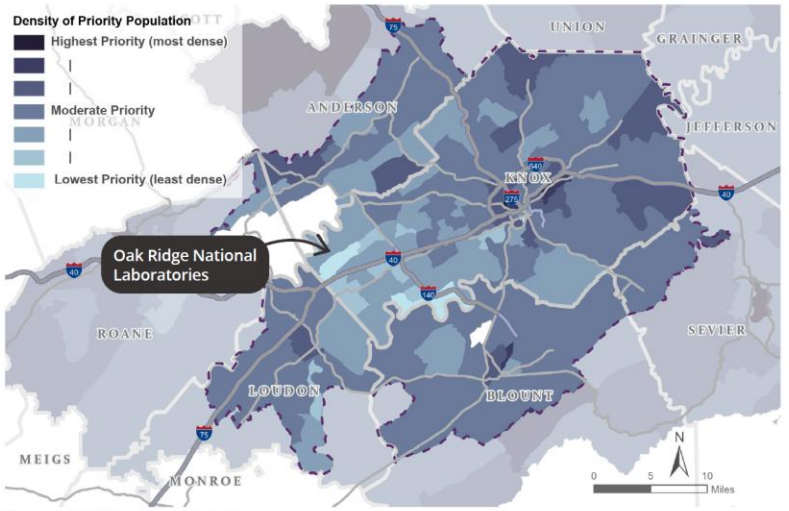


Figure 2.1: Priority Population Analysis Map
Data Source: Knoxville-Knox County Planning - Priority Populations - https://knoxplanning.org/data

CH2 covers…

- Demographics
- Natural Resources / Land Use
- Employment / Commuting
- Transportation by mode
  - Roadways & Freight
  - Bicycle & Pedestrian
  - Public Transit
  - Rail / Aviation / ITS

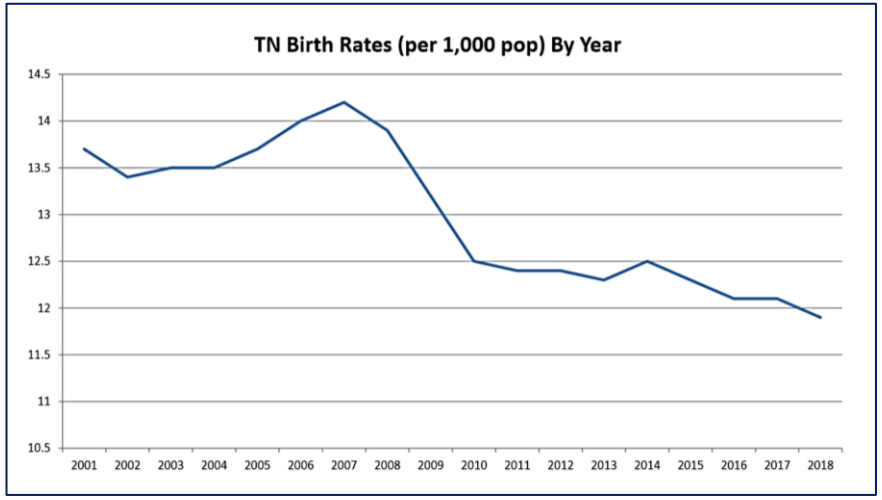
Major Trends Influencing Population Change

- Population Change Comprised of:

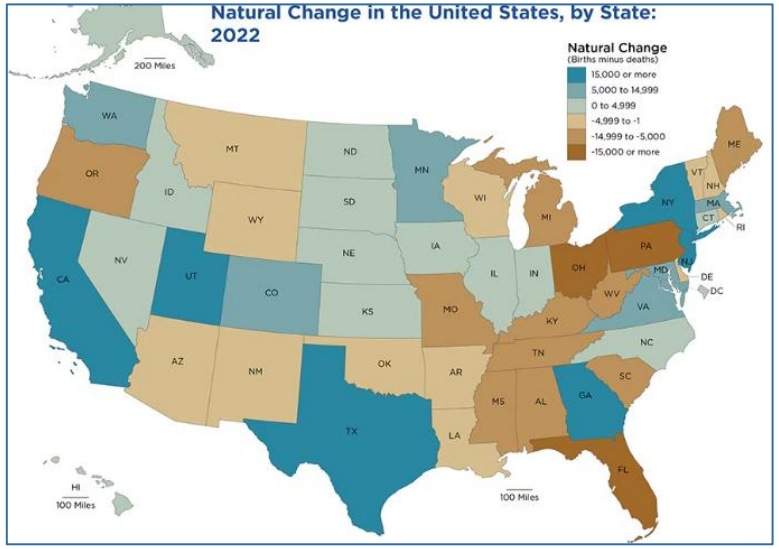
  Natural Change (Births – Deaths) + Net Migration

- During the Great Recession (2007-2009), birth rates across the nation dropped
  - For years, assumed birth rates would return to pre-recession levels but this appears to be a foundational change
- Many States including Tennessee experiencing negative Natural Change from 2020-2022
- Tennessee, including Knoxville Region, seeing much higher In-Migration than previous years

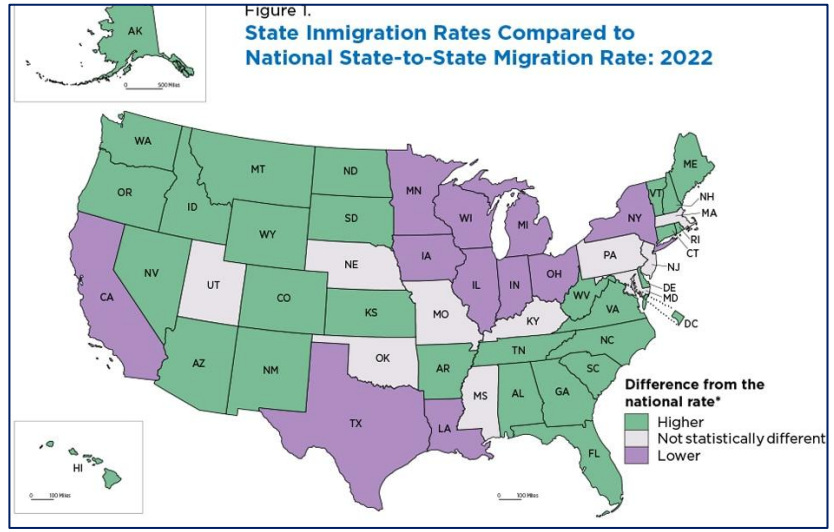
Birth Rate Decline



Recent Negative Natural Change

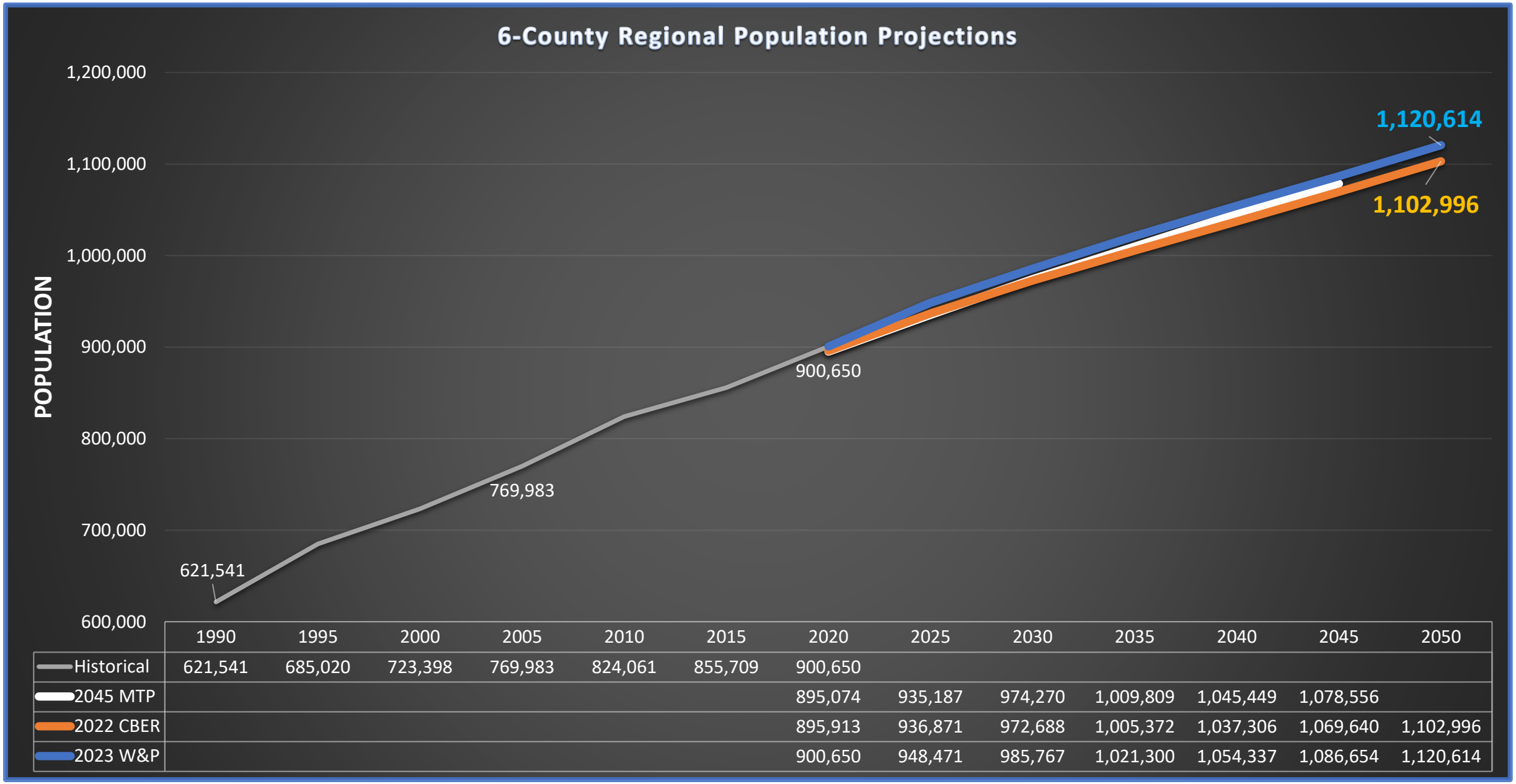


Recent Positive Net Migration



MOBILITYPLAN 2050

6-County Regional Population Projections



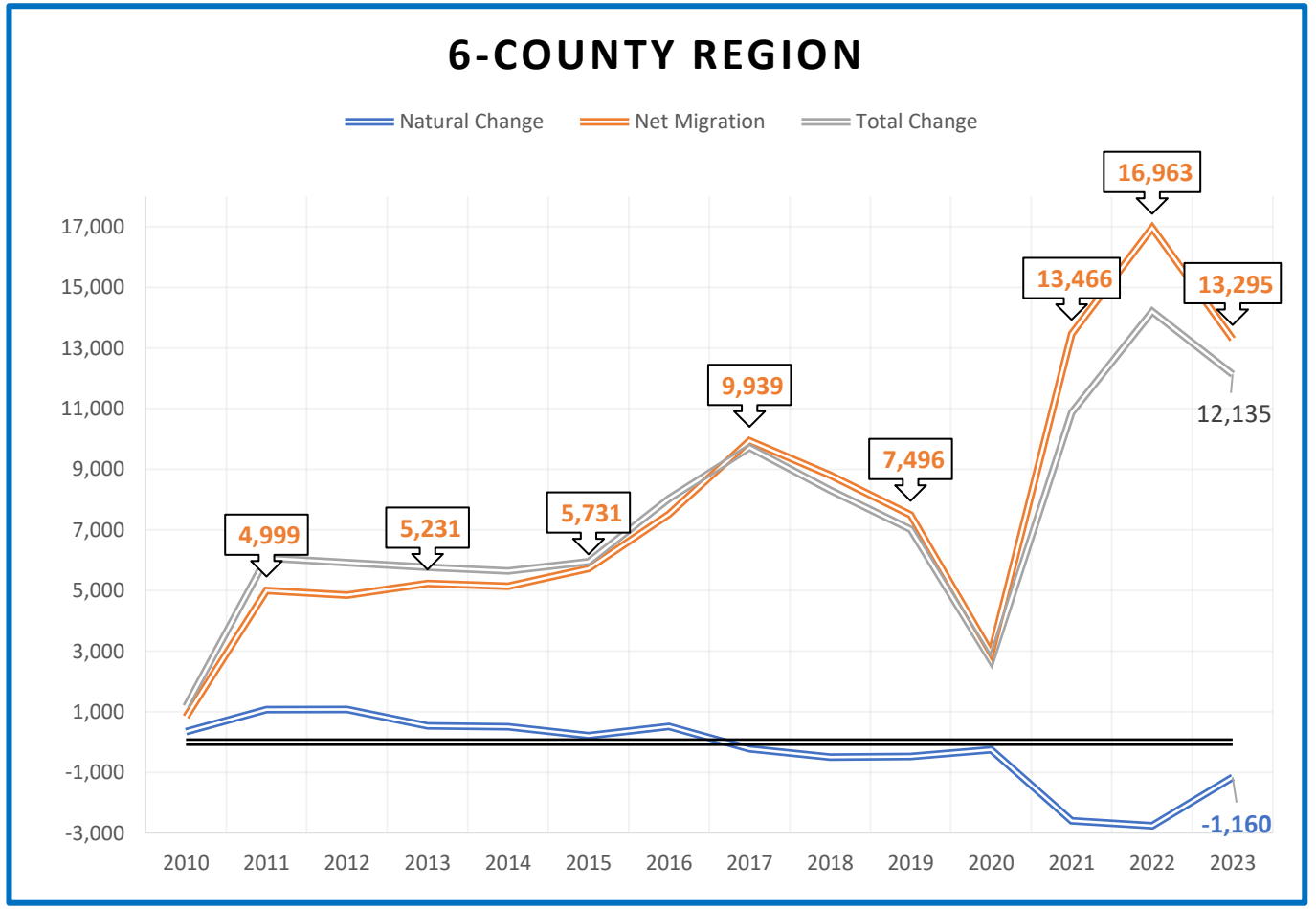
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Historical	621,541	685,020	723,398	769,983	824,061	855,709	900,650						
2045 MTP							895,074	935,187	974,270	1,009,809	1,045,449	1,078,556	
2022 CBER							895,913	936,871	972,688	1,005,372	1,037,306	1,069,640	1,102,996
2023 W&P							900,650	948,471	985,767	1,021,300	1,054,337	1,086,654	1,120,614

MOBILITYPLAN 2050

6-County Region – Summary and Top 10 States Contributing most to our In-Migration

1	Tennessee	28,349
2	Florida	3,756
3	Georgia	2,166
4	California	1,917
5	North Carolina	1,719
6	Virginia	1,673
7	Texas	1,653
8	Illinois	1,421
9	New York	1,082
10	Alabama	1,006

Source: Census State-to-County Migration Flows ACS 2017-2021



MOBILITYPLAN 2050

Chapter 3 – Where are we heading?

Where are we heading?

03

Identification of Projects

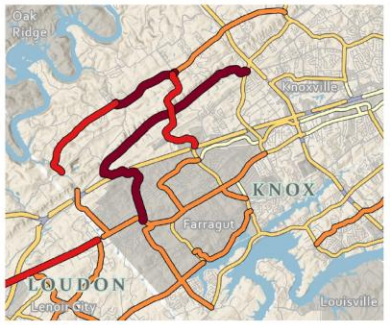
The transportation projects selected in this Plan are based on multiple sources of input:

- **Assessing regional system performance**
- **Coordination with cities, towns, and counties**
- **Previous projects audit by Technical Advisory Committee**
- **Travel Demand Model**
- **Public engagement**

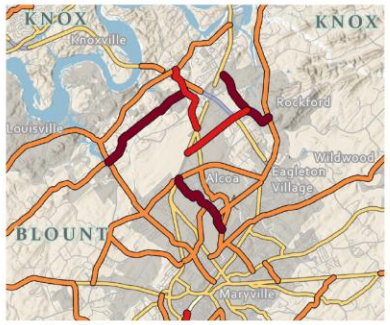
Why is the Travel Demand Model Important?

Projecting future traffic is not an exact science, but merely a transportation planning strategy that relies on forecasting (1) **population growth**, (2) **development patterns**, and (3) **driving behavior** (or mode choice). A travel demand model is a tool that translates this growth onto our future roadway network to help identify potential traffic issues before they may occur. Ideally we are able to improve traffic capacity before congestion becomes too severe, while also allowing for alternative modes of travel to become a more feasible option for travelers.

A travel demand model is also valuable to help us **prioritize** funding towards roadway projects that may address the more heavily congested areas within the region. For more information, see details contained within the Appendices.



Farragut Area Inset



Alcoa-Maryville Area Inset

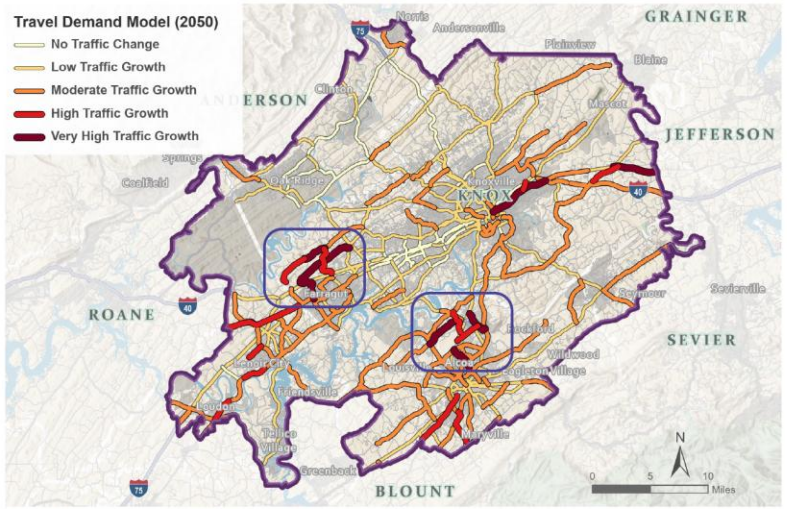


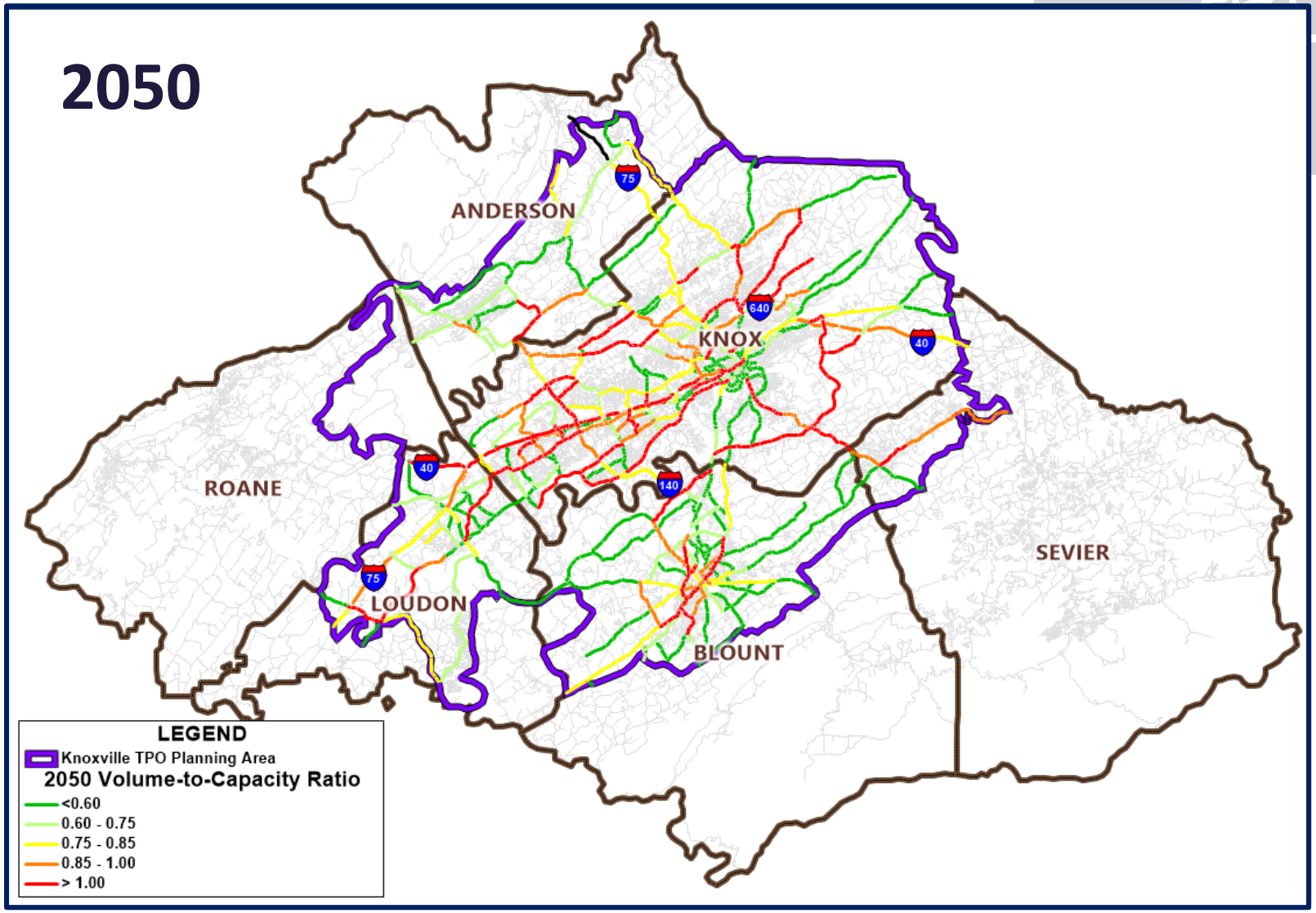
Figure 3.3: Forecasted Regional Traffic Growth for 2050
Data Source: Travel Demand Model Output

CH3 covers…

- Project identification
- Prioritization
- Travel Demand Model
- Funding Plan
  - 2030 Horizon
  - 2040 Horizon
  - 2050 Horizon
- Projects by County
- Potential Impacts on natural and cultural environment
- Air Quality Conformity

Model Outputs for Congestion Management Process

- Volume-to-Capacity (V/C) Analysis
- Simple “planning-level” analysis of a roadway’s general capacity
- First plug in “Committed” projects, e.g. Alcoa Hwy
- Highest V/C Roadways in Year 2050:
  - Schaad Rd
  - Oak Ridge Hwy
  - Broadway Ave (Maryville)
  - Tazewell Pk
  - I-40/75



Sample Projects: Major Capacity

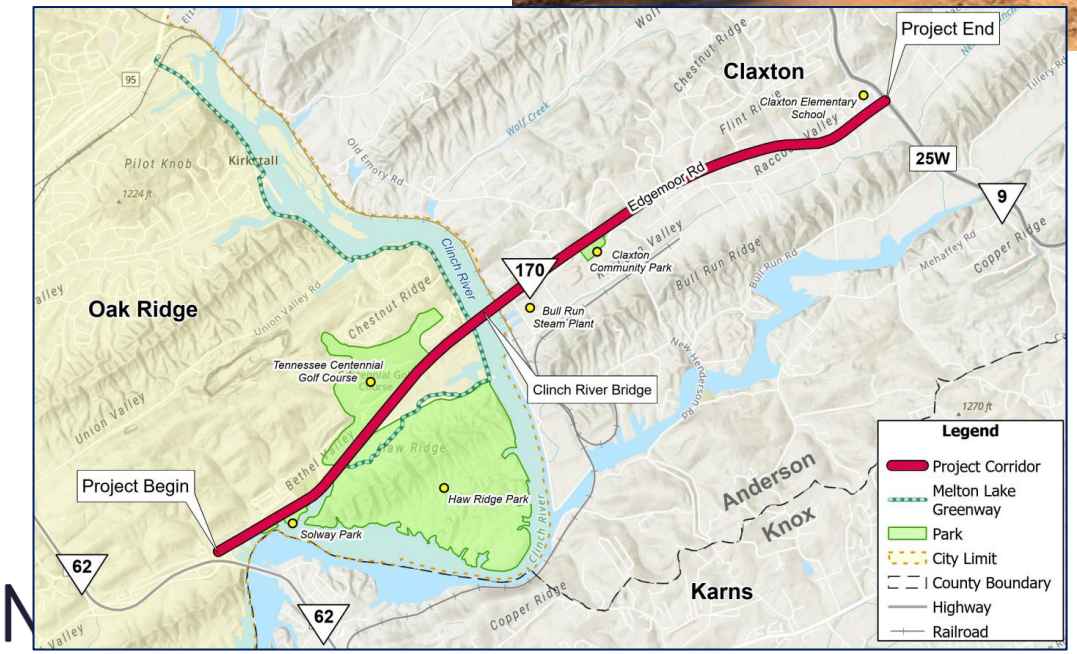
Regional Goal:
Congestion Reduction, Economy and Freight

- Alcoa Highway (SR 115/US-129) Improvements
  - Widening on existing alignment between Pellissippi Pkwy & Topside Rd
  - Complete Stage 2 of Relocated Alcoa Hwy (Airport Motor Mile Bypass)

Total Investment: $280M

- Edgemoor Road (SR 170) Improvements
  - Widening from 2 to 4/5 Lanes with sidewalk and greenway path
  - 6-mile Project from SR-62 to Clinton Hwy split into two segments at Melton Lake Drive

Total Investment: $350M



Sample Projects: Intelligent Transportation Systems (ITS)

Regional Goal:
Congestion Reduction

- Chapman Highway Advanced Traffic Management System (ATMS)
- Oak Ridge Signal Timing Optimization Ph. 3
- Knoxville ATMS - Ph. 1 (Broadway)
- Knoxville ATMS - Ph. 2 (Kingston Pk)
- Alcoa Highway ITS
- U.T. Area Traffic Signal Improvements

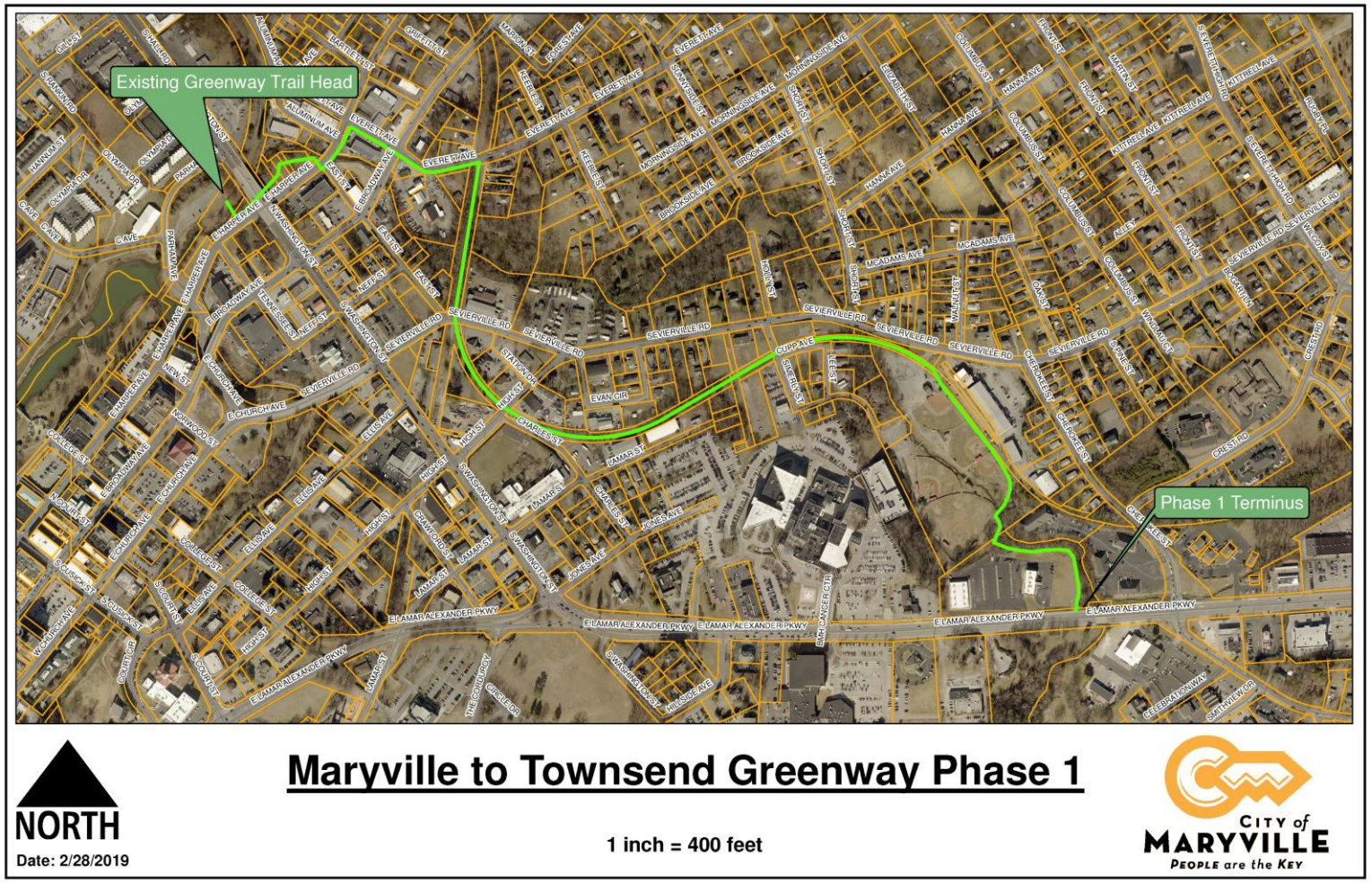
Total Investment: $53M

Sample Projects: Bike & Pedestrian

Regional Goal:
More Options, Equitable Access, Health and Environment

- Maryville to Townsend Greenway- Ph. 1
- Oak Ridge Rails to Trails
- Knoxville First Creek Greenway - Downtown East
- Blount County Greenway Trail - Ph. 1
- South Knoxville Bridge Greenway (James White Parkway)
- Gibbs Schools Pedestrian Bridge

Total Investment: $85M



MOBILITYPLAN 2050

Appendix – Technical Context

Appendix

Additional technical analysis has been assembled, summarized, shared with advisory committee members to guide this plan update. These additional resources are available electronically. Appendix items include:

A. Technical Advisory Committee (TAC) meetings
B. Public Engagement Resources
C. System Performance Resources
D. Congestion Management Process (CMP)
E. ITS / System Architecture
F. Multimodal Assessment
G. Transit System Summary
H. Recommended Projects Table
I. Recommended Projects Table
J. Air Quality Conformity
K. Travel Demand Model Summary

392 additional pages

- Documentation

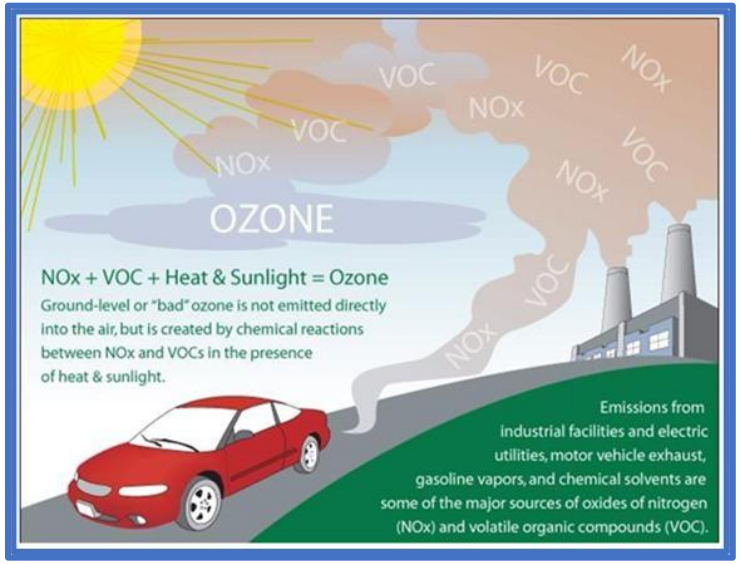
Project Table(s)

MOBILITYPLAN 2050

Air Quality Conformity - Background

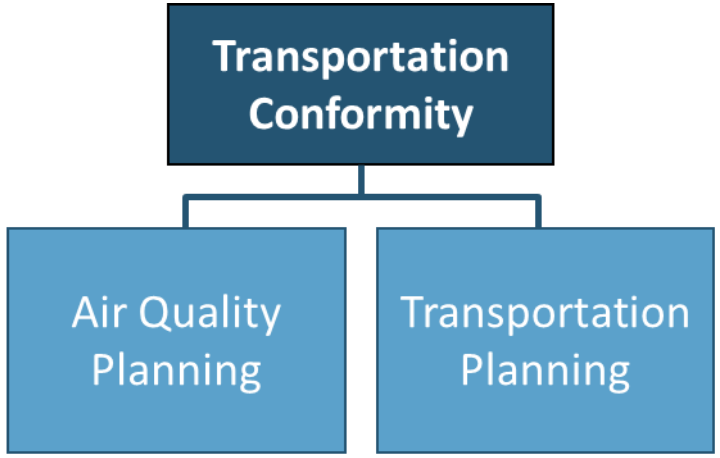
- 1970 – Clean Air Act and EPA Established

- Clean Air Act Regulates 6 “Criteria” Pollutants:
  - **Ground Level Ozone**
  - **Particulate Matter**
  - Carbon Monoxide
  - Nitrogen Oxides
  - Sulfur Dioxide
  - Lead



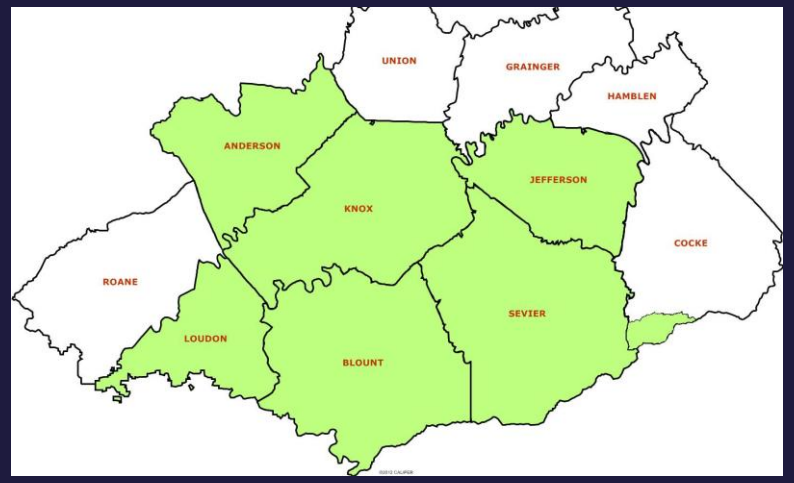
Air Quality Conformity - Process

- Ensures that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS)
- Conformity is demonstrated through a technical analysis using the Travel Demand Forecasting Model and EPA Emission Factor Model (MOVES)
  - Travel Demand Model provides estimates of Vehicle Miles of Travel (VMT)
  - MOVES provides emission rates based on local conditions and speed estimates from travel demand model.
- VMT (miles) * Emission Rate (grams/mile) = Total Emissions
- Total Emissions must be less than allowable "Motor Vehicle Emissions Budget"



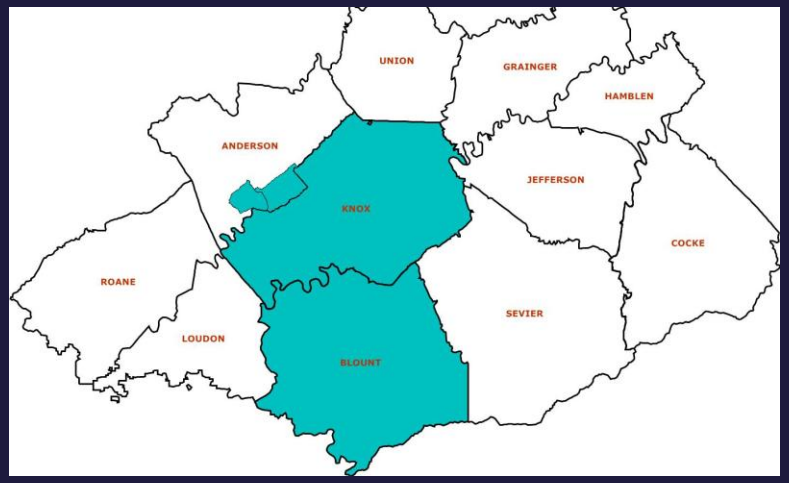
Areas Subject to Air Quality Conformity

1997 Ozone Standard



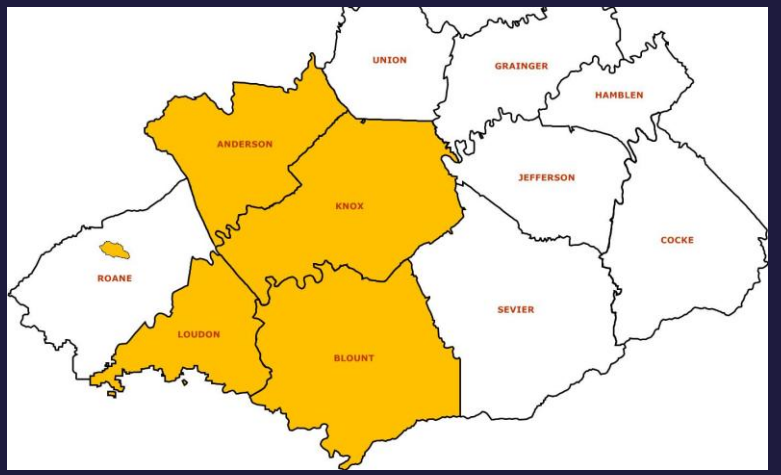
Maintenance Area
until 3/8/2031

2008 Ozone Standard



Maintenance Area
until 8/12/2035

2006 Daily PM2.5 Standard



Maintenance Area
until 9/27/2037

MOBILITYPLAN 2050

Air Quality Conformity - Results

- Emissions Test for Ozone Standard:

	Analysis Year			
Volatile Organic Compounds (VOC):	**2026**	**2035**	**2040**	**2050**
Motor Vehicle Emissions Budget (MVEB)	10.49	10.49	10.49	10.49
Projected Emissions	5.31 ✓	3.78 ✓	3.30 ✓	2.84 ✓
Oxides of Nitrogen (NOx):	**2026**	**2035**	**2040**	**2050**
Motor Vehicle Emissions Budget (MVEB)	17.69	17.69	17.69	17.69
Projected Emissions	9.85 ✓	3.89 ✓	3.05 ✓	2.80 ✓

Emissions in tons per day

- Emissions Test for Daily PM2.5 Standard:

	Analysis Year				
Direct Particulate Matter 2.5:	**2026**	**2028**	**2035**	**2040**	**2050**
Motor Vehicle Emissions Budget (MVEB)	1.22	0.67	0.67	0.67	0.67
Projected Emissions	0.42 ✓	0.39 ✓	0.30 ✓	0.28 ✓	0.29 ✓
Oxides of Nitrogen (NOx):	**2026**	**2028**	**2035**	**2040**	**2050**
Motor Vehicle Emissions Budget (MVEB)	42.73	19.65	19.65	19.65	19.65
Projected Emissions	12.35 ✓	10.70 ✓	4.92 ✓	3.99 ✓	3.67 ✓

Emissions in tons per day

Website

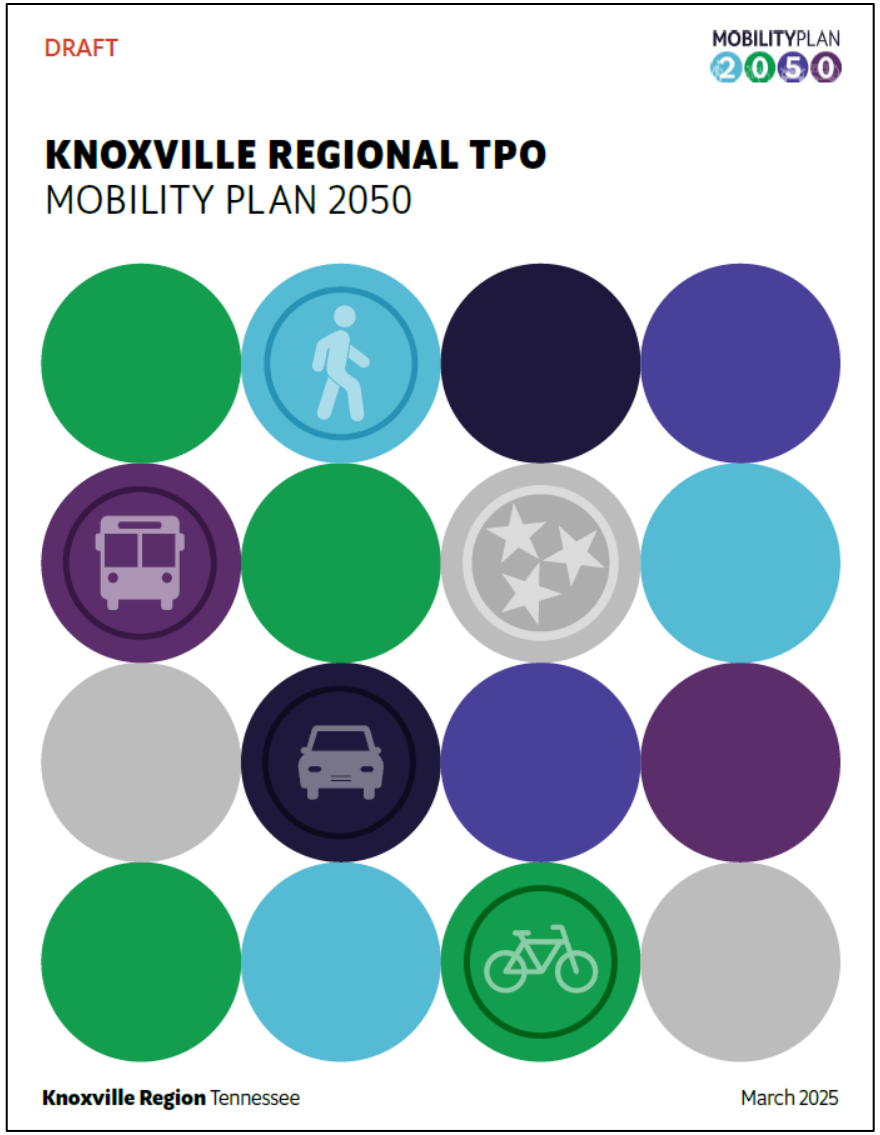
- www.KnoxMobility.org
- Click on '**PLAN**' at the top

- How can we submit **comments**?!
  - Demo ArcGIS WebApp

Remaining Items

Our final steps...

- FHWA + Public review (now)
  - Comments encouraged **through April 22nd**
  - Revisions / generate final MTP document
- Adoption Wednesday April 30



MOBILITYPLAN 2050