Guidance for Scenario Planning
Objective and Outline
Scenario Planning is important because:

» Organizations have found that a rapidly-changing future frustrates point-to-point forecasting techniques

» It helps transportation agencies plan for futures that are uncertain and establish signposts where plans can be reconsidered

» It provides a framework for the evaluation of different types of risk and risk response
This guidance is specifically intended to help small-to-medium-sized organizations

» Pass down lessons from larger organizations

» Disseminate best practices through the industry
Guidance for Scenario Planning

This presentation will:

» Introduce the theory and terminology of Scenario Planning

» Walk through the process of developing a Scenario Planning study:
  – Defining a question
  – Identifying variables
  – Envisioning scenarios
  – Achieving objectives

» Introduce tools that assist Scenario Planning
  – Communication and engagement tools
  – Modeling tools
Theory of Scenario Planning
Continuum

First, define a **continuum** – the “x axis” of our plot

The continuum is the “independent variable.” What you are testing for on the y axis will change as you move from left to right.

One example of a continuum is time. Another, less concrete example is a sequence of decisions.
Variables

Next, let’s define a variable – the “y axis” of our plot

Variables can be actors, factors, or sectors:
- Actors are people or organizations whose actions impact the future
- Factors are concepts, constructs, or characteristics
- Sectors are the arenas where actors and factors interact

Let’s use population, and look at it over time.
Trends

Anything that happens between today and a horizon, or between horizons, is a trend.
Your trends might be **intuitive**...
Trends

Or they could be **formal** – informed by data or defined by you.
Outcomes

As the continuum progresses, you may end up with discrete outcomes.
Decisions

Alternatively, maybe you know the outcomes but need to describe how you get there...

For example, you want to evaluate several potential policy decisions.
Decisions

You can establish **decision points**:

In this example, the first decision leads to a certain outcome if things go one way, but to two potential outcomes in the other.

That’s a second decision point.
**Scenarios**

Your decisions may be based on trends. Let’s combine our two variables together.

Your policies impact population growth.

When we reach our second horizon, we have combinations of policy and population outcomes.

These are *scenarios*.

Of course, there can be many variables and they can all interact to produce scenarios together.

Alternatively, you can define a subset of scenarios based on variables independently.

We can change a policy to influence land use. We’ll do it in response to population growth.
Normative

Let’s look at our decisions here...

Since we know what will happen when we decide a certain way, we can choose which scenario we want.

Thus, our policies (or investments) are determined by what we think is good.

This is called normative planning.

We can change a policy to influence land use. We’ll do it in response to population growth.
But what if several scenarios are equally possible?

We select policies that will work for as many plausible futures as possible.

That’s called **explorative** planning.
And if we know what’s going to happen and we need to be ready for it...

That’s **predictive** planning.
Advice for Scenario Planning
Defining a Question

A question is defined by:
» A subject (“our region” or “our transit system”)
» A timeframe/horizon (“by 2050”)
» An objective (“in order to prioritize investments”)

Questions can be...
» Predictive | What do we think is going to happen?
» Normative | How can we make something desirable happen?
» Explorative | What could possibly happen?

In practice, you will combine these
» Fully predictive may seem to lack imagination
» Fully normative may seem biased
» Fully explorative may seem wasteful
Identifying Variables

Commonly-cited variables adapted from NCHRP 750: Foresight Series

- **Economics**
  - Income, unemployment, GDP, inequality
  - Global and local trade levels, shipping, supply chains
  - Domestic manufacturing, online retailing

- **Environment and Land Use**
  - Water scarcity, sea level rise, fires
  - Emissions and air quality
  - Development rates and open/rural land preservation

- **Technology**
  - Printed fabrication/micromanufacture
  - Automation in manufacturing and transportation

- **Transportation**
  - Transportation network companies - TNCs (Uber/Lyft), mobility as-a-service
  - Mode choice

- **Demographics**
  - Aging population
  - Growth rate, inward/outward migration, labor force participation
Envisioning Scenarios

Scenarios are defined by trends
» The current trend accelerates
» The current trend maintains
» The current trend plateaus, decelerates, or reverses

Scenarios can be based on
» A single variable, trend, or event
» Multiple variables interacting
» Land use patterns
» Finances

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Achieving Objectives

What is your study meant to **inform**?
» What practices can we change?
» What rules can we make?
» What efforts can we empower?
» What investments can we make?
» What should our community prepare for in their lives?

How you select recommended actions depends on **philosophy**
» Predictive | Future is certain, so actions address impacts
» Normative | Future is desirable, so actions make it more likely
» Explorative | Actions address as many futures as possible

Prioritize what is helpful, not what is wanted most
» Seek help from advisors and input from engaged stakeholders
Tools for Scenario Planning
The most effective tool is in-person engagement
- Attend fairs, block parties, other local gatherings
- Markers, posters, post-it notes, other low-tech feedback gathering tools
- Advisory committees of subject-matter and local history experts, other luminaries

Many types of software tools
- Survey (Google Forms, SurveyMonkey)
- Mapping (Google Maps, ArcGIS Online)
- Project website (Squarespace, Wix)
- Blogging, livestreaming, podcasting
- Packages (MetroQuest, Bang the Table, Public Input)
For small agencies, consider the following:

- Take advantage of the cyclical process of long-range planning, starting small and building with each round.
- Partnerships with State agencies (DOTs, large MPOs) who already own models and pooled fund/effort with peer agencies can spread modeling capabilities without breaking the budget.

Modeling tools may include:

- Land use models
  - CommunityViz
  - CorPlan
  - EnvisionTomorrow
  - SPARC/INDEX
  - Urbanfootprint
- Travel demand models
  - Cube
  - Emme
  - TransCAD
  - Visum
- Econometric models (REMI TransSight, TREDIS)
- Federal models (FHWA, EPA, CDC tools)
Takeaways
Scenario Planning is mostly about imagining the future collaboratively with others in your organization and in your community. What do you think could happen, and what would that mean for your region? Imagining doesn’t cost a dime.

Every community, no matter how big or small, is full of smart folks. Public outreach and advisory committees can be very inexpensive and very high-value — not only can they reveal public preferences and beliefs you may not have anticipated, they also lend your effort credibility, integrity, and approachability in the eyes of your public and stakeholders.

Your region, state, and country are full of potential partners that can pool resources or share their advantages with you. Also, Long-term planning is cyclical, and you don’t need to get all the way there the first time. If you don’t have the staff time to spend all at once, do one step for this LRTP and make a plan for what you’ll tackle next time.