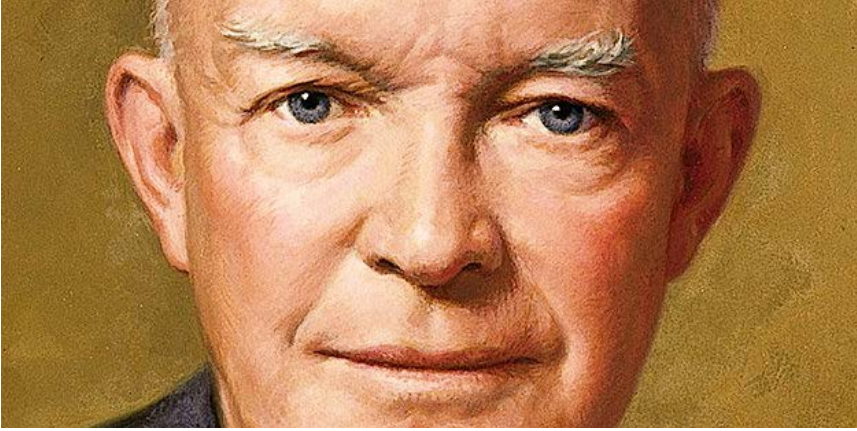


Embracing Uncertainty

Reducing Our Blind Spots
with Scenario Planning

2016 *Use of Scenario Planning in
Transportation Planning Conference*

Thera Black, SCJ Alliance



In planning for battle, I have always found that plans are useless but planning is indispensable.

Dwight D. Eisenhower

Billboard

HOT 100

1995-2015

Fracking

Sharing
Economy

Great
Recession

Big Data

AV/CV

Millennials

HOT

The Cloud

Smartphones

Katrina
& Sandy

3D
Printing

9/11

Internet
of Things

How many of these were in your 20-year plans from the mid-late 1990s? What will your 2030 or 2040 plan miss? Will it matter?



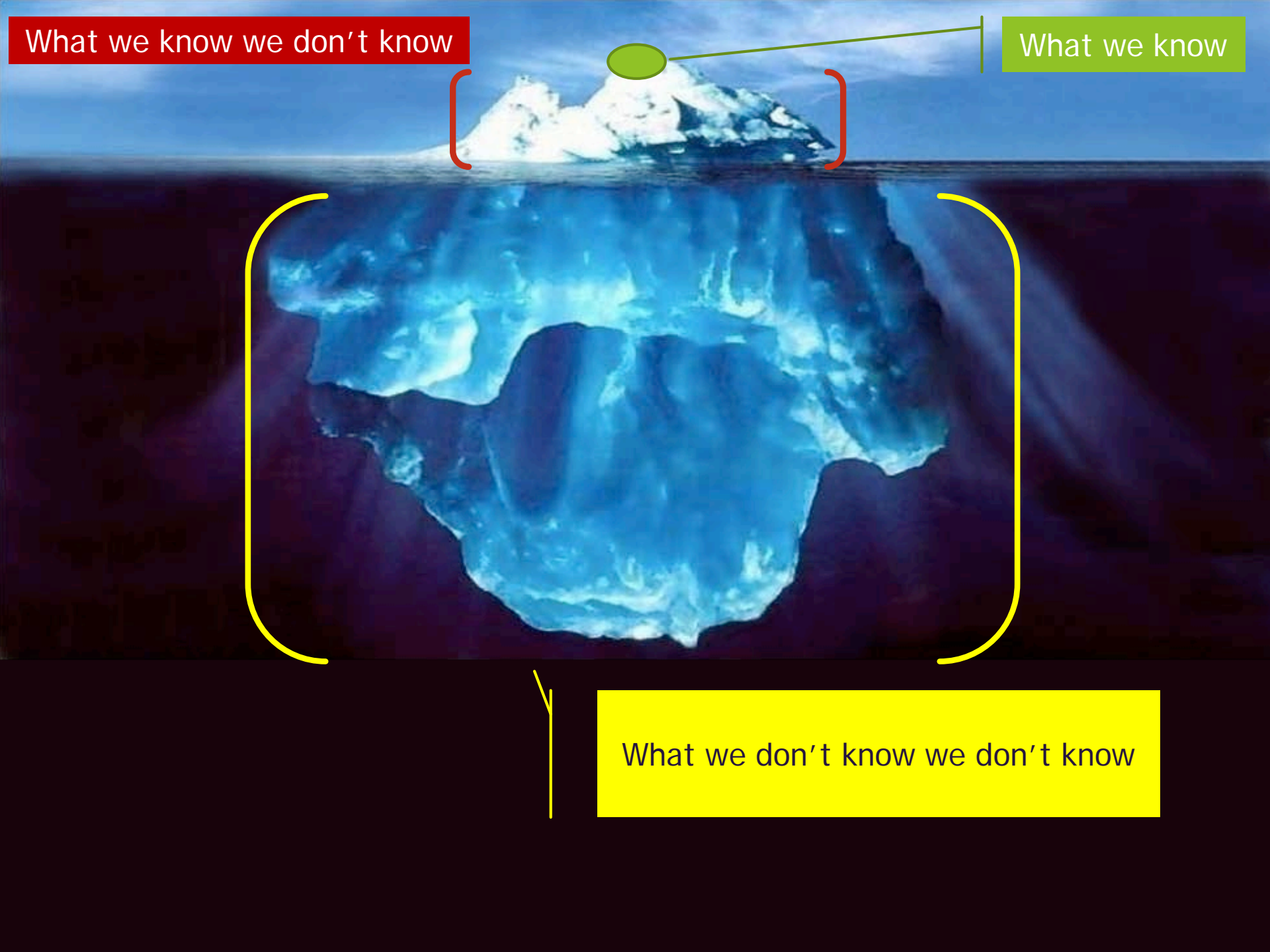
There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

(Donald Rumsfeld)

izquotes.com

What we know we don't know

What we know

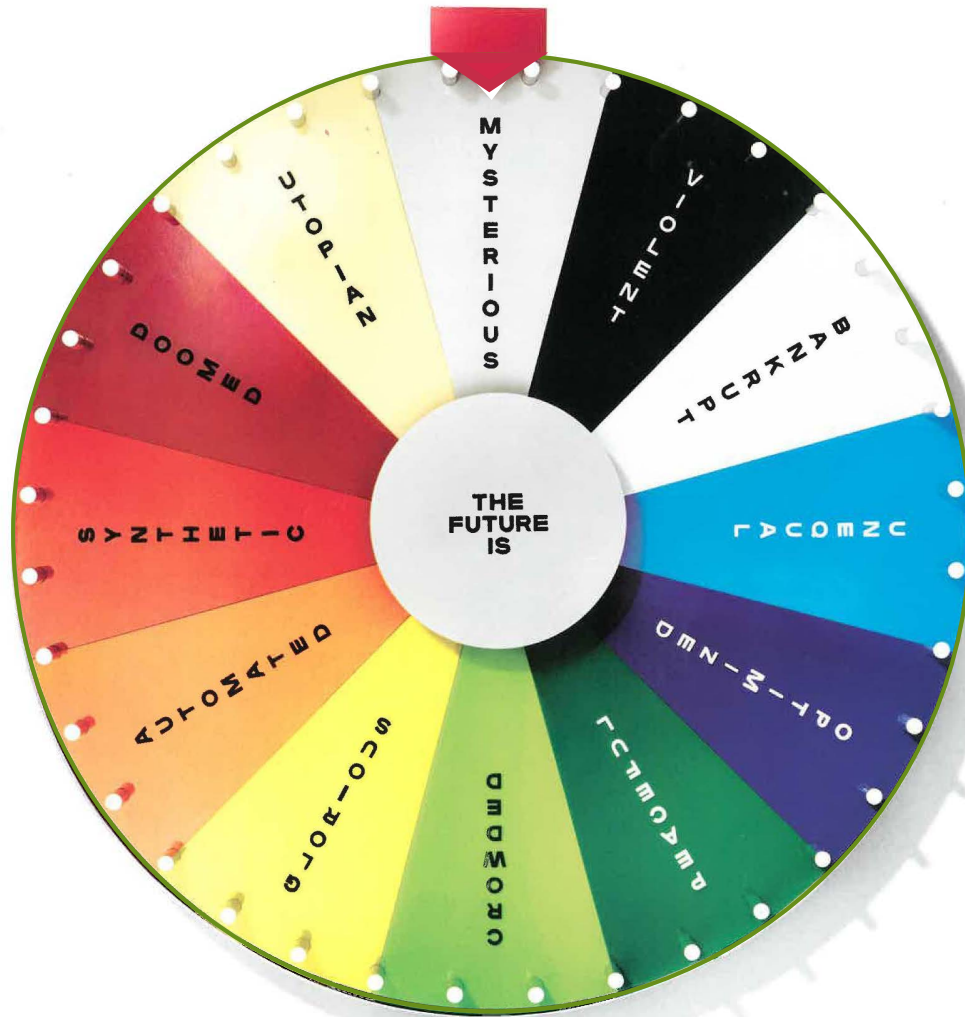


What we don't know we don't know

THE FUTURE ISSUE

The New York Times Magazine

November 15, 2015

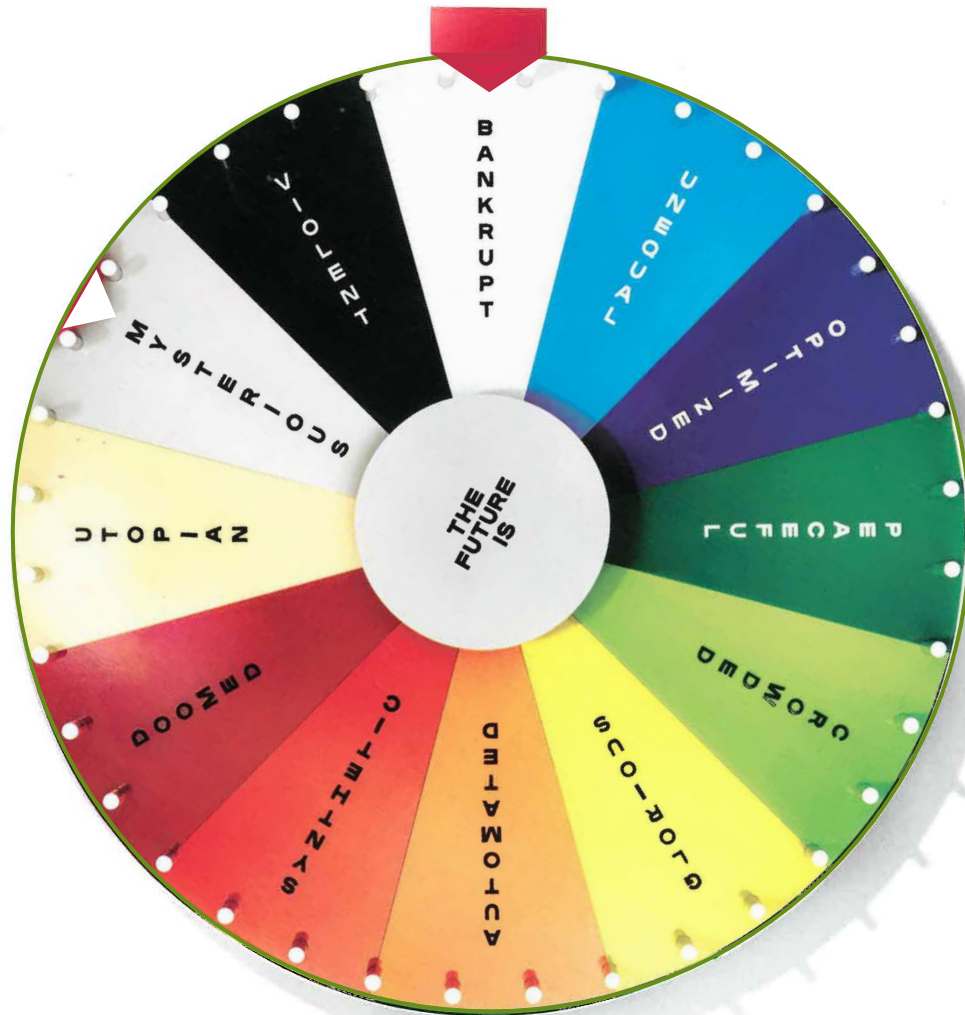


MAKING SENSE OF WHAT WE CANNOT KNOW

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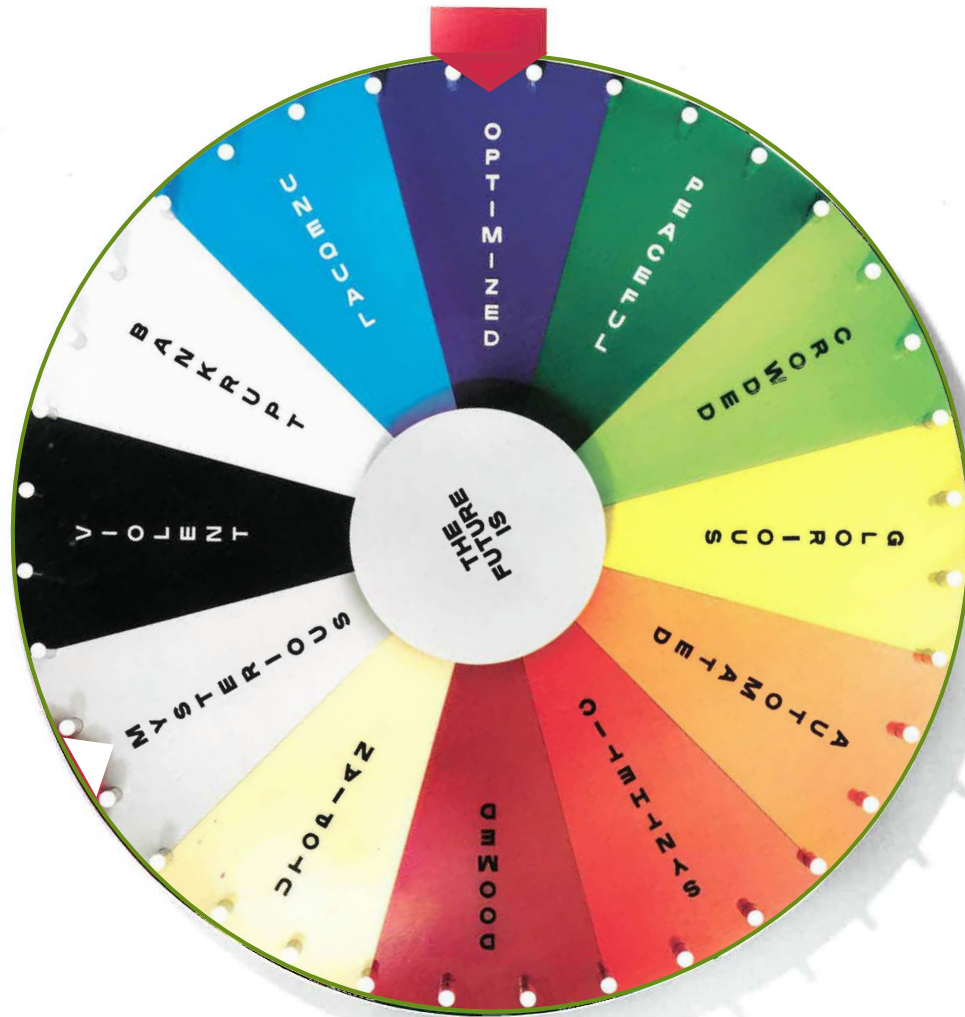


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MAKING SENSE OF WHAT WE CANNOT KNOW

Quick Start Guide to Scenario Planning

1. Clearly articulate the problem you're trying to address
2. Identify driving forces
3. Identify and explore critical uncertainties
4. Develop alternate scenarios based on the top two uncertainties
5. Discuss implications for adopted plans, strategic path

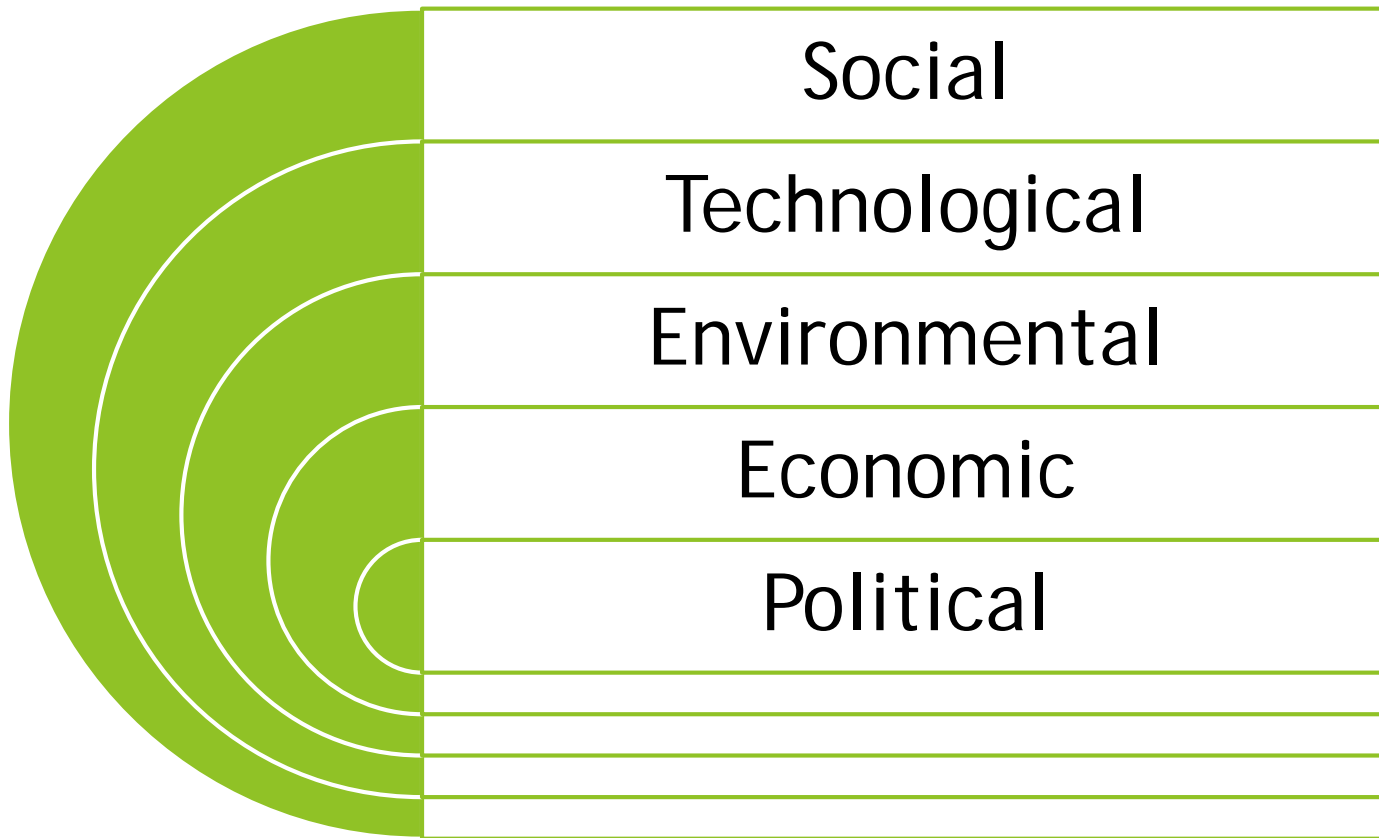
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If it's not a substantive problem
you're trying to resolve - maybe even
a crisis - then you probably don't need
exploratory scenario planning.

Quick Start Guide to Scenario Planning

1. Clearly articulate the problem you're trying to address
- 2. Identify driving forces**
3. Identify and explore critical uncertainties
4. Develop alternate scenarios based on the top two uncertainties
5. Discuss implications for adopted plans, strategic path



Think beyond transportation.

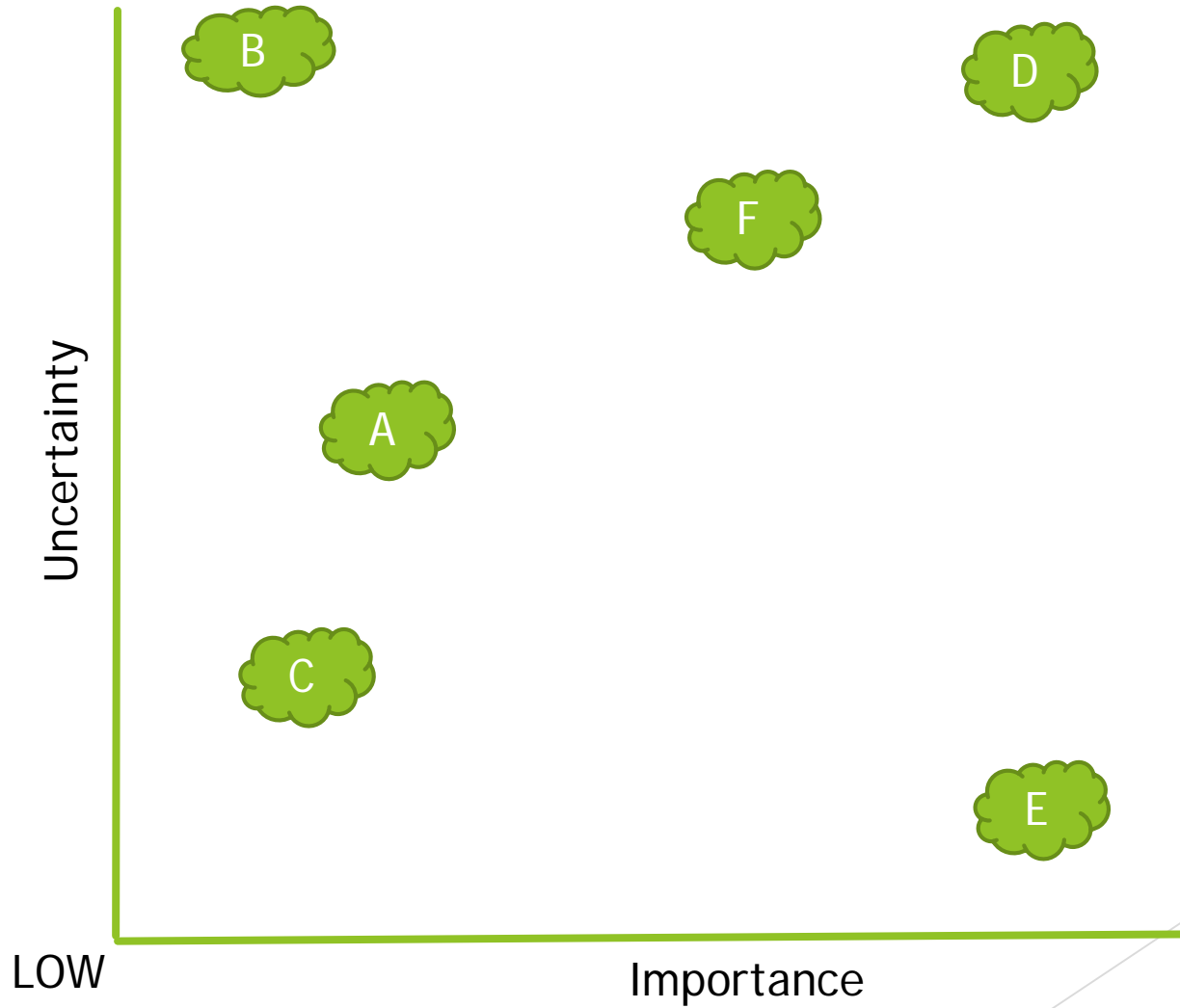
Don't limit your exploration of driving forces to transportation. It's everything *else* you need to be concerned about. Think "megatrends."



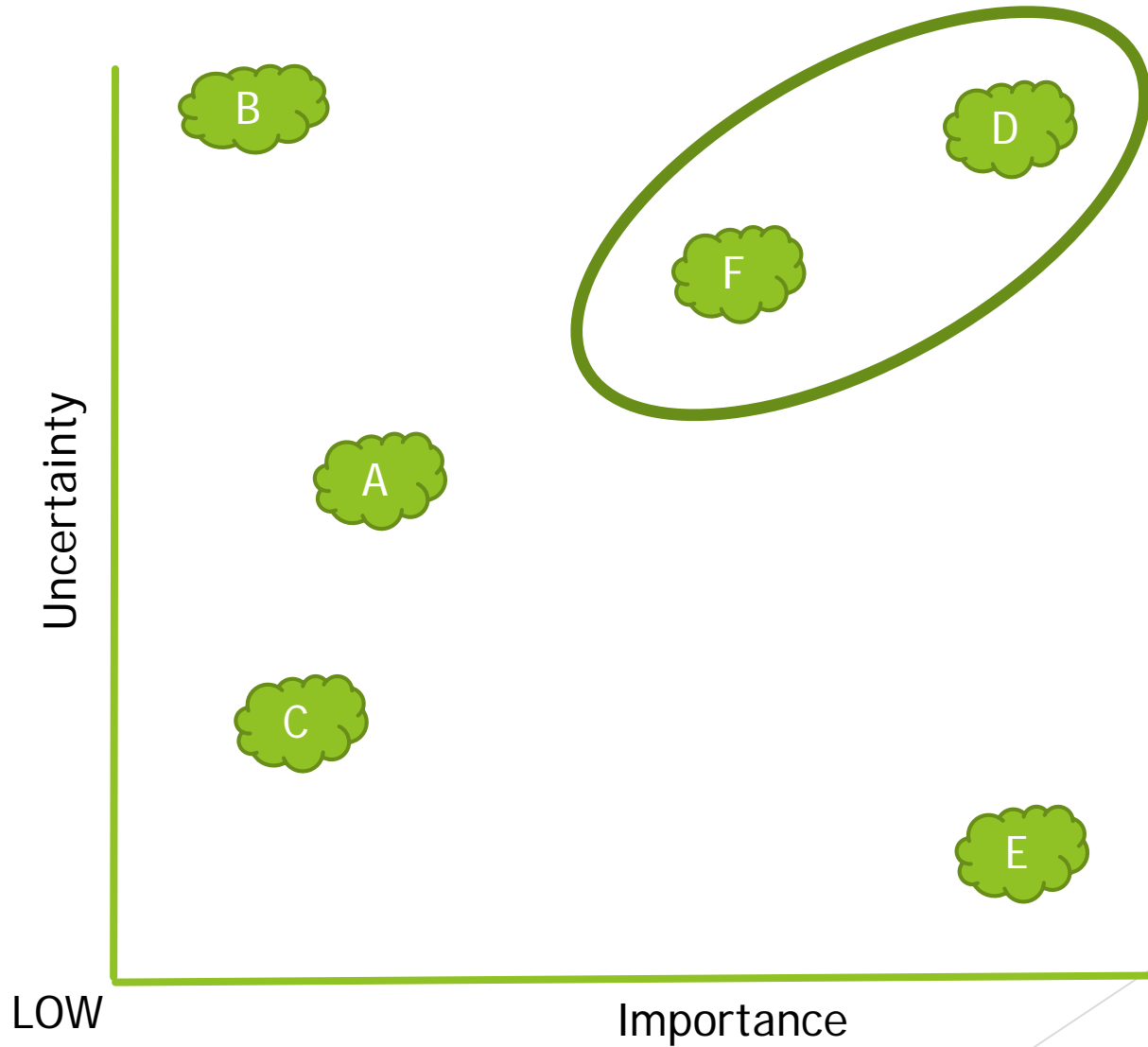
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What are critical uncertainties?

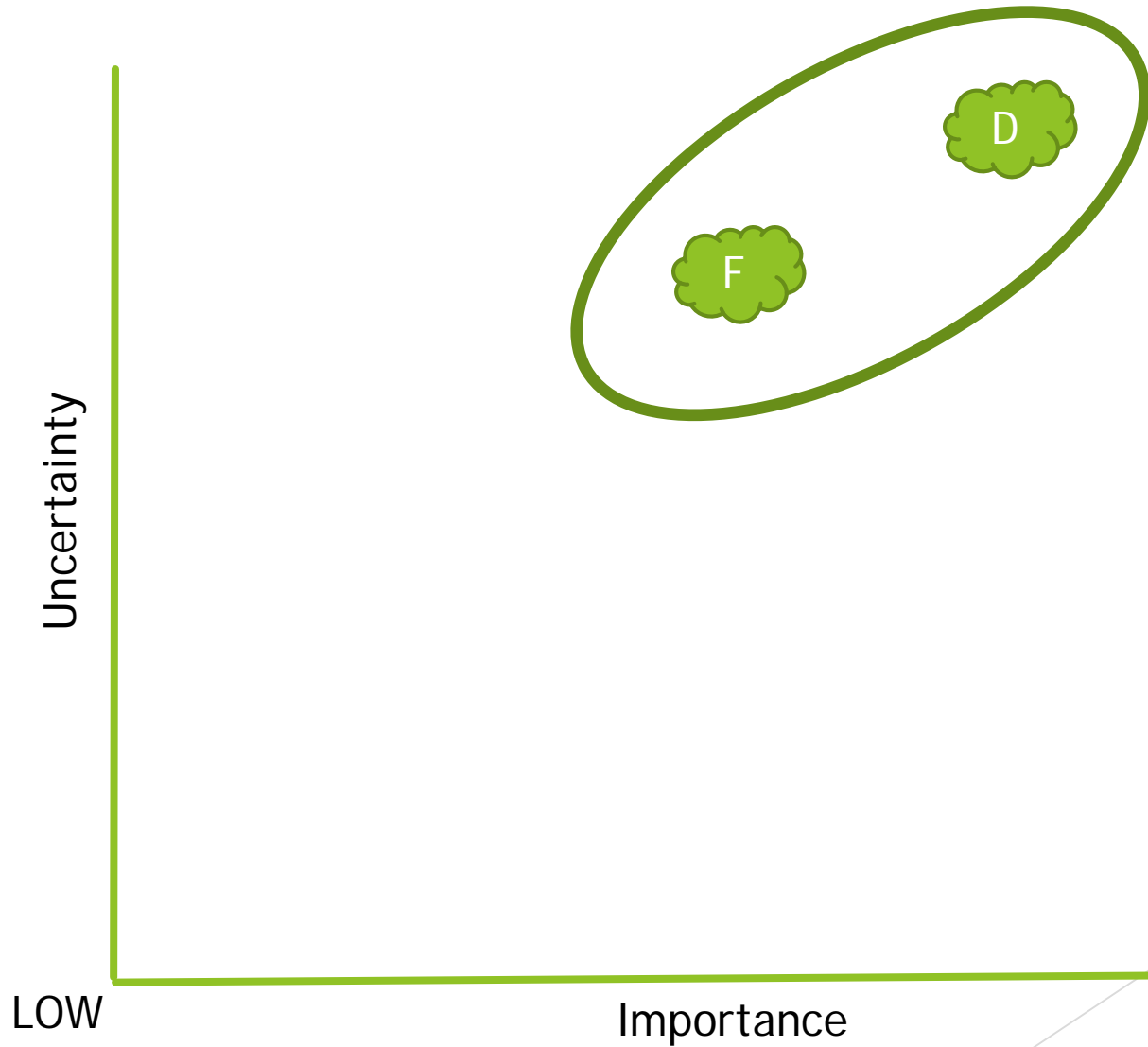


What are critical uncertainties?



High Uncertainty, High Importance

What are critical uncertainties?



High Uncertainty, High Importance

Quick Start Guide to Scenario Planning

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Scenarios are NOT predictions or forecasts.

They are stories about how the future might be.

- Describe a future based on critical factors and driving forces
- Bounded by the most critical uncertainties
- Plausible, consistent, non-judgmental
- Catchy, descriptive scenario names

Quick Start Guide to Scenario Planning

1. Clearly articulate the problem you're trying to address
2. Identify driving forces
3. Identify and explore critical uncertainties
4. Develop alternate scenarios based on the top two uncertainties
5. Discuss implications for adopted plans, strategic path

Evaluate your plan, your project, your investment strategy, in light of these scenarios. What happens to your plan - project - strategy - if one of these futures emerges?

Goal: Make decisions and investments that are robust under a range of plausible future scenarios, not just one idealized scenario.



THE FUTURE
WILL BE
GREAT!

THE FUTURE
WILL BE
AWFUL!

THE FUTURE
DOESN'T CARE
WHAT YOU
THINK.

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #1 for Workshop Exercise:

Federal government's role in transportation and its funding capacity

- A. Increased Role and Additional Funding Capacity
- B. Decreased Role and Reduced Funding Capacity

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #1 for Workshop Exercise:

Federal government's role in transportation and its funding capacity

A. Increased Role and Additional Funding Capacity

B. Decreased Role and Reduced Funding Capacity

Perhaps...

- New revenues are established
- Distributions to states, MPOs, and transit increase significantly
- Strong national direction emerges for core system functions - freight, public transportation, operations, preservation
- Investments are targeted to federal funding priorities
- Consistent standards and system continuity are the norm
- Clarity and predictability encourage more private participation

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #1 for Workshop Exercise:

Federal government's role in transportation and its funding capacity

A. Increased Role and Additional Funding Capacity

B. Decreased Role and Reduced Funding Capacity

Perhaps...

- Reliance on gas tax, reluctance to increase it means revenues deteriorate
- States and regions that can afford to do so raise additional revenues; system deteriorates in those states that cannot afford to raise revenues
- Highly fragmented approach exists to standards, decision-making
- Priorities swing wildly and are easily politicized and over-turned
- Standards vary between regions and states, sometimes year to year
- Great uncertainty and unpredictability reduces viability of P3 projects

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #2 for Workshop Exercise:
US Response to Climate Change

- A. Concurrent adaptation and increased resiliency
- B. Great disruption and mass migrations

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #2 for Workshop Exercise: US Response to Climate Change

- A. Concurrent adaptation and increased resiliency
- B. Great disruption and mass migrations

Perhaps...

- Public pressure forces aggressive Congressional response to GHG
- Demand for urban lifestyles generates high growth in low-carbon travel
- Technological advances offset most disruptive aspects of change
- Economic boom results from technology responses
- New energy sources and pricing mechanisms align with climate goals
- Decreases in arable land in some areas is offset by increase of newly arable lands in other places

Critical Issues: Highly Impactful and Highly Uncertain

Critical Issue #2 for Workshop Exercise: US Response to Climate Change

- A. Concurrent adaptation and increased resiliency
- B. Great disruption and mass migrations

Perhaps...

- Political pressures create stalemate on regulatory measures
- Surges of climate refugees overwhelm housing capacity in receiving areas
- Political instability and lack of research funding stymies tech sector
- Extreme weather disrupts supply chain logistics, weakening economy
- Global instability results in sporadic fuel shortages, volatile pricing
- Massive droughts plague 2/3 of US while sea level rise frequently inundates 600 miles of rail line on the east coast

Critical Issues: Highly Impactful and Highly Uncertain

Federal Transportation Funding Role

Increased Role and Capacity

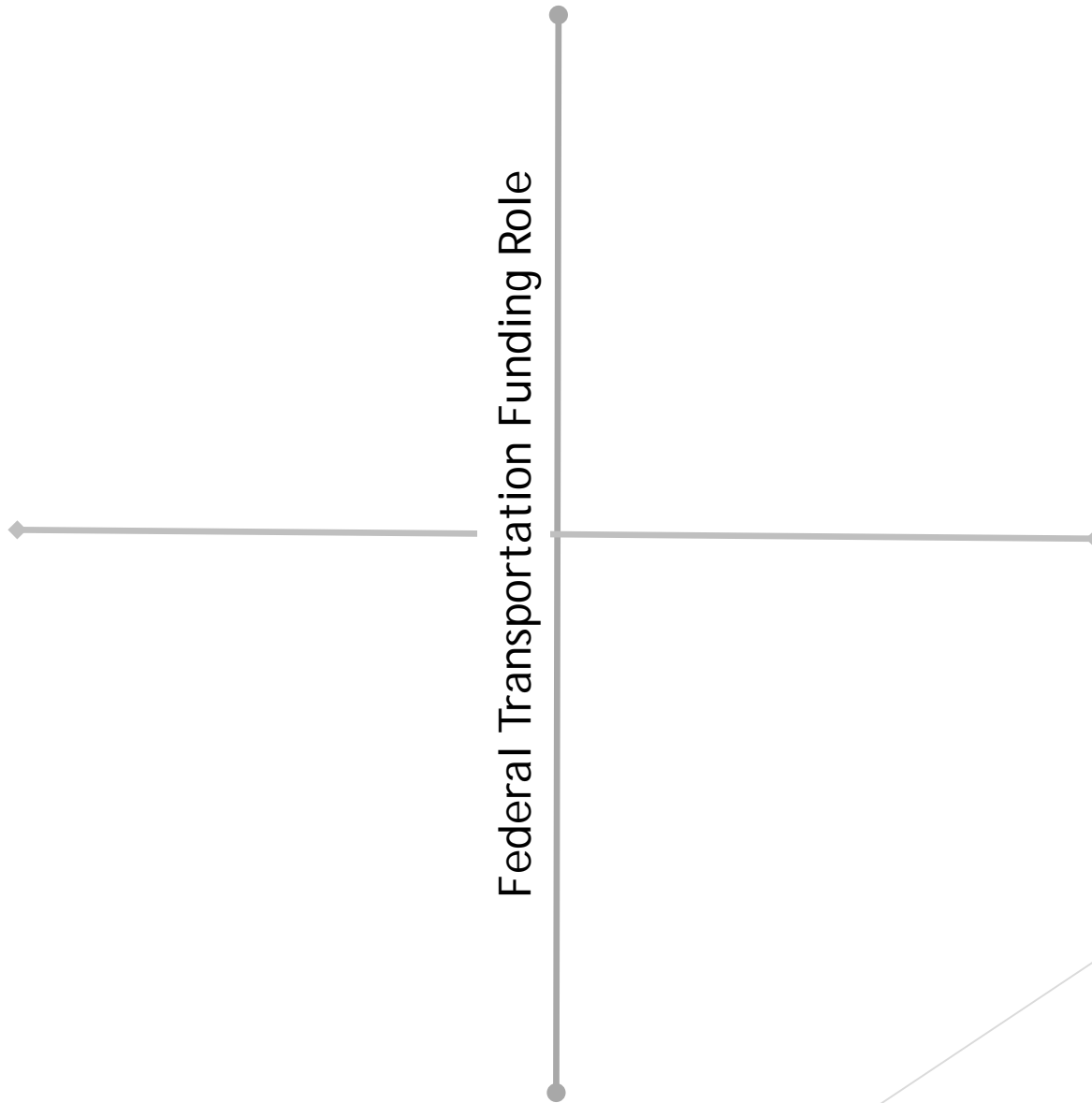
Decreased Role and Capacity

US Response to Climate Change

Adaptation & Increased Resiliency

Disruption & Mass Migration

Increased Role and Capacity



Decreased Role and Capacity

Increased Role and Capacity

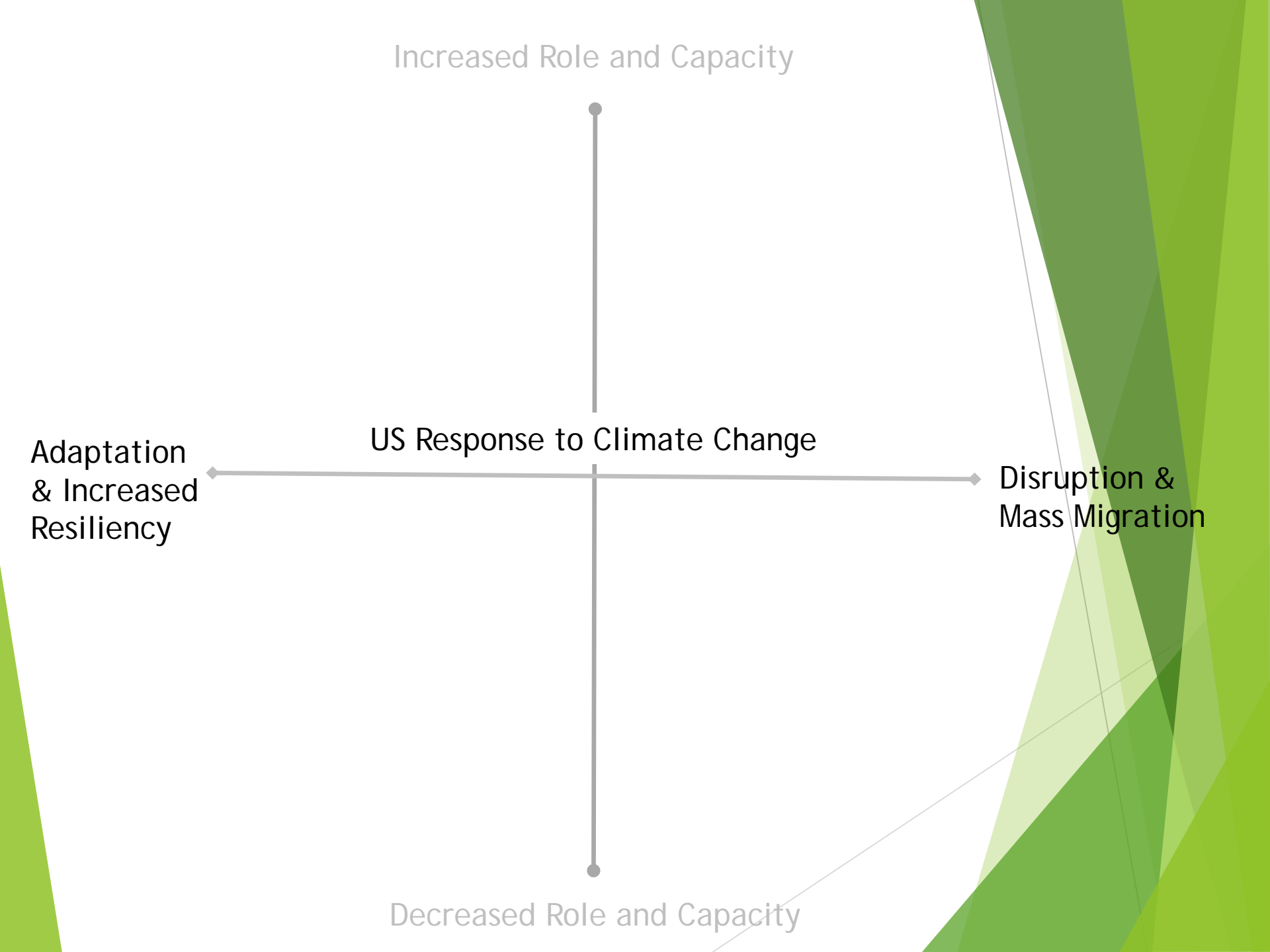


US Response to Climate Change

Adaptation
& Increased
Resiliency

Disruption &
Mass Migration

Decreased Role and Capacity



Increased Role and Capacity

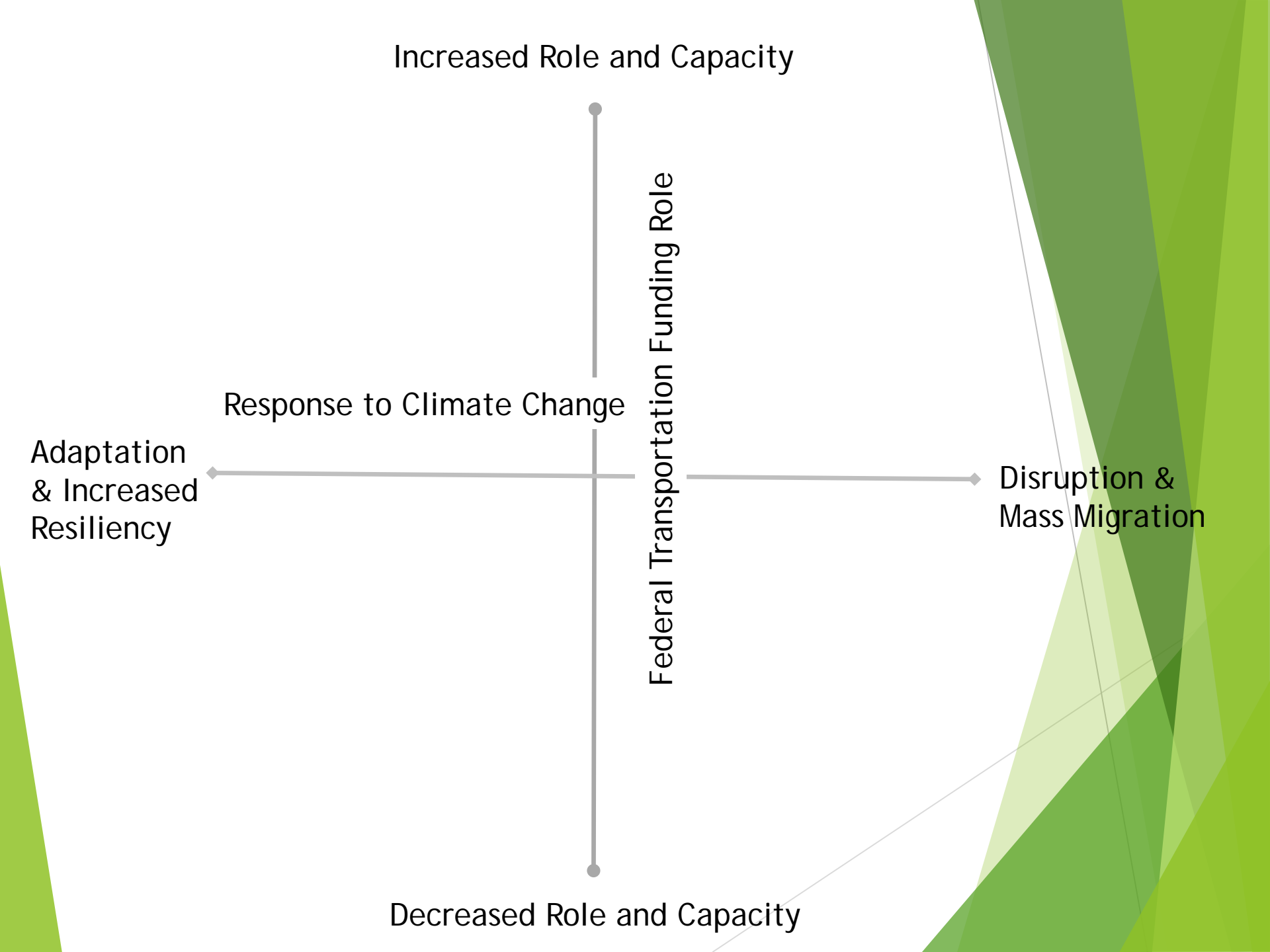
Federal Transportation Funding Role

Response to Climate Change

Adaptation
& Increased
Resiliency

Disruption &
Mass Migration

Decreased Role and Capacity



Info briefs at each table provide data factoids to stimulate your thinking about future uncertainties related to these driving forces.



Hands-On Exploration of Scenario Development:
Data and Insights to Reduce Our Blind Spots

2016 *Use of Scenario Planning in Transportation Planning Conference*

Transportation Investment

Improving the condition and performance of the transportation system will cost



\$120 billion for highways and bridges between 2015 and 2020. Current annual spending at all levels of government —federal, state and local—is just **\$83.1 billion.**



\$43 billion for public transportation. Meanwhile, annual capital spending is just **\$17.1 billion.**

To compete in the global economy, the U.S. needs a world-class transportation system. Some of our most critical transportation infrastructure is crumbling.

65% of U.S. roads are in **less than good condition**



25% of U.S. bridges **need significant repair** or can't handle today's traffic



50% of locks and chambers are **more than 50 years old**



Overall U.S. Infrastructure Grade

D+

Our World Standing

Quality of roads 2008 = 8th

Quality of roads 2014 = 16th

Transportation Spending is in Decline

Our highway and mass transit accounts are trending toward the red. The Federal gas tax is no longer enough to address our transportation needs.

The Federal gas tax has not increased for over 20 years ...



1993 2015
... and the value of the dollar has declined.

Transportation Trust Fund projected annual shortfall



Transit Highway

Oregon Pilots Road User Charges

Oregon is one of many States seeking new revenues to make up for transportation budget shortfalls.



During a recent pilot program in Oregon, participants paid **1.56 cents per mile driven** rather than a state tax of **30 cents per gallon of gasoline.**

1.56¢



Over the next decade higher fuel economy standards will result in more than **\$50 billion** in lost gas tax revenues.

Social

- Refugees on the move increase from 60 million in 2016 to 250 million by 2020
- Millennial demand for urban lifestyles drives increase in transit, bike, and walk

Technological

- Robotics and Artificial Intelligence reduce need to outsource work overseas
- Connectivity and the Internet of Things redefine system performance metrics

Economic

- Housing bubble and collapse of housing market reveal chronic bank instability
- Smart Cities initiatives bolster productivity of sharing economy

Environmental

- Rising seas regularly inundate 600 miles of rail track on the East Coast
- Solar roads generate clean energy for transport and other uses, increase safety

Political

- Political instability and polarization disrupt international agreements, banks
- Public opinion forces Congress to aggressively reduce greenhouse gas emissions

What if...?

EXERCISE OUTLINE

1. Discuss the scenario framework created by the two critical issues
2. Develop four scenarios, one for each square
 - a. Plausible
 - b. Consistent
 - c. Non-judgmental
 - d. Human element
3. Give your scenarios descriptive names or slogans
4. How would your own plan or investment strategies fare in any of these futures? *We're striving to make plans and investments that are resilient under a variety of futures, not just one idealized future. What are your critical uncertainties?*

