Baltimore Regional Transportation Board

2027 LRTP

Introduction to Scenario Planning and Draft LRTP Schedule

March 5, 2024

BMC

Context: Long-Range Transportation Plan (LRTP)

- *Resilience 2050: Adapting to the Challenges of Tomorrow*
  - Federal law requires that region update LRTP every 4 years
  - Forward looking: LRTP lists major roadway, transit and bicycle and pedestrian investments for next 20+ years
- **BRTB determines best investment approach for LRTP**
  - Make progress toward regional transportation goals
    - Accessibility, Mobility, Safety, Improve Existing Infrastructure, Environmental Conservation, Security, Economic Prosperity, Foster Participation, Promote Informed Decision-Making
  - Address **future needs / conditions**

Context: LRTP and Project Evaluation

- **Evaluate candidate projects:**
  - Consider current regional and local needs and priorities
  - Apply evaluation criteria that focus on regional goals
  - Select major projects that meet needs/criteria
- **Run Travel Demand Model on projects:**
  - Apply population and job growth projections: How many people? How many jobs? Where?
  - Given projections, how might selected projects affect travel
  - Predict where people will travel (work, shopping, etc.) and how they will travel (drive alone, carpool, transit, bike/walk, etc.)
- **Test potential effects of projects: air quality, environmental justice analysis, environmental mitigation measures**

Addressing Future Needs and Uncertainties

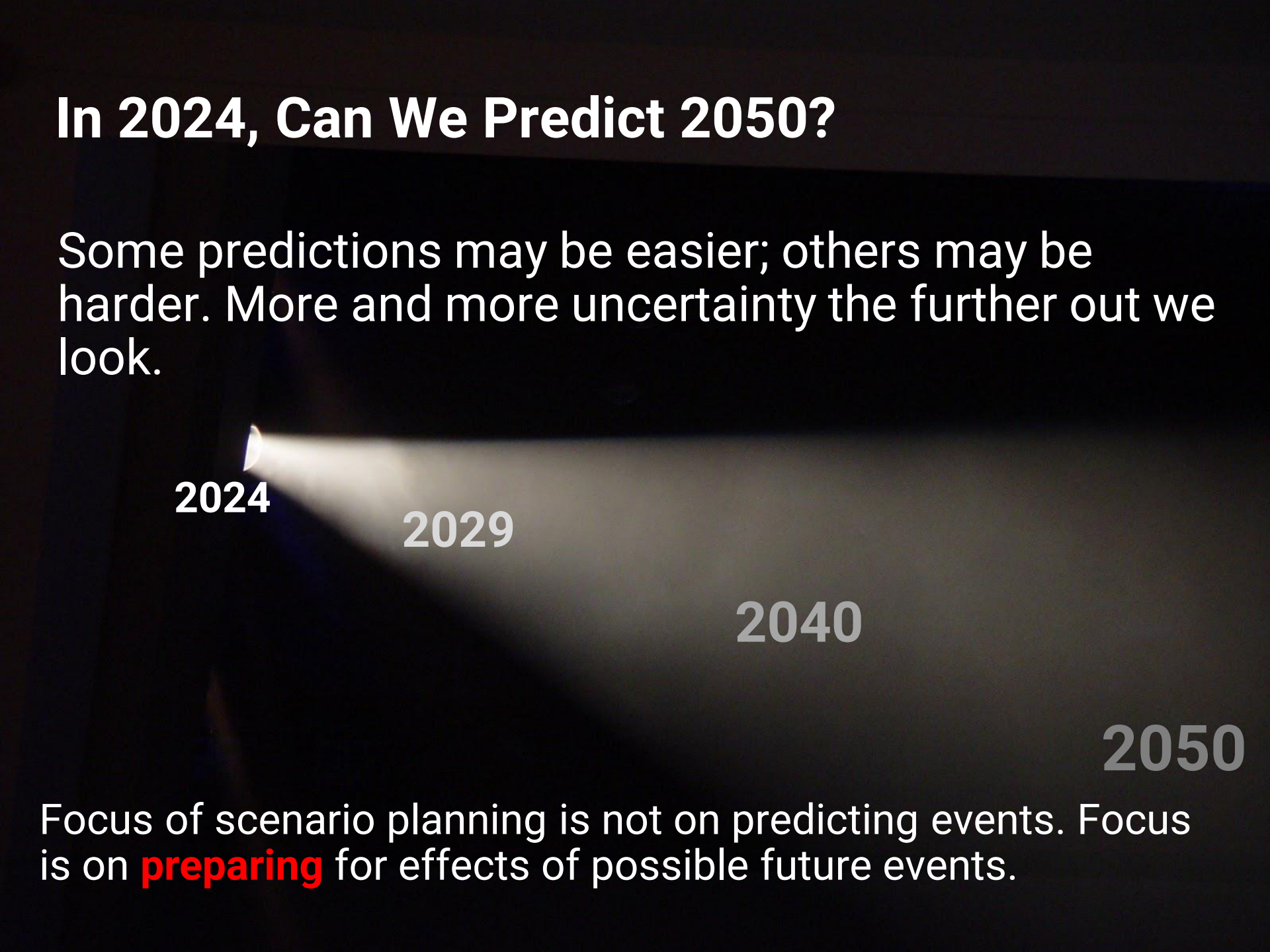
- **In addressing future needs, should we consider other critical factors besides population/employment projections, projects in the preferred alternative, and model predictions?**
- **Other Forces: Socio-demographic, technological, economic, environmental, political**
  - Think about possible outcomes of these forces? What would these outcomes mean in terms of our regional goals?
  - How might these forces impact transportation equity?

Scenario Planning

- **Enhance and expand our thinking about multiple possible futures to help the BRTB make more informed decisions**
- **Consideration of different variables that influence and are influenced by transportation to support a broader set of community goals**
  - Normative vs Exploratory
  - External factors: technology, environmental patterns, macroeconomic conditions
  - Policy choices: land use, infrastructure investments, transportation funding mechanisms
  - Interplay between external factors and policy choices
  - Identify strategies or policy options that best “hold up” across the spectrum of possible future conditions

In 2024, Can We Predict 2050?

Some predictions may be easier; others may be harder. More and more uncertainty the further out we look.



Focus of scenario planning is not on predicting events. Focus is on **preparing** for effects of possible future events.

Scenario Planning: Setting the Stage

- **Determine desired outcomes**
  - **Education and awareness** of uncertainty and potential futures
  - Identify preferred combination of **strategies**
  - Identify concrete policy and investment **actions**
- **Who is involved? Scenario development and analysis in coordination with…**
  - BRTB and Subcommittees; Transportation CORE; other government agencies, non-profits, community organizations and subject matter experts; public input

Scenario Planning: Setting the Stage

- Identify Variables or Driving Forces based on areas of uncertainty and interest for our region
- Potential Variables and Driving Forces to Consider:
  - **Transportation policies or investment strategies** exploring different packages of transportation solutions as well as transit fare and road user pricing strategies;
  - **Land use** scenarios exploring the distribution of population and employment;
  - **Housing and affordable housing** scenarios exploring the impacts of locating forecasted household growth in certain areas in the region and/or increasing the supply of housing in the Baltimore region
  - **Technology** scenarios exploring the adoption of electric vehicles (personal and commercial), Connected and Autonomous Vehicles, and electric vertical take-off and landing aircrafts
  - **Post-pandemic** scenarios regarding work-from-home and use of commercial space (ongoing UPWP study on this topic)
  - Many other possible demographic, economic, environmental, health, and social uncertainties

Scenario Planning: Setting the Stage

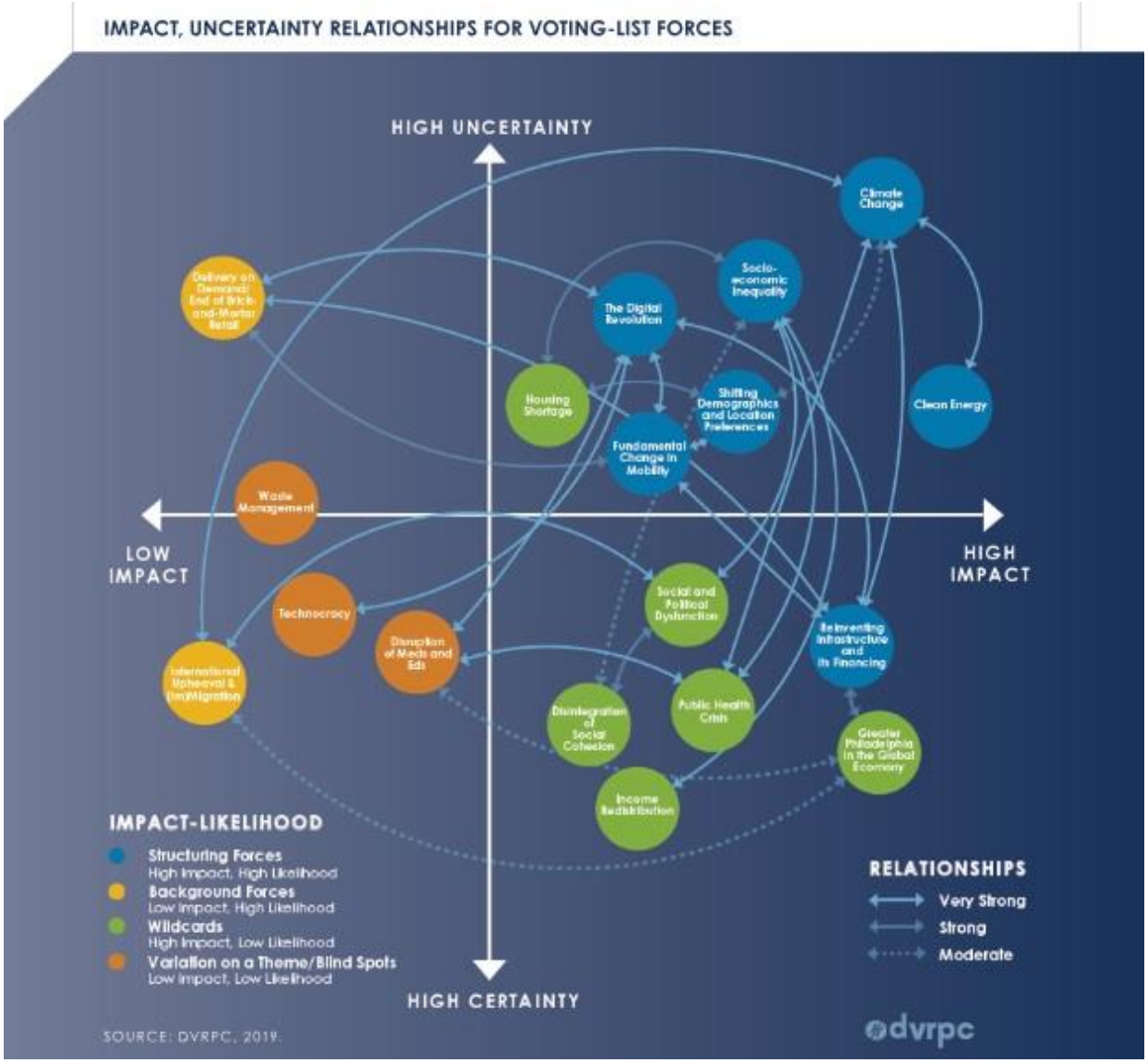
- **Example: Housing and Affordable Housing**
  - Increasing focus on coordination of housing and transportation
  - Housing supply and affordability identified in 2023 Maryland State of the Economy Report as a key factor in Maryland's high COL and slowing economic growth
    - "Housing availability and affordability was the top concern in every roundtable discussion across the state."
- **Identify…**
  - Opportunity Areas
  - Areas with high walkability to transit
  - Areas with jobs-housing imbalance (where jobs outnumber residents)
- **Scenarios could explore impacts of…**
  - Locating higher proportions of forecasted household growth and jobs in areas where these zones intersect
  - Building additional housing (beyond forecasted growth) in the region for households that currently commute into the Baltimore region from areas outside the region

Scenario Planning: Methods

- Wide variety of approaches
- Quantitative analysis of identified scenarios
  - InSITE Travel Demand Model
  - VisionEval: Simplified modeling environment enabling rapid analysis of many combinations of variables of interest
- Qualitative analysis
  - Scenario workshops and focus groups
    - DVRPC Futures Group conducts quarterly discussions and exploratory scenario planning
    - 2014 BRTB Scenario Thinking brought together stakeholders from the public, higher education, MDOT, local jurisdictions, business and advocacy groups
  - Surveys
    - CMAP (Chicago) uses interactive online tools, surveys and public meetings
- Communication is Key: Development of interactive tools and graphics to **communicate the potential tradeoffs** associated with scenarios

Example: Exploratory Scenario Planning with Qualitative Methods

- DVRPC (Philly)
- 100+ forces consolidated to 18
- High uncertainty and impact forces:
  - Digital Revolution and Change in Mobility
  - Socioeconomic Inequality, housing shortage and shifting demographics and location preferences
  - Climate Change and Clean Energy



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Example: Exploratory Scenario Planning with Qualitative Methods

Example: Scenario Planning with Travel Demand Modeling

- Northern Virginia Transportation Authority used scenario planning to explore a set of plausible scenarios based on goals and core values
- Vision: "Northern Virginia will plan for, and invest in, a safe, equitable, sustainable, and integrated multimodal transportation system that enhances quality of life, strengthens the economy, and builds resilience."

Goal	Objective	Performance Measure	Weight	Alignment with Core Values
Mobility: Enhance quality of life of Northern Virginians by improving performance of the multimodal transportation system	A. Reduce congestion and delay*	A1. Total Person-Hours of Delay in autos	10	Sustainability
		A2. Total Person-Hours of Delay on Transit	10	Equity
	B. Improve travel time reliability*	B1. Duration of Severe Congestion	10	Sustainability, Safety
		B2. Transit person-miles in dedicated/priority ROW	10	Equity, Sustainability
Accessibility: Strengthen the region's economy by increasing access to jobs, employees, markets, and destinations for all communities	C. Improve access to jobs*	C1. Access to jobs by car, transit, and bike	10	Sustainability
		C2. Access to jobs by car, transit, and bike for EEA populations	10	Equity
	D. Reduce dependence on driving alone by improving conditions for people accessing transit and using other modes	D1. Quality of access to transit and the walk/bike network	15	Equity, Sustainability, Safety
Resiliency: Improve the transportation system's ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.	E. Improve safety and security of the multimodal transportation system	E1. Potential for safety and security improvements	10	Safety
	F. Reduce transportation related emissions	F1. Vehicle Emissions	10	Equity, Sustainability
	G. Maintain operations of the regional transportation system during extreme conditions*	G1. Transportation System Redundancy	5	Equity, Safety

Core Values: Equity Safety Sustainability

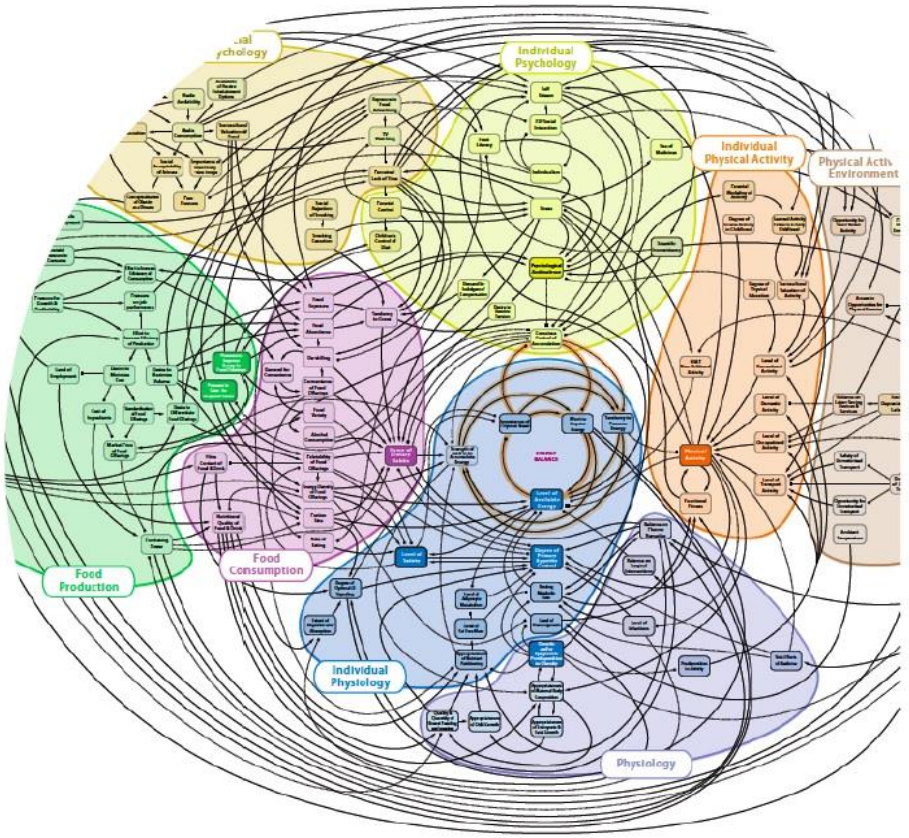
Example: Scenario Planning with Travel Demand Modeling

Scenario	Assumptions
Post-pandemic New Normal: What if trends observed during the pandemic continue into the long-term future?	• Reduction of work-related trips (21%) and shopping trips (5.6%) • Increase in delivery trips (1 delivery for every 3 shopping trips removed) • Increase in non-motorized trips by 5%
Technology: Focus on implementation of CAV, Shared, Electric Vehicles (CASE vehicles)	• Assumes market penetration for Private vehicles (20%); TNCs (100%); Large trucks (33%); Transit (not automated); Shuttle buses (100%) • Lower operating costs • Changes to trip making: more and longer trips; Zero-Occupancy Vehicle trips/parking • Capacity increase: Freeways 15%; Major Arterials 5% • Automated Shuttles available at all transit stations
Incentives/Pricing: Implementing transportation incentives and pricing mechanisms to manage travel demand	• Free transit • Shift in travel times from peak hours • VMT Pricing on all roads: 25¢ peak, 12¢ off-peak (discounts for lower-income households) • Increase in parking costs across the region

Example: Scenario Planning with VisionEval

- ARC (Atlanta) conducted scenario planning to understand the impact of potential regional strategies on climate change and air quality
- Process emphasizes the difficulty and complexity associated with predicting travel behavior for the next 10, 20, 30 years

Complexity of Simulating Travel Pattern to understand all connections of human behavior



Example: Scenario Planning with VisionEval

- Travel demand modeling is complex and takes a long time
- VisionEval is an open-source modeling tool
- Enables analysis of many more combinations of variables than would be possible with InSITE

VisionEval Variables (example from ARC):

Population

- 15% growth in population from 2050 base model

Telework

- 50% of telework

Employment

- 60% growth in employment from 2050 base model

Electric vehicles

- 95% of battery electric vehicles (BEV) in households

Road capacity

- 50% growth in freeway and artery miles from 2050 base model

Fuel costs

- Fuel cost: $8.00 per gallon (retail cost before tax)
- Power cost: $0.30 per kilowatt-hour (retail cost before tax)

Transit service

- 50% growth in all transit revenue miles from 2050 base model

Fuel/VMT tax

- Fuel tax: $0.90 per gas gallon equivalent of fuel
- Vehicle Miles Traveled (VMT) tax: $0.90 per gas gallon equivalent of fuel

Congestion charges

- $1.00 per vehicle traveled mile on freeways during periods of severe and extreme congestion

$2^9 = 512$ future scenarios

Scenario Planning: Metrics for Evaluation

- Use identified methods to evaluate possible outcomes of scenarios in terms of what is important to us → LRTP Regional Goals
- Identify performance metrics to evaluate scenarios, such as:
  - Access to jobs and other key destinations
  - Transit ridership and other non-auto means of transportation
  - Travel times
  - Measures of congestion
  - Emissions and exposure to environmental hazards
  - Climate resilience
  - Transportation costs
  - Mode share

Scenario Planning and Equity

- Scenario planning exercise should emphasize the potential impacts on vulnerable populations in the Baltimore region
- Related to recommendations from the 2023 Equity Scan. In particular…
  - Define what equity means for the region. What populations do we want to focus on?
  - Identify strategies/scenarios that advance equitable outcomes that work well under a variety of conditions

Scenario Planning: Key Questions for Scope

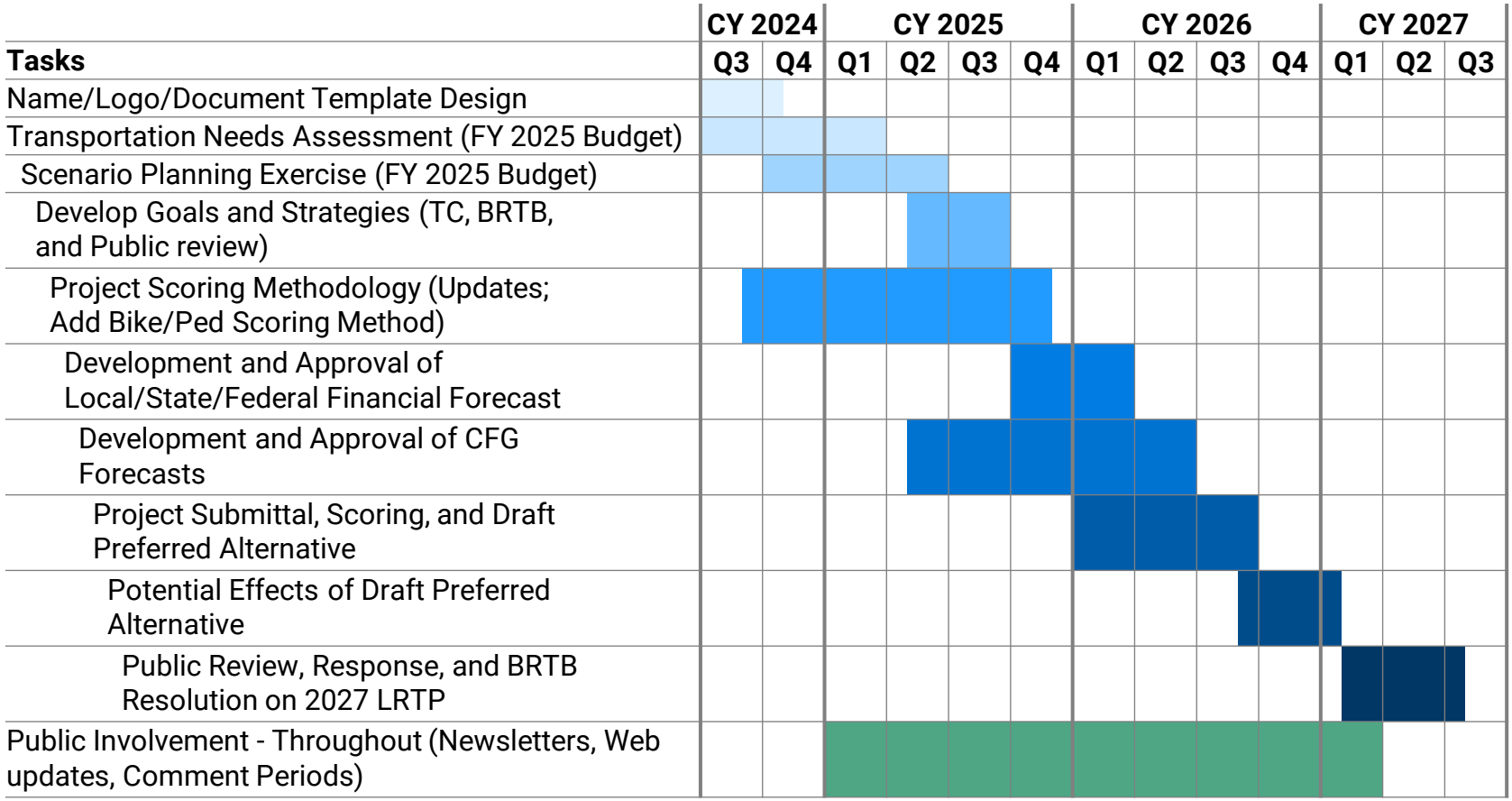
- What are our goals and objectives?
- What are we most interested in exploring?
- What methods are needed to analyze scenarios?
- What performance measures will we use to evaluate scenarios?
- How can this exercise improve transportation equity?
- How will we communicate findings?
- Based on scenario findings, are there steps the BRTB can take now to prepare for the future?
  - Education and awareness regarding uncertainty
  - Inform LRTP goals and strategies and project evaluation
  - Identify scenarios and/or policies for further study

Scenario Planning: What's next?

- **$250,000 in FY 2025 UPWP -> Hoping to release RFP in July**
- **For us**
  - Staff have been reading and researching work by other MPOs and possible methods
  - BMC staff will continue to discuss and refine recommendations
- **For you**
  - Continued committee input needed on RFP scope.
  - Think about these key questions, discuss with your BRTB member
  - What are your experiences with scenario planning?
  - What topics/areas of uncertainty are you interested in gaining more information on?

2027 LRTP – Draft Schedule

- 4 years seems like a long time, but…
  …LRTP tasks build on each other



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