

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

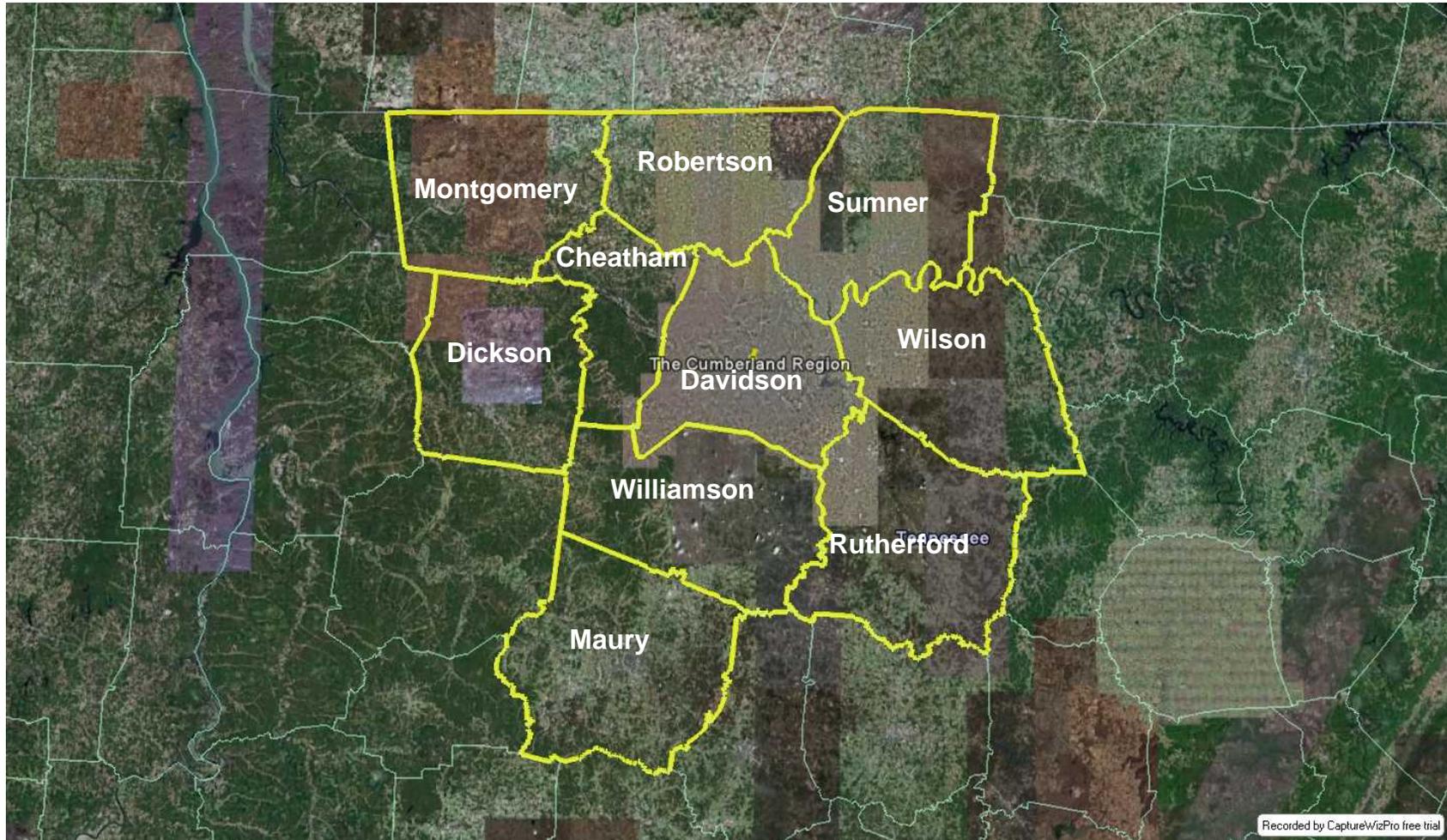
Mayor Ernest Burgess, Chair  
Mayor Karl Dean, Vice-Chair  
Michael Skipper, Executive Director



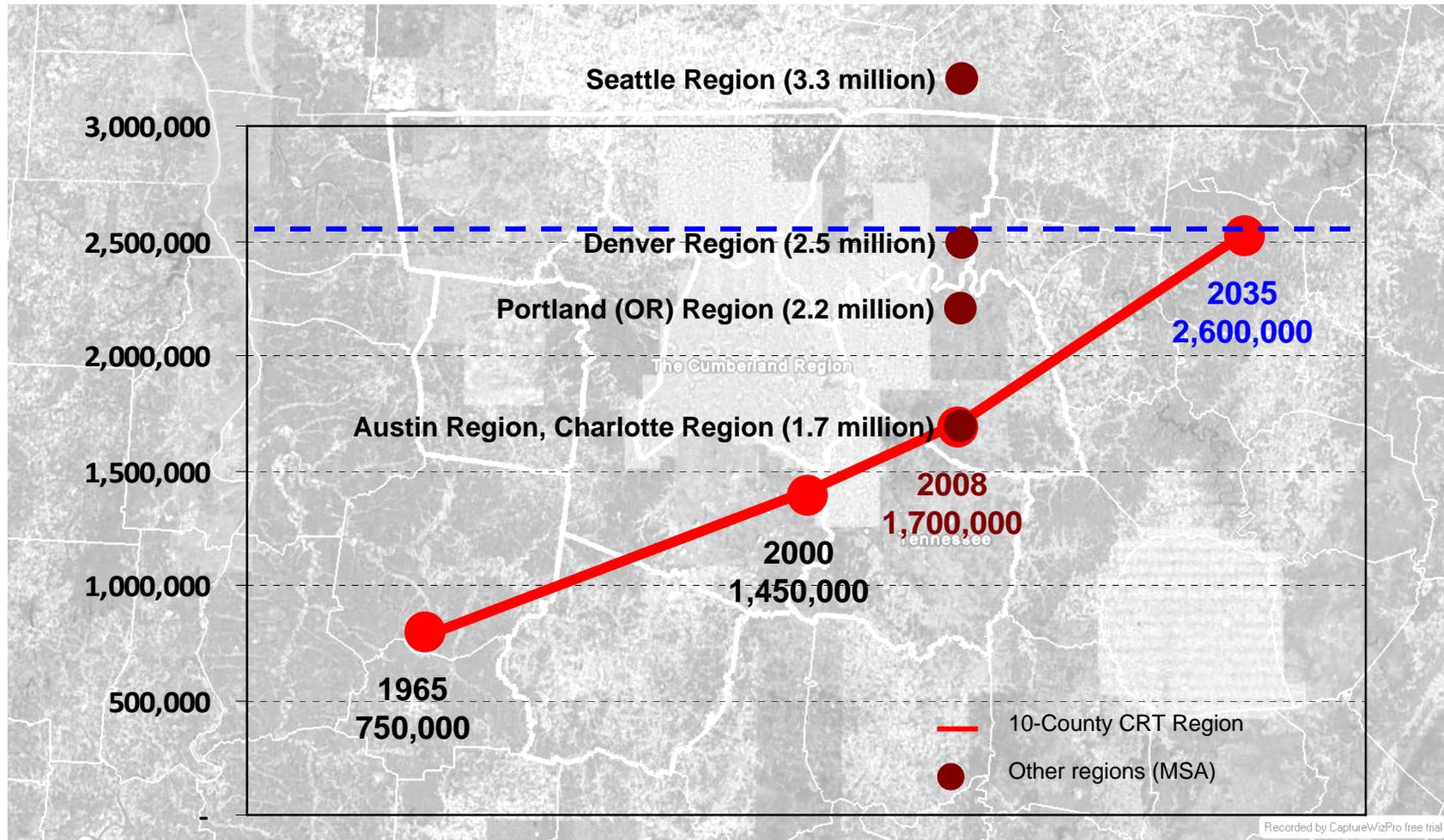
# Planning for the next 25 Years of Growth

**2035 Regional Transportation Plan:**  
**A Shared Responsibility to Develop a Plan that Supports Our Goals for**  
**Livability, Prosperity, Sustainability, Diversity**

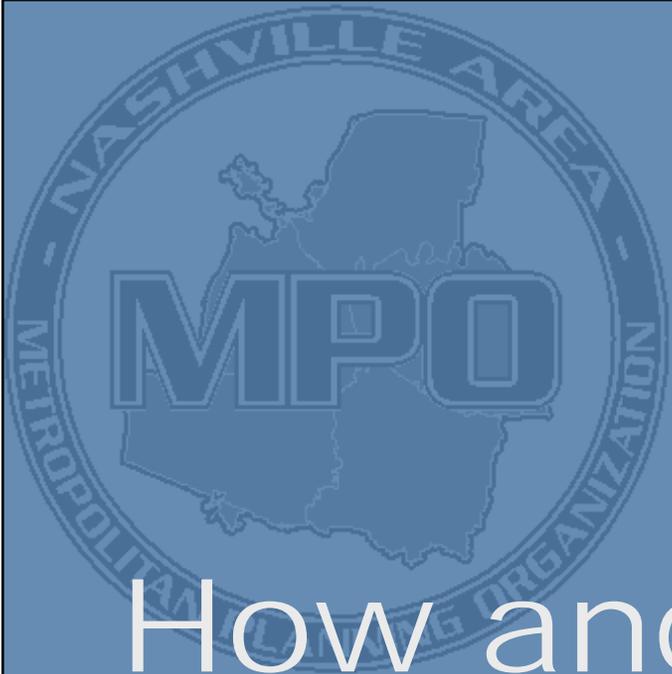
# Regional Geography



# Regional Population Growth



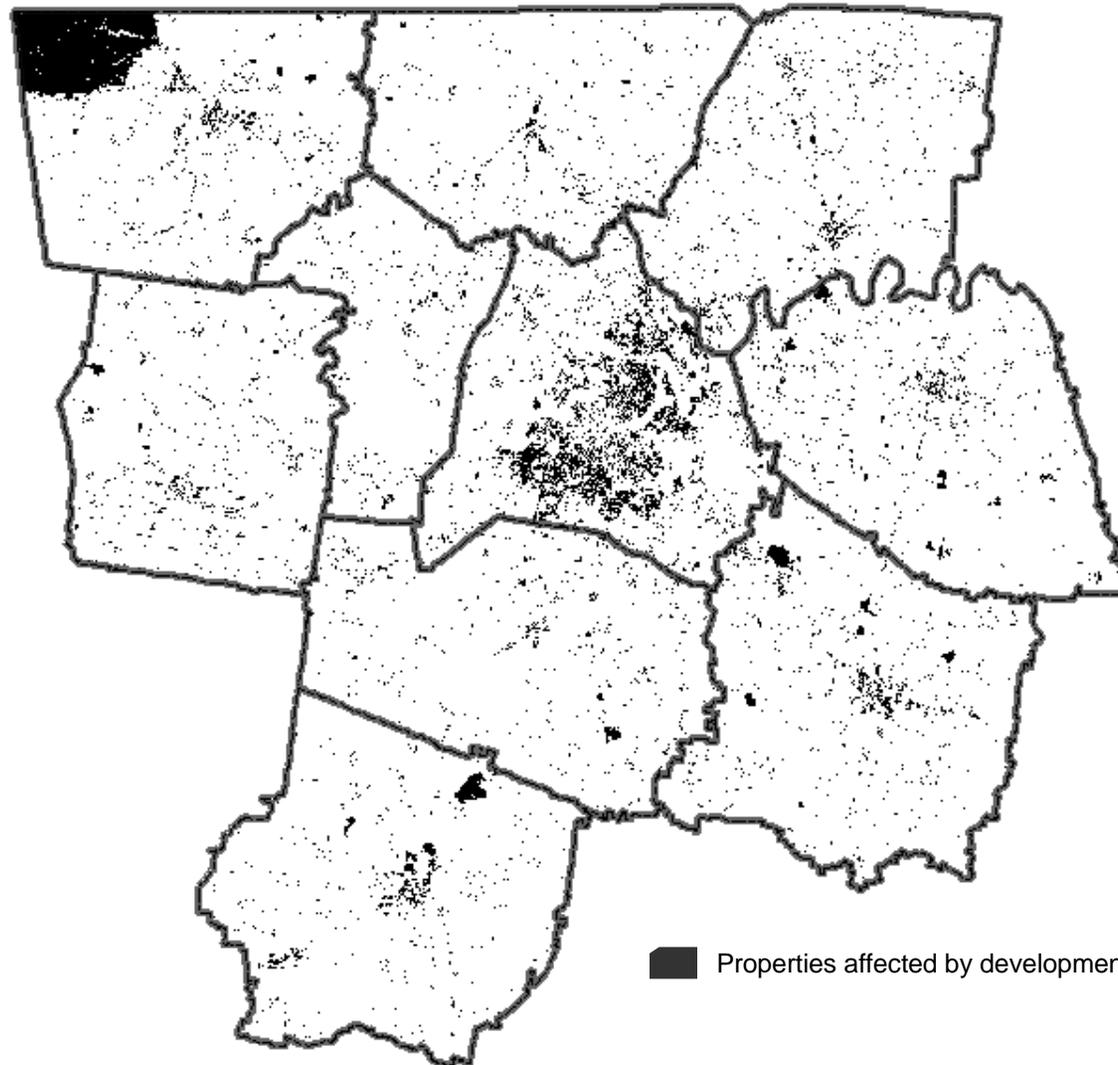
Source: U.S. Census Bureau, Woods & Poole Economics



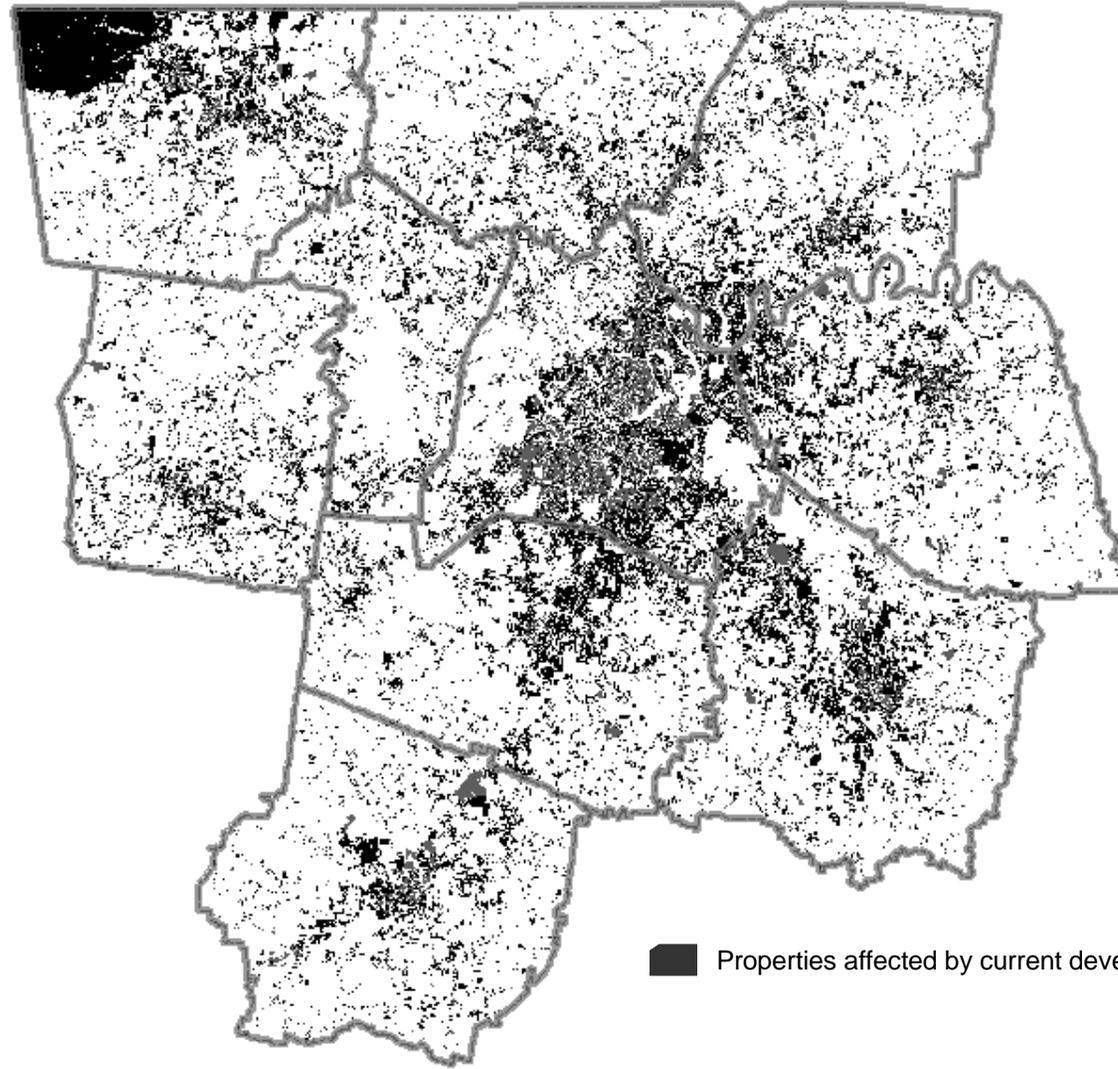
# How and Where Will We Live, Work, and Play?

Historical Trends, Policies & Regulations, Market Competition, Public Investment  
**ENERGY COSTS, HOUSING AFFORDABILITY, ENVIRONMENTAL IMPACT**

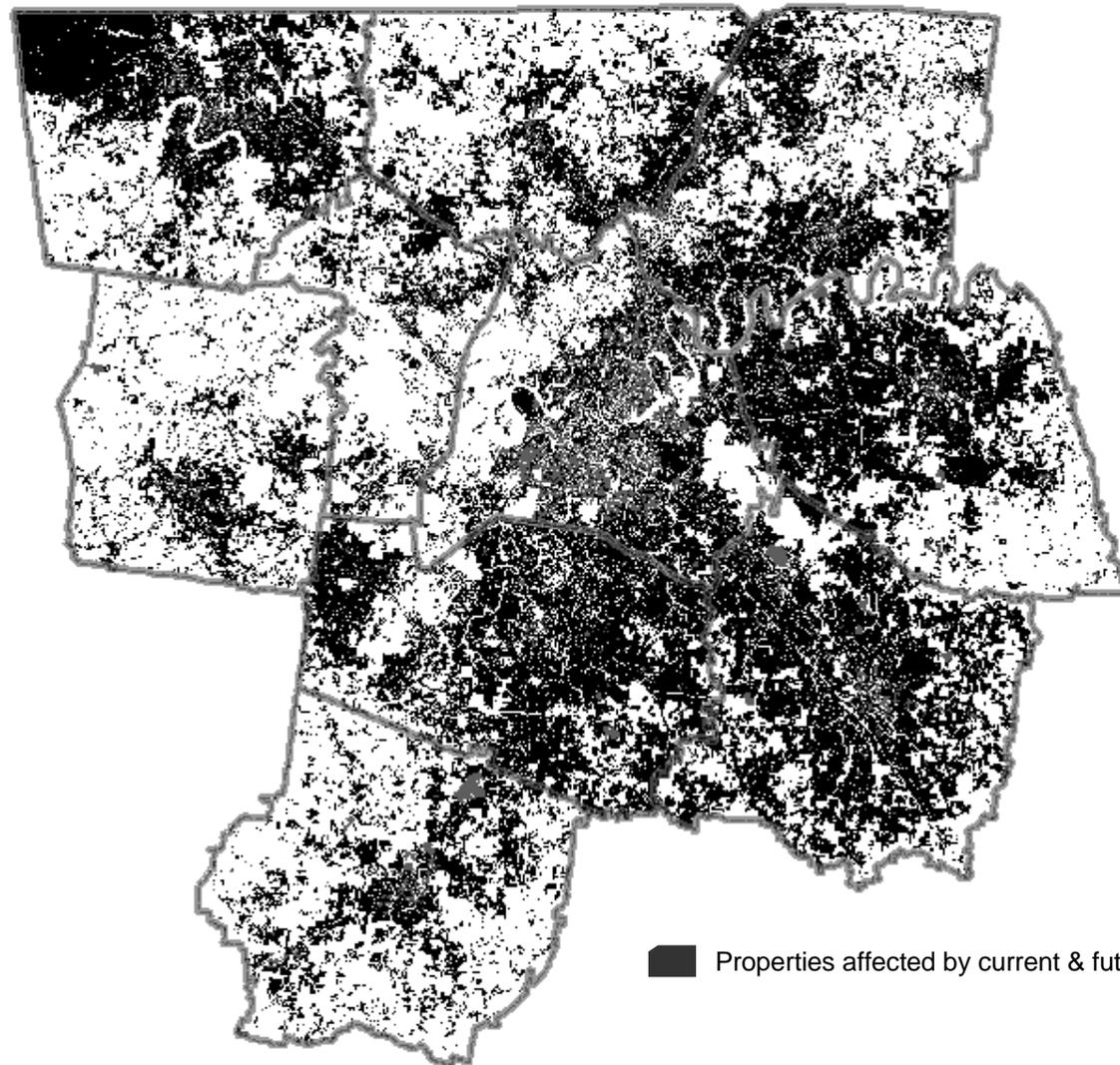
# 1965 DEVELOPMENT PATTERN



# 2008 DEVELOPMENT PATTERN



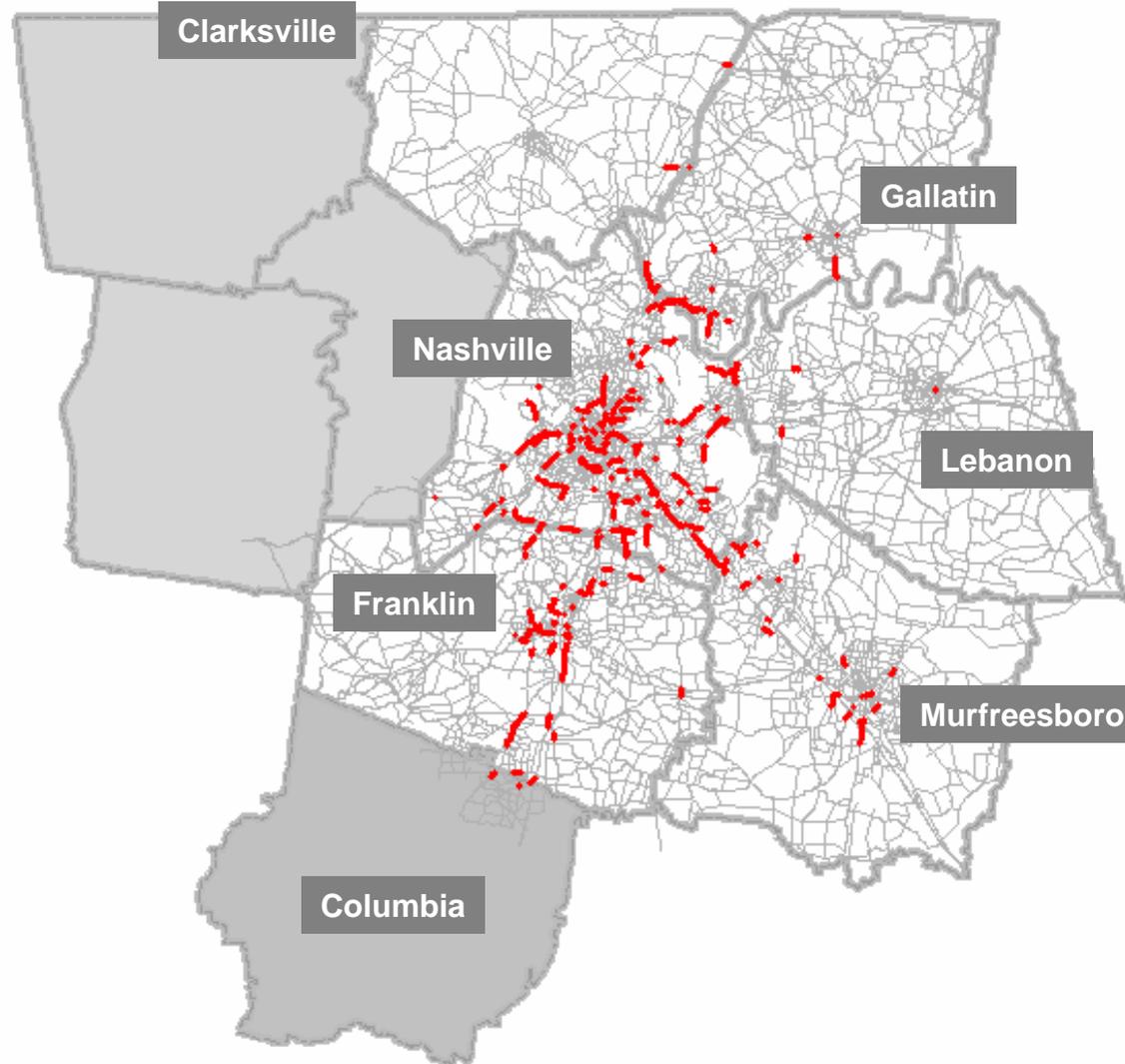
# 2035 DEVELOPMENT PATTERN?



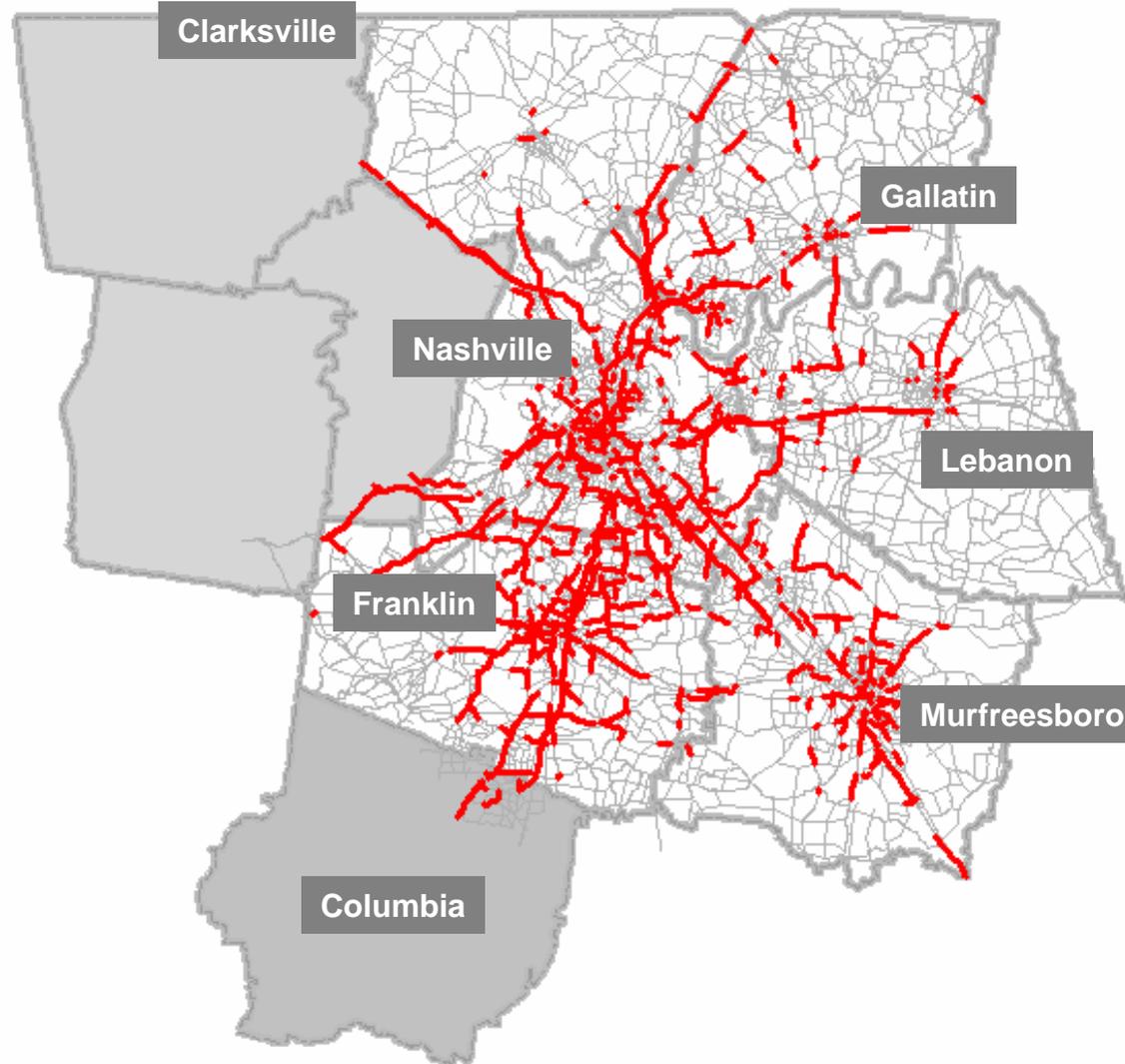
# Major Roadway Network



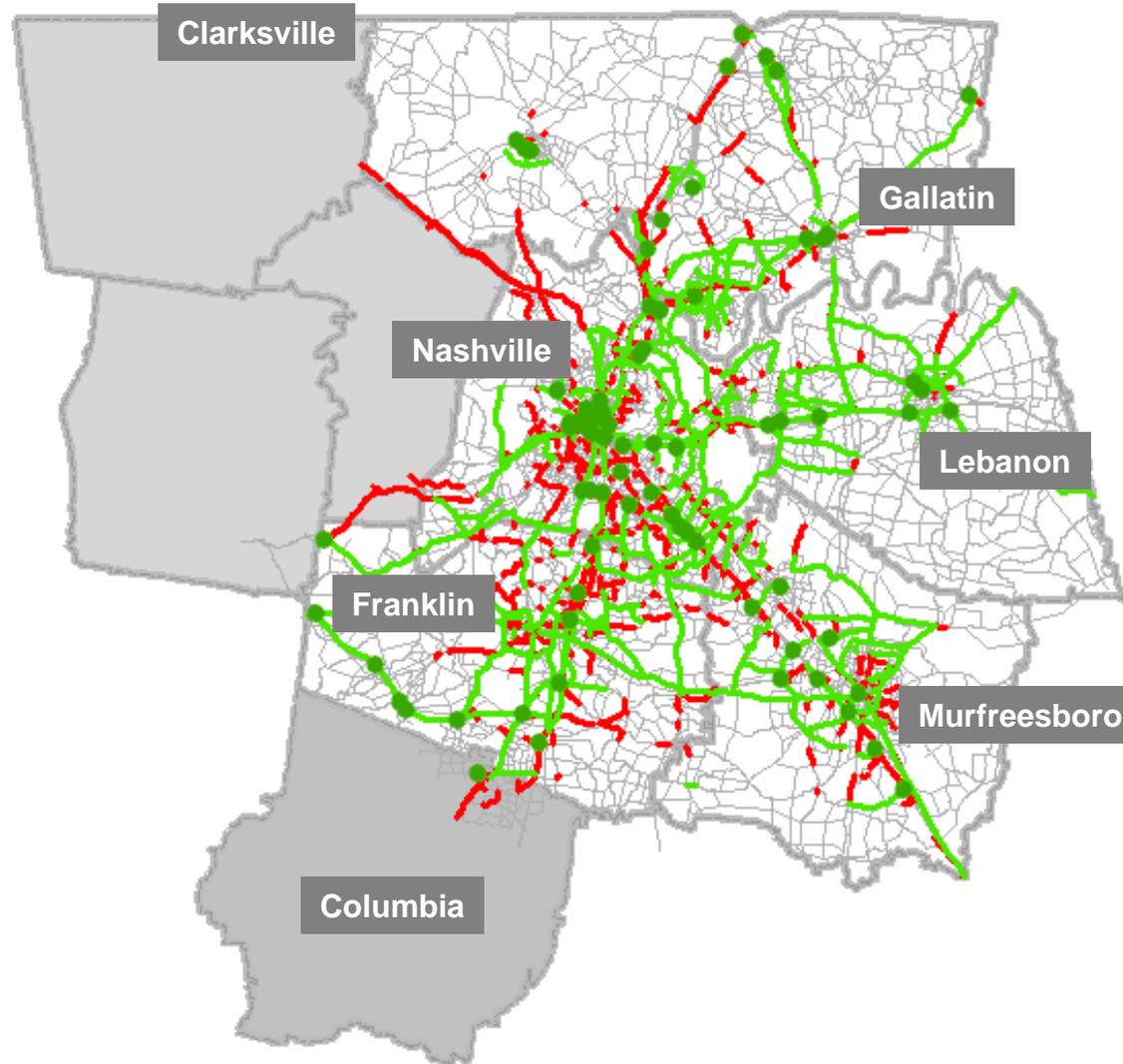
# 2008 Congestion



# 2035 Projected Congestion

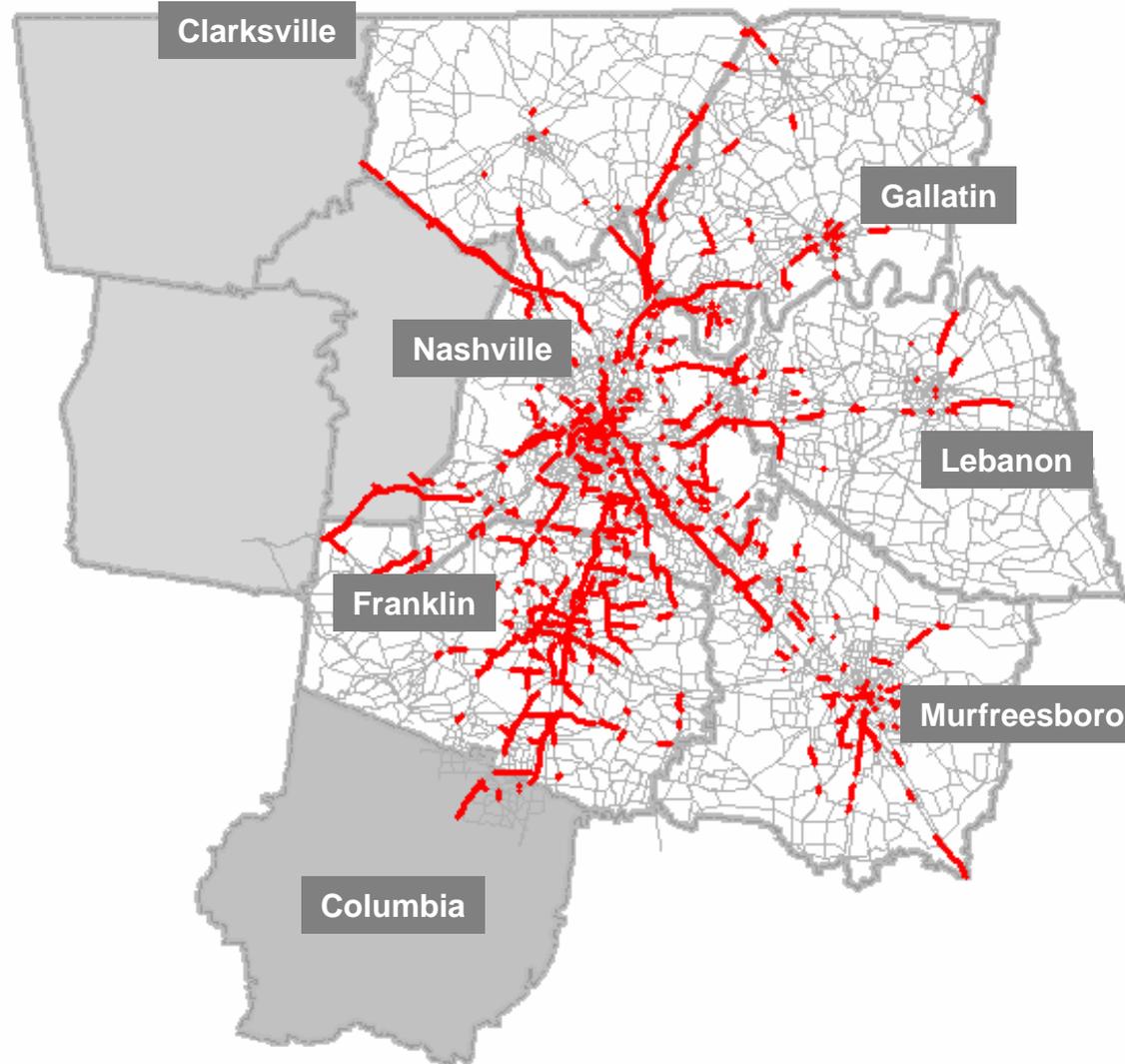


# Roadway Projects in Current Plan



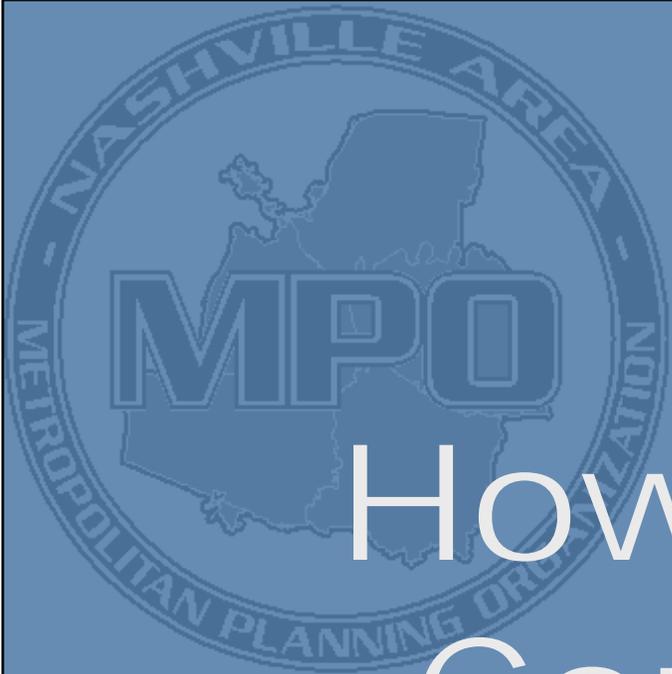
# 2035 Project Congestion

Westmoreland



# Convergence of Challenges

- ▶ **Unmanageable Congestion**
- ▶ Longer Travel Times & Trip Lengths
- ▶ **Increasing Energy Consumption / Costs**
- ▶ Declining Air & Water Quality
- ▶ **Aging Population/ Dispersed Families**
- ▶ Worsening Personal Health / Increasing Costs
- ▶ **Lost Habitat / Natural Areas**
- ▶ Unsustainable Costs/ Revenue Sources
- ▶ **Lack of Housing Choice**



# How Have our Competitors Responded?

Roads, Bridges, Transit, Walking, Biking, Management  
**A MULTI-MODAL APPROACH TO TRANSPORTATION**

# Public Transportation Options In U.S.

## Heavy Rail Transit



- existing
- proposed

Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.



Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.



## Light Rail Transit



# Public Transportation Options In U.S.



# Public Transportation Options In U.S.



**Dedicated Lane BRT**



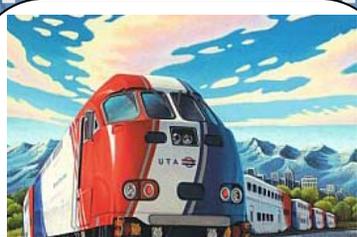
Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.

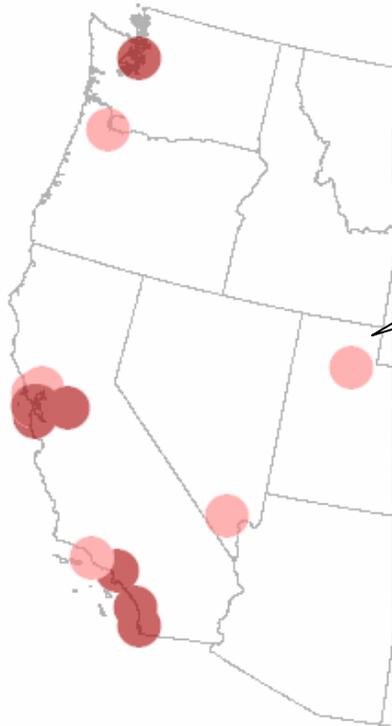


Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.



## Commuter Rail Transit



-  existing
-  proposed



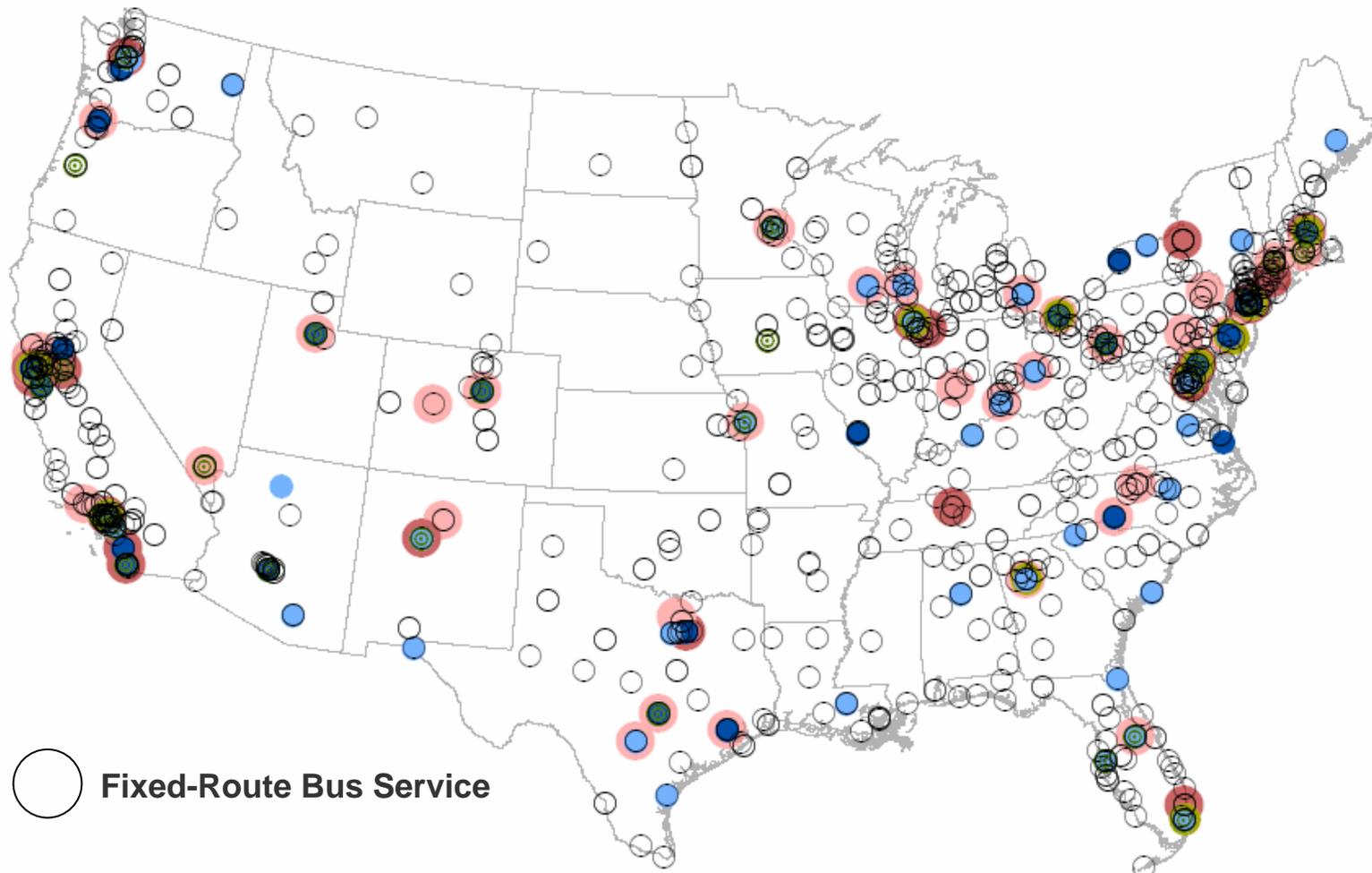
Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.



Source: American Public Transportation Association  
Mapping: Nashville Area MPO

# Public Transportation Options In U.S.



○ Fixed-Route Bus Service

Source: American Public Transportation Association  
Mapping: Nashville Area MPO

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# How Do We Get There?

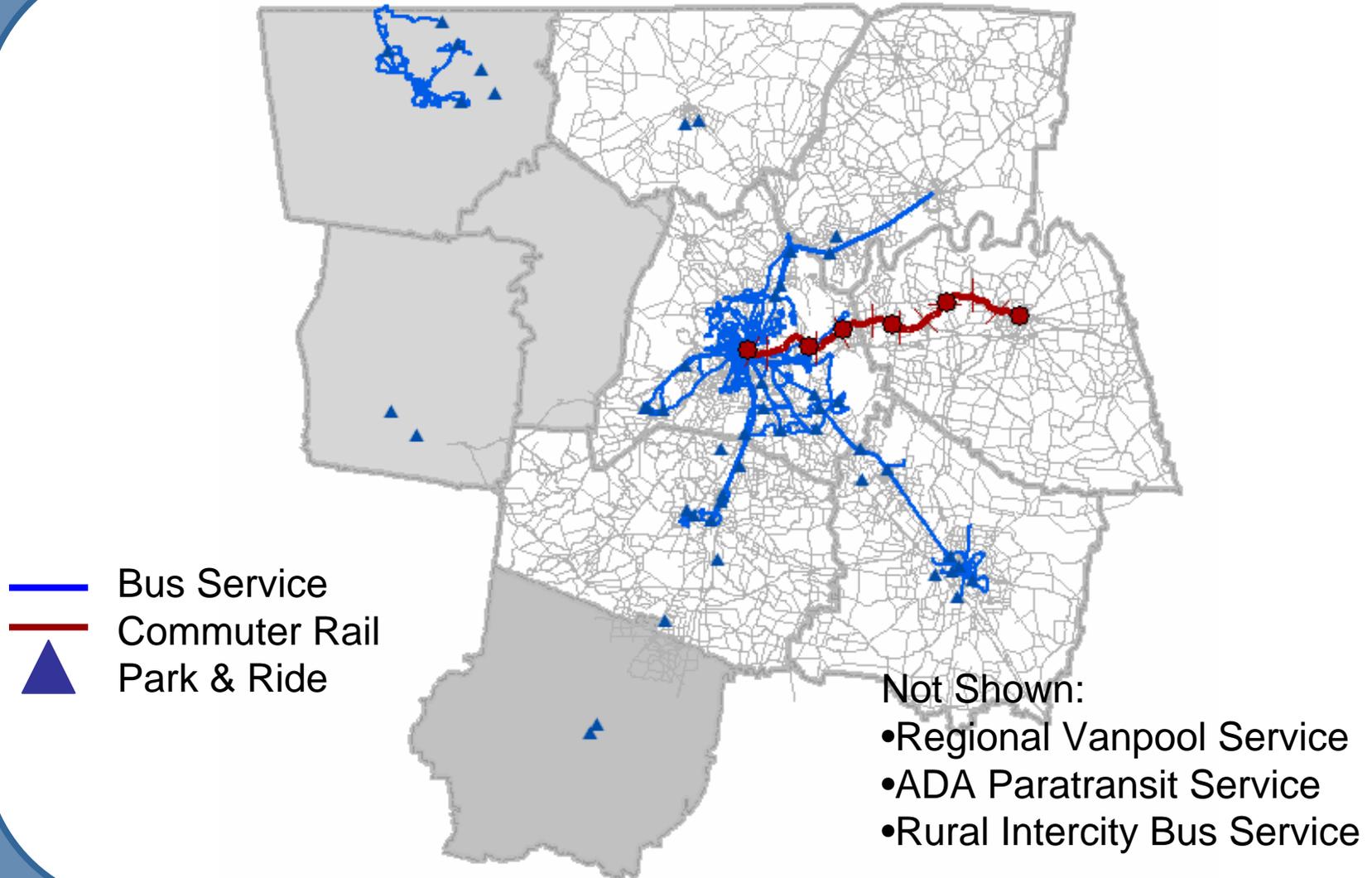
Champions, Communication, Cooperation, Collaboration, Coordination, Commitment  
**A REGIONAL VISION + PLAN OF ACTION + DEDICATED FUNDING**

# A New Regional Plan

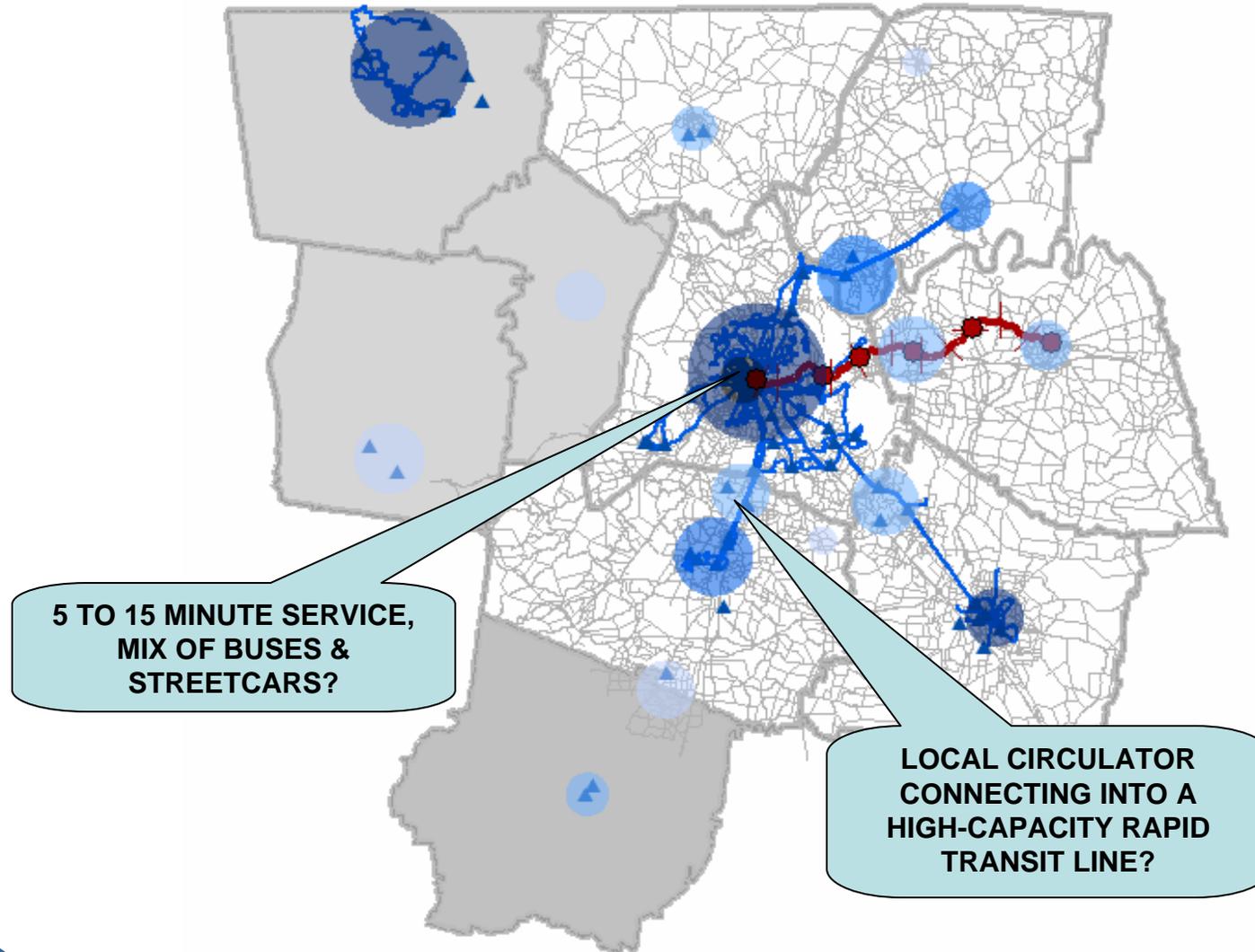
*Livability. Prosperity. Sustainability.*



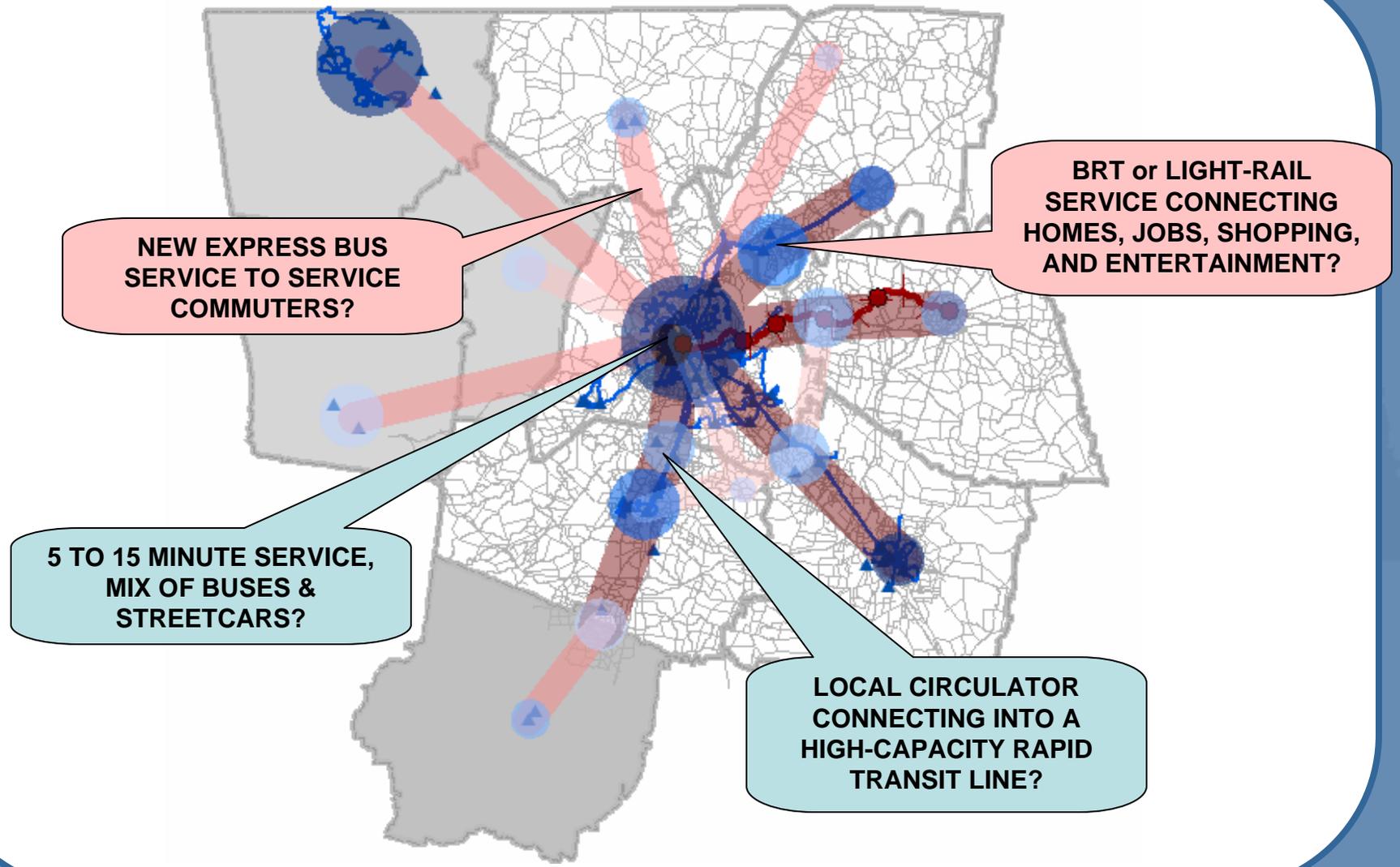
# Existing Transit Services



# Developing a Vision for Transit Expansion



# Developing a Vision for Transit Expansion



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# Think Globally Plan Regionally Act Locally

**Help Shape Your Future with Transportation!**

**Livability. Prosperity. Sustainability. Diversity.**



# Northeast Corridor Mobility Study

## Public Workshop

Madison

November 16, 2009

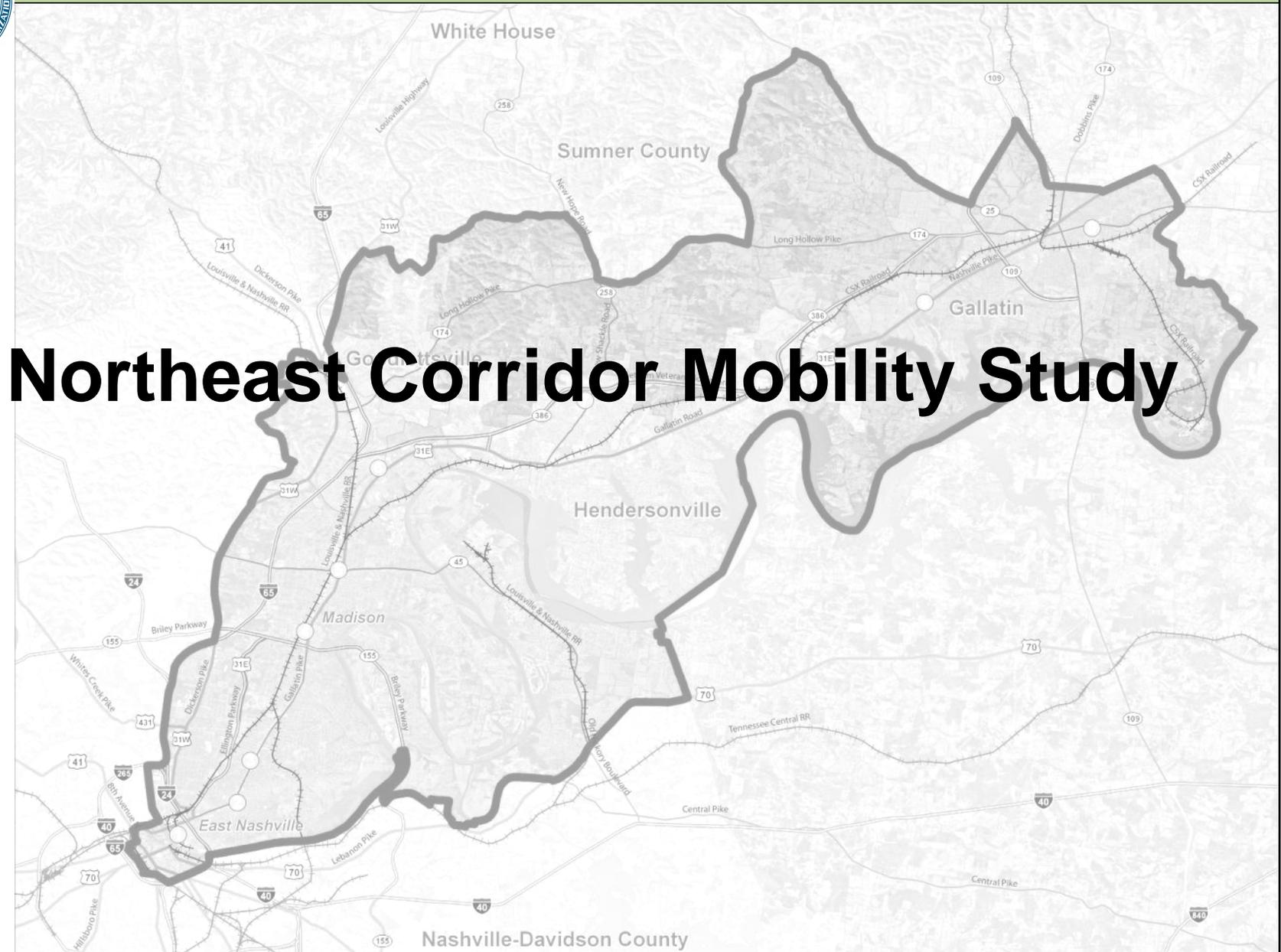


# AGENDA

1. Regional Population Growth Trends
2. Report from Previous Public Workshops
3. Discussion of Alternatives
4. Group Discussion and Feedback
5. Next Steps



NORTHEAST CORRIDOR MOBILITY STUDY



# Northeast Corridor Mobility Study



# GUIDING PRINCIPLES

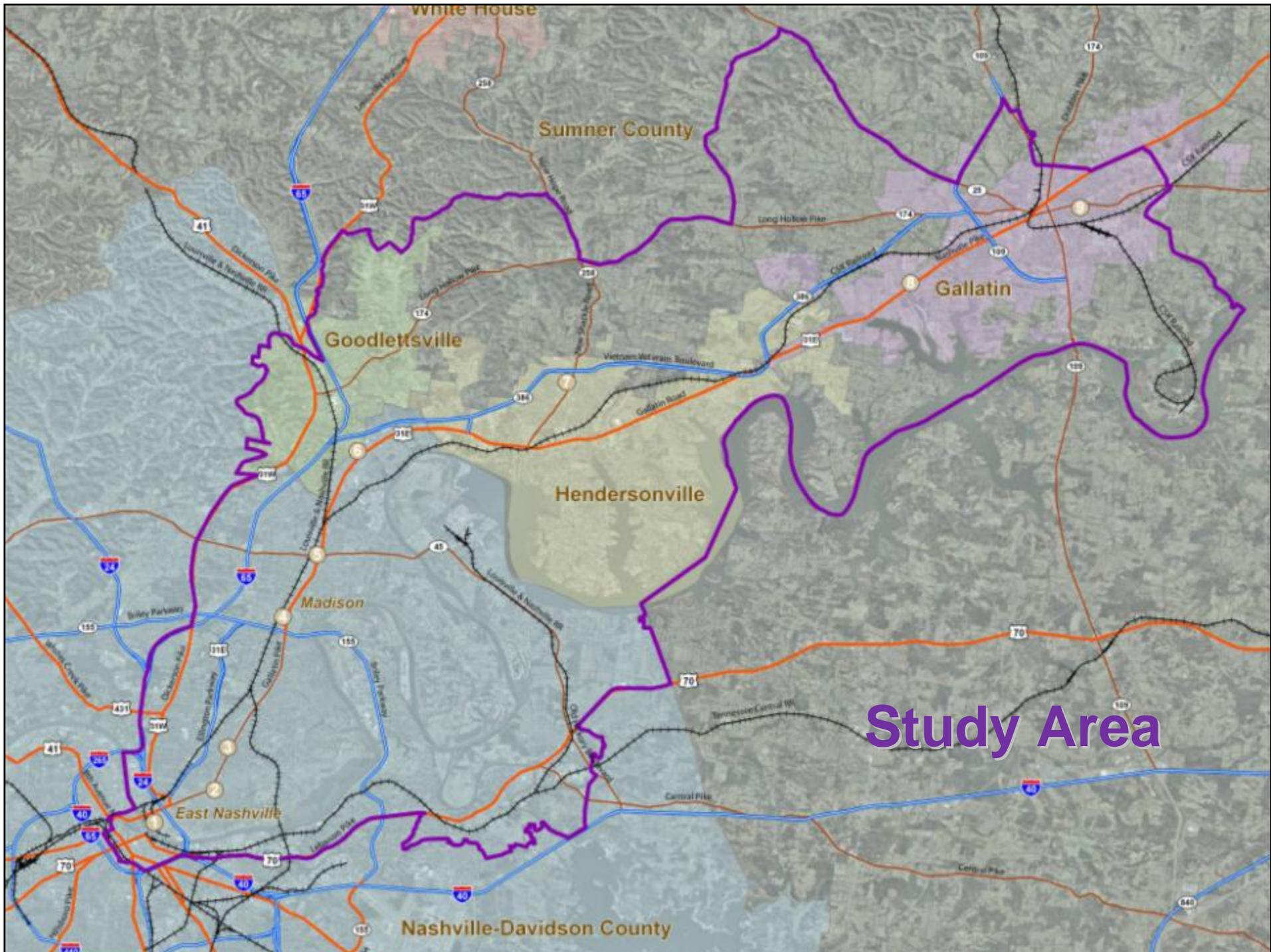
- ▶ **Protect Valuable Resources**
  - ▶ Historic Buildings and Landmarks
  - ▶ Natural Resources
  - ▶ Open Space
  - ▶ Agricultural Lands
  - ▶ Air and Water Quality
  - ▶ Community Character and Identity
- ▶ **Improve Access to Economic Opportunities**
  - ▶ More Options to Commute to Jobs and Schools
  - ▶ Better Accessibility to Local Businesses
- ▶ **Improved Access to Goods and Services**
  - ▶ Protect Local Businesses
  - ▶ Encourage More Diversity in the Local Market Place
  - ▶ Plan for More Mixed-Use Development
- ▶ **Increase Housing Choices**
  - ▶ Preserve Low Density Options
  - ▶ Increase Higher Density Options
- ▶ **Improve Aesthetics throughout the Corridor**



# GUIDING PRINCIPLES

NORTH EAST CORRIDOR MOBILITY STUDY

***Expand and promote alternative transportation options to manage congestion, protect air quality, and facilitate desired walkable development patterns***



**Study Area**



# PREVIOUS PUBLIC WORKSHOPS

1. Community Preference Survey Results
  - Most Preferred Images
  - Least preferred Images
2. Charrette Results Maps

# MOST PREFERRED IMAGES



NORTHEAST CORRIDOR MOBILITY STUDY





# LEAST PREFERRED IMAGES

NORTHEAST CORRIDOR MOBILITY STUDY

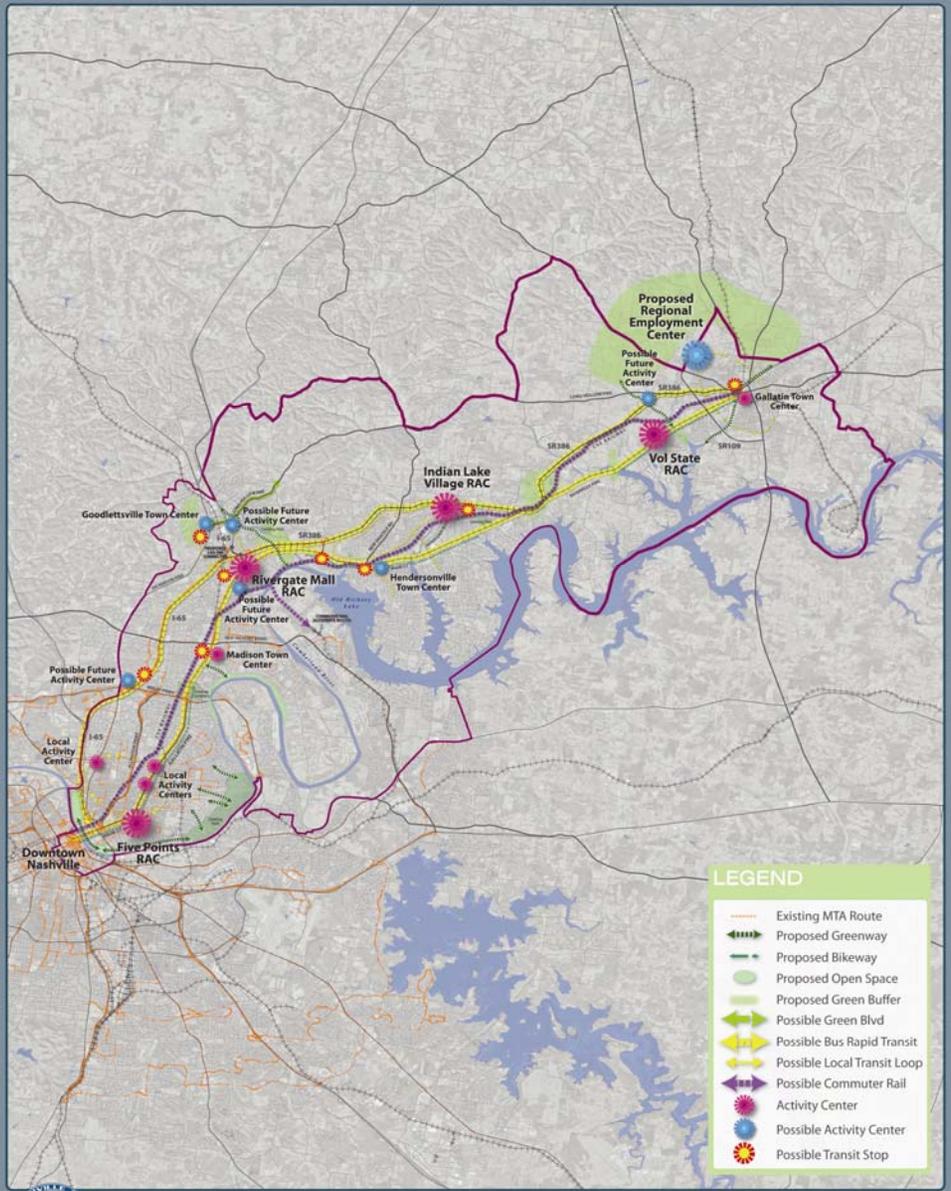




NORTHEAST CORRIDOR MOBILITY STUDY

# STUDY AREA PUBLIC INPUT SUMMARY

**NORTHEAST  
CORRIDOR  
Mobility Study**



## CHARRETTE RESULTS



NORTHEAST CORRIDOR MOBILITY STUDY  
MAY 2008



EDAW | AECOM



# CHARETTE DISCUSSION

NORTH EAST CORRIDOR MOBILITY STUDY





# MADISON/GOODLETTSVILLE PUBLIC INPUT SUMMARY

## NORTHEAST CORRIDOR Mobility Study

NORTHEAST CORRIDOR MOBILITY STUDY



**LEGEND**

	Existing MTA Route
	Proposed Greenway
	Proposed Bikeway
	Proposed Open Space
	Proposed Green Buffer
	Possible Green Blvd
	Possible Bus Rapid Transit
	Possible Local Transit Loop
	Possible Commuter Rail
	Possible Commuter Rail (Alternate Route)
	Possible Future Activity Center
	Possible Activity Center
	Possible Transit Stop

# CHARRETTE RESULTS





# STUDY PROCESS

NORTH EAST CORRIDOR MOBILITY STUDY

**Define Community Goals**  
What are We Trying to Achieve?

**Identify Universe of Alternatives (Options)**  
What are All the Possibilities?

**Initial Analysis on those that Make the Most Sense**  
Preliminary Costs \* Potential Benefits \* Potential Impacts

**Detailed Analysis for Those Preferred**  
Refined Costs \* Ridership \* Economic Potential

**Select Preferred Alternative**  
Recommendations for Short, Mid, and Long-Term Improvements



# TRANSIT MODES



NORTH EAST CORRIDOR MOBILITY STUDY





# TRANSPORTATION ALTERNATIVES

NORTH EAST CORRIDOR MOBILITY STUDY

## WHAT ARE OUR CHOICES?

### LOCAL & EXPRESS FIXED-ROUTE BUS



A system of buses operating on designated routes in mixed traffic for local circulation or longer distance commuting. An important component of any mass transit system, and critical to the success of rapid bus or rail transit.

### BUS RAPID TRANSIT



BRT offers uniquely-branded buses customized to provide a service comparable to LRT—typically traveling in dedicated lanes and hosting premium amenities at stations. Usually easier and cheaper to implement than LRT, but limited capacity.

### LIGHT RAIL TRANSIT (existing ●) (proposed ●)



LRT is a high-frequency train (or streetcar-style) service operating in mixed-traffic and/or in dedicated lanes, powered by over-head electrification. Typically provides more capacity and can be cheaper to operate than BRT in the long-run.

### HEAVY RAIL



A premium intra-regional train service that operates in exclusive right-of-way, allowing it to offer superior travel times. Powered by over-head or third-rail electrification. Usually the most expensive transit mode to build.

### COMMUTER RAIL (existing ●) (proposed ●)



A suburban-oriented service operating during peak travel times to and from a central city—often sharing right-of-way with freight movements requiring a heavy vehicle for safe operation. Usually powered by diesel-electric locomotive.



Simply put, mass transit is no longer just a Northeast or West Coast solution to moving people. In urban areas around the United States, including America's heartland, transit is being seen as a viable and sensible investment that can help communities reach their goals for mobility, environmental sustainability, and economic prosperity.

*"The time is now for action. We must take steps now to ensure the continued economic success of our region." – Mayor Karl Dean, Metro Nashville-Davidson County*

*"We cannot continue along the same path we are on now and expect traffic to get any better. Our citizens deserve more choices." – Mayor Jo Ann Graves, City of Gallatin*

*"If we are serious about transit, and I believe we are, we must begin the process of identifying a stable and reliable source of funding for our vision." – Mayor Rogers Anderson, Williamson County*

*"The business community has made this one of its top priorities." – Ralph Schulz, President, Nashville Area Chamber of Commerce*



# TRANSPORTATION

## Heavy Rail Transit



21 dwelling units per acre

- ▶ Steel wheeled/electric powered vehicles with two or more cars operating on a fully grade separated right of way.
- ▶ Land Use Density 20-25+ dwelling units per acre
- ▶ Station type: Station, platform
- ▶ >1 mile for urban areas to 1-5 miles between stations

# Example Heavy Rail Atlanta



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Heavy Rail San Francisco



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Heavy Rail San Juan



NORTHEAST CORRIDOR MOBILITY STUDY





# TRANSPORTATION

NORTHEAST CORRIDOR MOBILITY STUDY

- ▶ Vehicle with an overhead power supply that can operate in mixed traffic and wide-ranging alignment configurations
- ▶ Land Use Density 20-25+ dwelling units per acre
- ▶ Station type: sidewalk sign, station, platform
- ▶ 1 mile between stations

## Light Rail Transit



21 dwelling units per acre

# Example Light Rail Seattle



NORTH EAST CORRIDOR MOBILITY STUDY



# Example Muni T Line San Francisco



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Portland LRT



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Hiawatha LRT Minneapolis



NORTHEAST CORRIDOR MOBILITY STUDY



# Example T-Rex Denver



NORTH EAST CORRIDOR MOBILITY STUDY



# Example T-Rex Denver



NORTHEAST CORRIDOR MOBILITY STUDY



# Example T-Rex Denver



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Modern Streetcar Portland



NORTHEAST CORRIDOR MOBILITY STUDY



# Example Modern Streetcar Dublin



NORTH EAST CORRIDOR MOBILITY STUDY





# TRANSPORTATION

## Dedicated Lane BRT



7 dwelling units per acre

- ▶ Transportation services using buses to perform premium services on existing roadways or dedicated rights of way. Combines the flexibility of buses with the frequency and travel time advantages of rail transit
- ▶ Land Use Density 7-20 dwelling units per acre
- ▶ Station type: sidewalk sign, station, platform
- ▶ 0.25-2 miles between stations



# Example BRT Eugene - Video

NORTHEAST CORRIDOR MOBILITY STUDY



# Example BRT Cleveland



NORTHEAST CORRIDOR MOBILITY STUDY



# Example BRT Cleveland



NORTHEAST CORRIDOR MOBILITY STUDY



# Example BRT Quito, Ecuador



NORTHEAST CORRIDOR MOBILITY STUDY



# Example BRT Eugene



NORTH EAST CORRIDOR MOBILITY STUDY



Newlands & Co  
[www.nc3d.com](http://www.nc3d.com)



# TRANSPORTATION

- ▶ Electric or diesel train consisting of local short distance travel between a central city and suburbs
- ▶ Land Use Density <4 dwelling units per acre
- ▶ Station type: station, platform
- ▶ 2-5 miles between stations

## Commuter Rail Transit



0.9 dwelling units per acre

# Example Commuter Rail Dallas



NORTH EAST CORRIDOR MOBILITY STUDY



# Example Commuter Rail Nashville



NORTHEAST CORRIDOR MOBILITY STUDY



# TRANSPORTATION VIDEOS



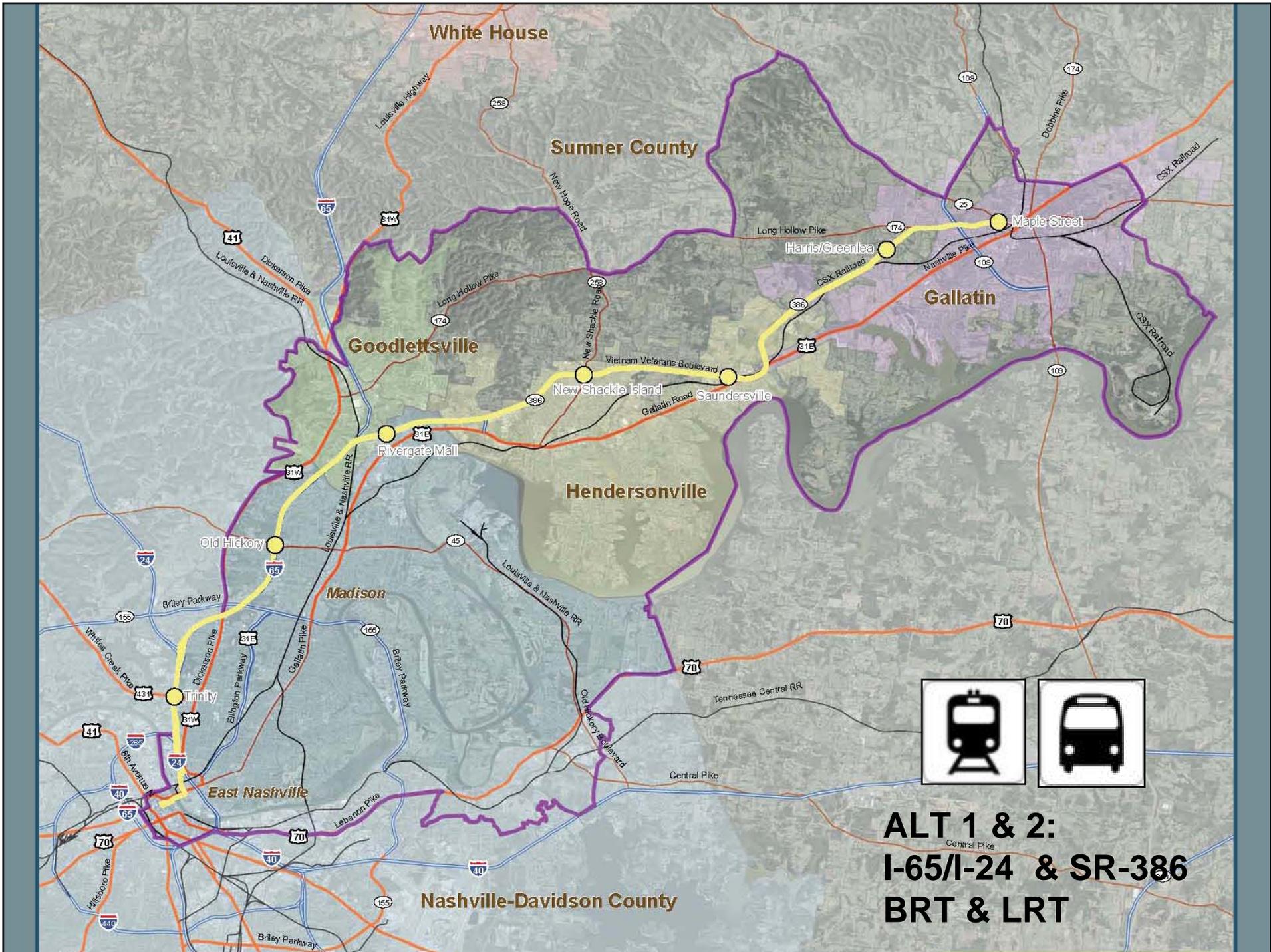
N O R T H E A S T C O R R I D O R M O B I L I T Y S T U D Y



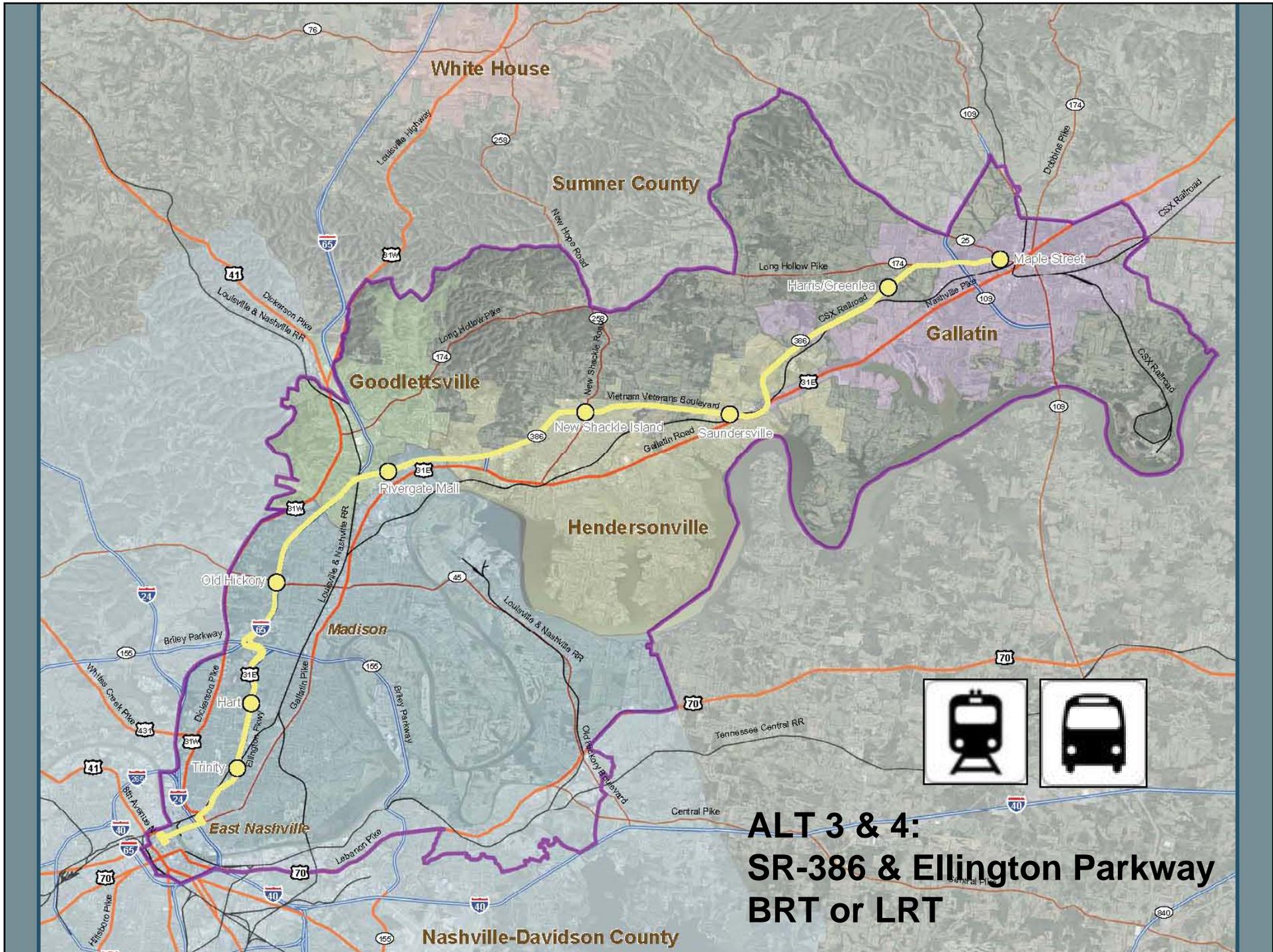


# TRANSPORTATION ALTERNATIVES

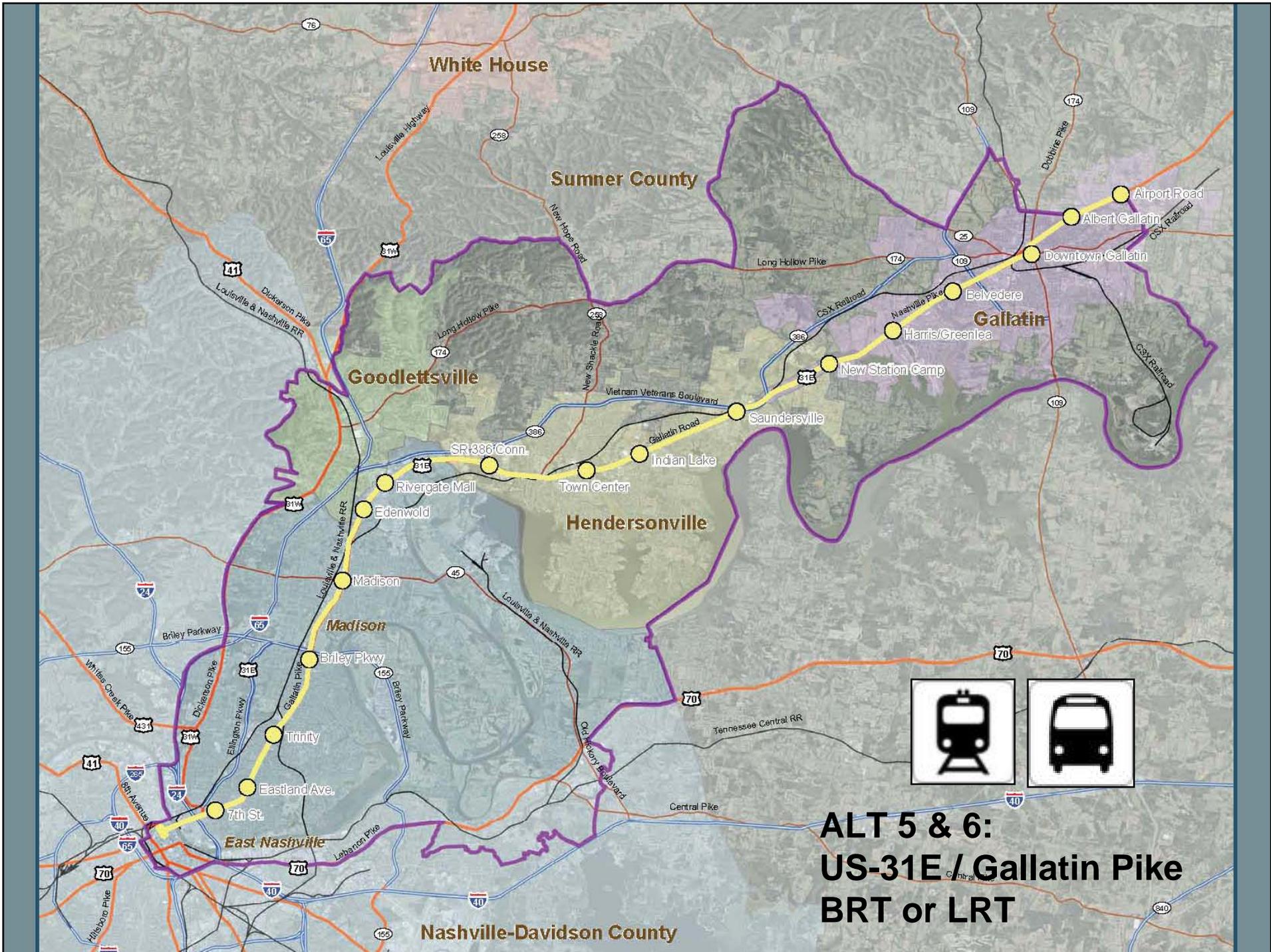
- Alignments:
  - I-65 & SR 386 (Vietnam Veterans Parkway)
  - Ellington Parkway
  - US 31E (Gallatin Pike, Main St., Nashville Pike)
  - US 31W / US 41 (Dickerson Pike)
  - CSX Rail Corridor
  - Hadley Bend Rail Corridor
- Transit Modes:
  - Light Rail Transit
  - Bus Rapid Transit
  - Commuter Rail



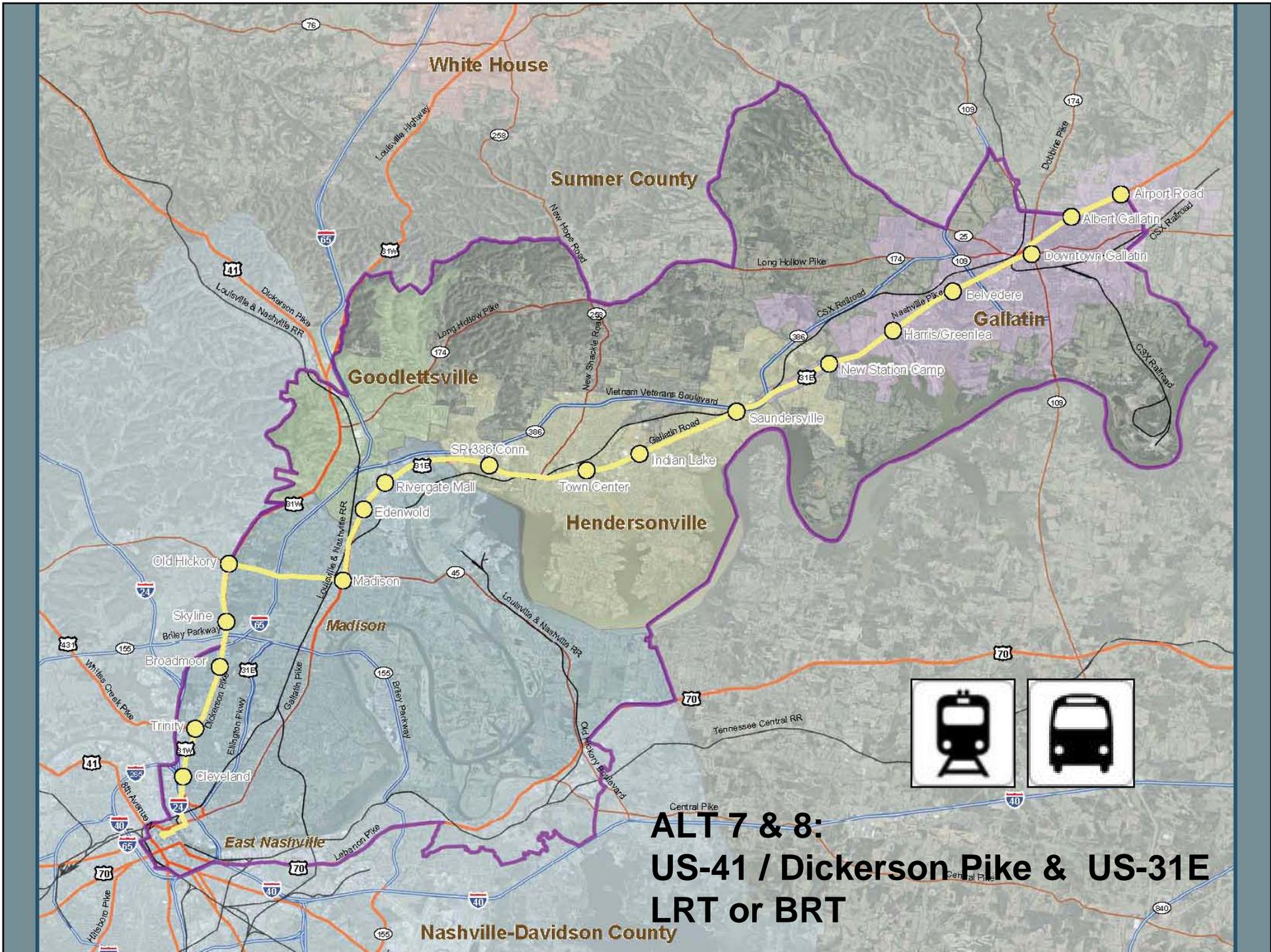

  
**ALT 1 & 2:**  
 Central Pike  
**I-65/I-24 & SR-386**  
**BRT & LRT**

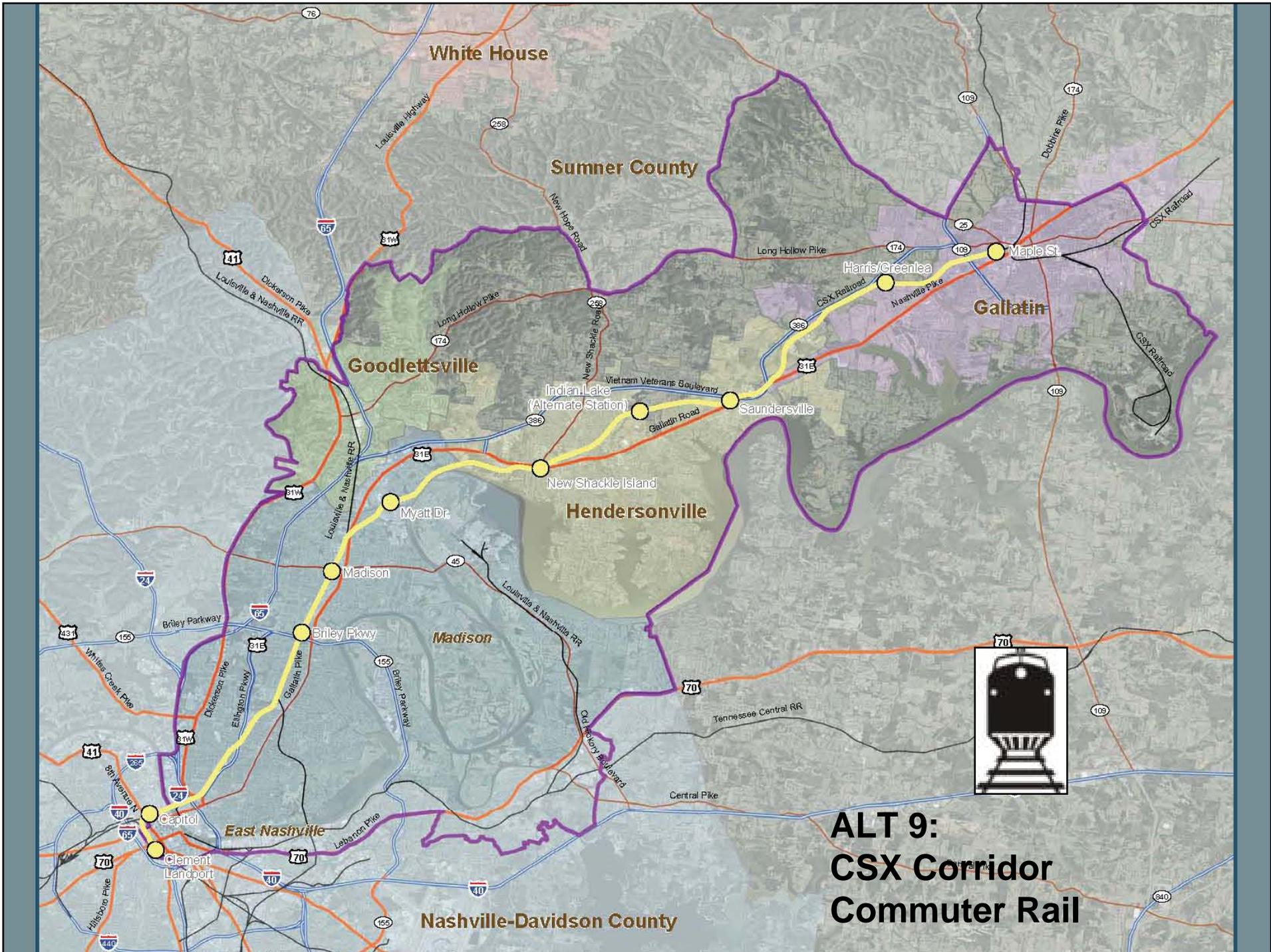


**ALT 3 & 4:  
SR-386 & Ellington Parkway  
BRT or LRT**



**ALT 5 & 6:  
US-31E / Gallatin Pike  
BRT or LRT**





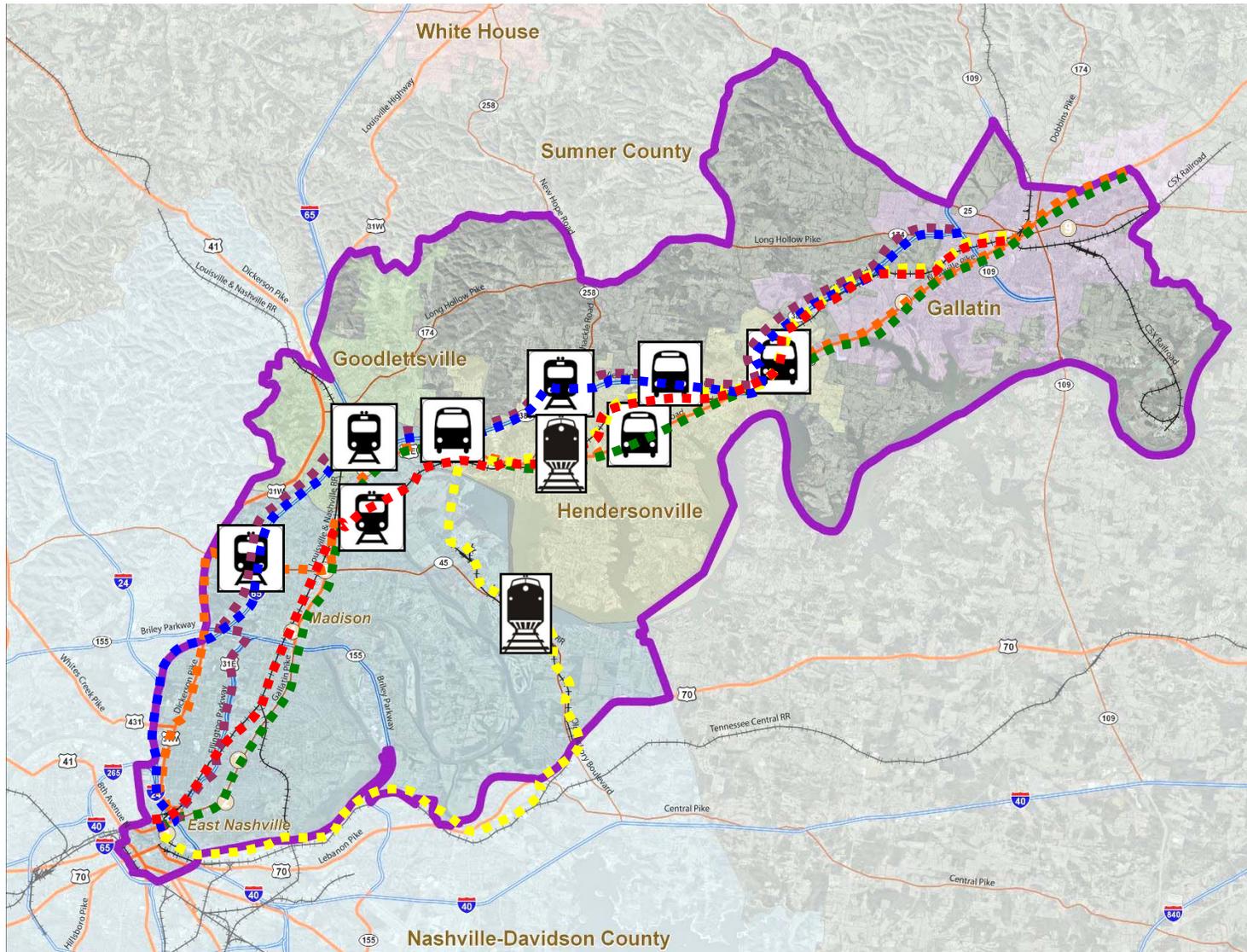
**ALT 9:  
CSX Corridor  
Commuter Rail**



# TRANSPORTATION ALTERNATIVES



NORTH EAST CORRIDOR MOBILITY STUDY





# TRANSPORTATION ALTERNATIVES

- How do we Narrow Down this List for Further Study; From 10 to 3 Alternatives ?

Technical Evaluation +  
Local Elected Officials and Planners +  
Public Input =

**3 Alternatives**



# TECHNICAL EVALUATION

- Quantitative & Qualitative Analysis
- Follows project Purpose and Need
  - Goals
  - Criteria
- GIS analysis for quantitative criteria



# TRANSPORTATION ALTERNATIVES

- Goal 1: Improve **access and mobility** within the study area through identifying mobility solutions and **providing alternative transportation options** on the corridor.
  - End to end travel time (order-of-magnitude)
  - Number of major activity centers (within ½ mile)
  - Forecast year 2035 population within ½ mile of station
  - Forecast year 2035 employment within ½ mile of station



# TRANSPORTATION ALTERNATIVES

- Goal 2: Ensure adequate service is offered to **accommodate zero-car households** and other **transit-dependent populations**
  - Number of zero-car households within ½ mile of stations
  - Number of low income households within ½ mile of stations
  - Number of minority households within ½ mile of stations



# TRANSPORTATION ALTERNATIVES

- Goal 3: Promote **environmental sustainability** through appropriate development patterns while **integrating transportation and land use** to reduce auto and truck trips.
  - Potential for promoting or connecting to TOD developments (qualitative)
  - Qualitative assessment of potential impacts to environmentally sensitive sites, infrastructure, and private property (qualitative)
  - Number of negatively affected parks, wetlands, historic sites, cemeteries, and religious properties within 500 feet (GIS data)
  - Number of disrupted or impacted residences, schools, businesses, or churches within 500 feet (GIS data)



# TRANSPORTATION ALTERNATIVES

- Goal 4: **Steward transportation funds** to incorporate market and economic analysis for a realistic plan, determine development potential, and recommend **incentives for desired development patterns**.
  - Average capital cost range based upon national comparisons and route length
  - Acres of densely/intensely zoned land within ½ mile of stations

<b>Transportation Option</b>	<b>Average Cost per mile</b>
Heavy Rail Transit	\$139 – 323 million
Light Rail Transit	\$45 – 85 million
Bus Rapid Transit	\$3 – 49 million
Commuter Rail	\$1 – 15 million
4-Lane Highway	\$32 – 60 million

\* Commuter rail figure assumes use of existing track



# TRANSPORTATION ALTERNATIVES

- Goal 5: **Improve safety and security** in the corridor while considering the transit/pedestrian/auto interface.
  - Safety of mode depends upon specific alignment design
  - Possibility of using accident data



# TECHNICAL EVALUATION

NORTH EAST CORRIDOR MOBILITY STUDY

**Table 4: Prescreening Evaluation Markings**

Criteria	Measure	Alternatives									
		1	2	3	4	5	6	7	8	9	10
		BRT	LRT	BRT	LRT	BRT	LRT	BRT	LRT	Commuter Rail	
		I-65/I-24	Ellington Parkway	Gallatin Pike	Dickerson Pike	CSX	Hadley				
<b>Goal 1: Improve access and mobility within the study area through identifying mobility solutions and providing alternative transportation options on the corridor.</b>											
End to end travel time (order-of-magnitude) (Gallatin to Nashville)	minutes	46	41	44	40	83	69	99	76	48	60
Number to Major Activity Centers within 1/2 mile	number	3	3	3	3	7	7	4	4	3	1
Forecast year 2035 population within 1/2 mile of station	population	62,300	62,300	62,013	62,013	118,491	118,491	112,509	112,509	49,991	44,310
Forecast year 2035 employment within 1/2 mile of station	employment	123,714	123,714	111,637	111,637	149,291	149,291	173,268	173,268	121,548	51,483
<b>Goal 2: Ensure adequate service is offered to accommodate zero-car households and other transit-dependent populations</b>											
Number of zero-car households within 1/2 mile of stations	households	1,489	1,489	1,839	1,839	5,088	5,088	2,850	2,850	1,796	1,237
Number of low income households within 1/2 mile of stations	households	2,344	2,344	2,763	2,763	6,453	6,453	4,580	4,580	2,302	1,960
Number of minority households within 1/2 mile of stations	households	3,329	3,329	5,236	5,236	10,752	10,752	7,479	7,479	2,873	2,363
<b>Goal 3: Promote environmental sustainability through appropriate development patterns while integrating transportation and land use to reduce auto and truck trips. Additionally, attempt to reduce pollutant emissions to minimize impact on attainment status.</b>											
Potential for promoting or connecting to TOD developments	+ / o / -	o	o	o	o	+	+	+	+	o	-
Qualitative assessment of potential impacts to environmentally sensitive sites, infrastructure, and private property	+ / o / -	+	+	+	+	-	-	-	-	o	-
Acres of potentially affected parks and wetlands within 500 feet.	acres	44.8	44.8	34.5	34.5	44.0	44.0	273.9	273.9	42.6	308.2
Number of potentially affected historic sites and cemeteries within 500 feet.	number	5	5	2	2	14	14	10	10	10	8
Number of potentially affected residences, schools, businesses, or religious facilities within 500 feet	number	1,300	1,300	1,693	1,693	2,699	2,699	2,211	2,211	2,107	2,029
<b>Goal 4: Steward transportation funds to incorporate market and economic analysis for a realistic plan, determine development potential, and recommend incentives for desired development patterns.</b>											
Relative cost to each other as indexed to the average capital cost of all 10 options*	dollars (in \$M)	0.7	1.7	0.7	1.7	0.7	1.6	0.7	1.8	0.2	0.2
Acres of densely/intensely zoned land within 1/2 mile of stations	acres	3,310.2	3,310.2	4,332.2	4,332.2	7,832.6	7,832.6	5,886.6	5,886.6	3,451.3	3,235.5
<b>Goal 5: Improve safety and security in the corridor while considering the transit/pedestrian/auto interface.</b>											
No evaluation criteria	N/A	o	o	o	o	o	o	o	o	o	o
<b>RESULT</b>	Advance/Do Not Advance										

Colored cells indicate performance substantially worse than other alternatives for a given evaluation criteria.

**Qualitative Ratings by Comparison**

- + Favorable
- o Neutral
- Unfavorable

\*Estimated capital costs are based upon cost averages typical for each technology and can vary substantially depending upon the design constraints in any particular corridor.



## TECHNICAL EVALUATION

- Based on Federal Guidance
- Emphasis on Current Trends and Conditions
- Tended to Favor Alternatives that are:
  - Cheapest to Construct,
  - Located near Today's Population and Employment,
  - Demand for Transit in Place, and
  - Travel Time Savings



# LOCAL GOVERNMENT EVALUATION

NORTH EAST CORRIDOR MOBILITY STUDY





# LOCAL GOVERNMENT EVALUATION

- Based on Vision of Local Leadership
- Emphasis on Creating Future Opportunities
- Tended to Favor Alternatives that are:
  - More Focused on Future Economic Growth Potential,
  - Useful in Enhancing Communities' Quality of Life,
  - More Consistent with Desirable Transportation and Growth Plans



## PUBLIC INPUT / EVALUATION

- How do we Narrow Down this List for Further Study; From 10 to 3 Alternatives ?  
Technical Evaluation + Local Government Evaluation (Elected Officials and Planners) =
- **BRT along US 31 E / Gallatin Pike**
- **LRT along Ellington Parkway / SR 386**
- **Commuter Rail along CSX Corridor**
- **Now, YOUR Input ??**



## NEXT STEPS

- Detailed Screening of Three (3) Transportation Alternatives:
  - **BRT along US-31E Corridor**
  - **LRT along Ellington Pkwy / SR-386 Corridor**
  - **Commuter Rail along CSX Corridor**
- Evaluate Variations in Alignment (Spurs/ Deviations)
- Evaluate Modal Combinations
- Forecast Ridership with Transit Model
- Refine Capital Costs based on Corridor
- Estimate Annual Maintenance and Operation Costs



## NEXT STEPS

- Land Use Model Scenarios - Three (3)
- Urban Design Prototype Areas
- Final Recommendation of One (1) Preferred Transportation Alternative
- Possible Alternative Scenario based on Community Vision
- Final Plan



## DISCUSSION

- What comments do you have about the three (3) Alternatives that we discussed during this workshop?
- What other alternatives for transportation in the Northeast Corridor would you like for us to consider?
- What land use and development issues are most important to you in the Northeast Corridor?

[www.nashvillempo.org/northeast](http://www.nashvillempo.org/northeast)



# THANK YOU

N O R T H E A S T C O R R I D O R M O B I L I T Y S T U D Y

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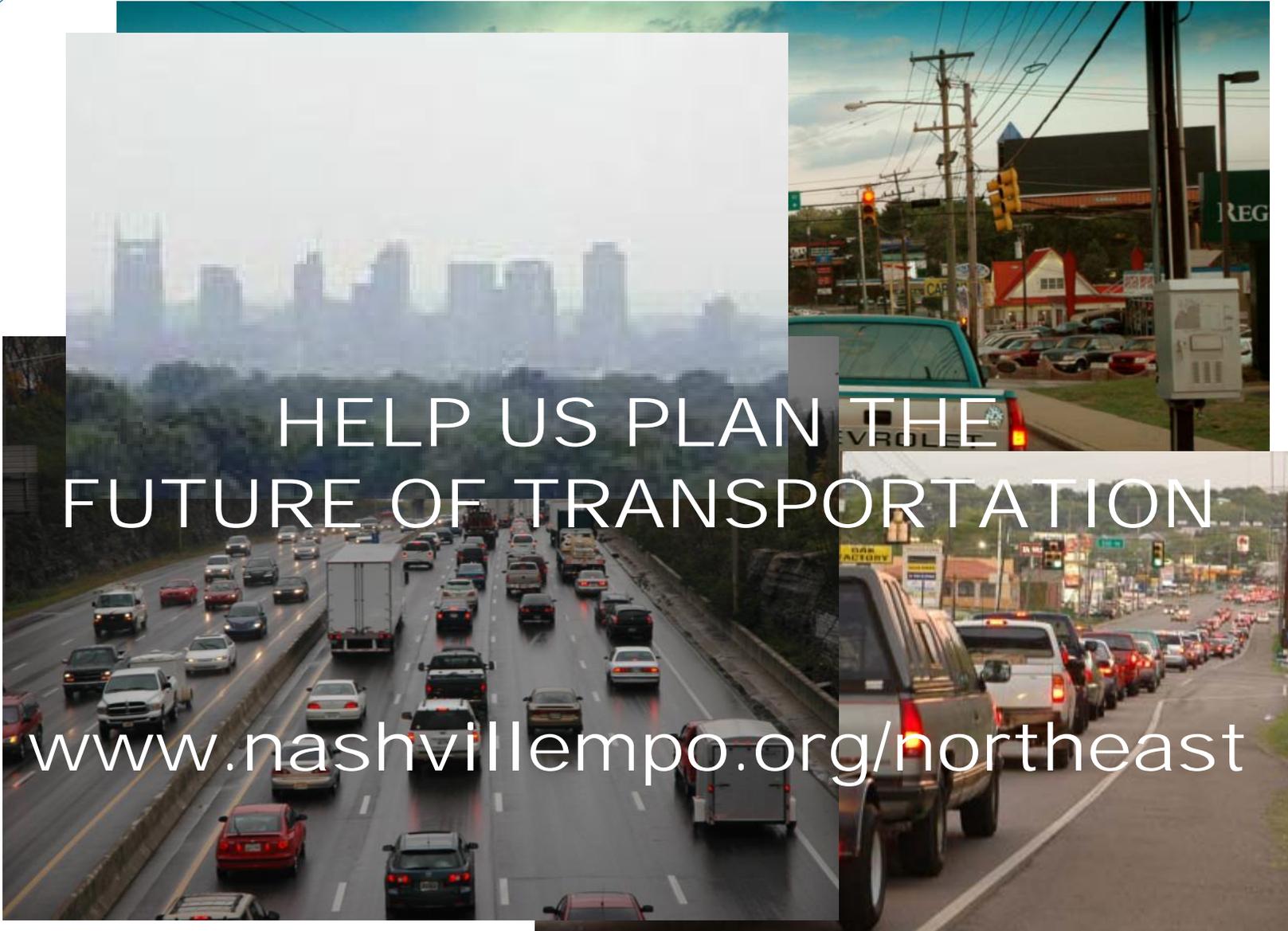
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NORTHEAST CORRIDOR MOBILITY STUDY



# HELP US PLAN THE FUTURE OF TRANSPORTATION

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