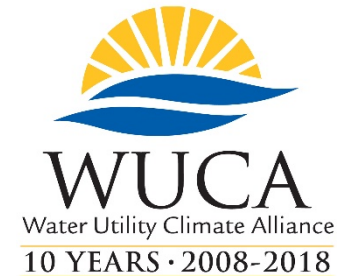


**Building Resilience to a Changing Climate:  
A Technical Training in Water Sector  
Utility Decision Support**



# **Scenario Design: An Accelerated Introduction to Scenario Planning**

Laurna Kaatz, Denver Water, Water Utility Climate Alliance

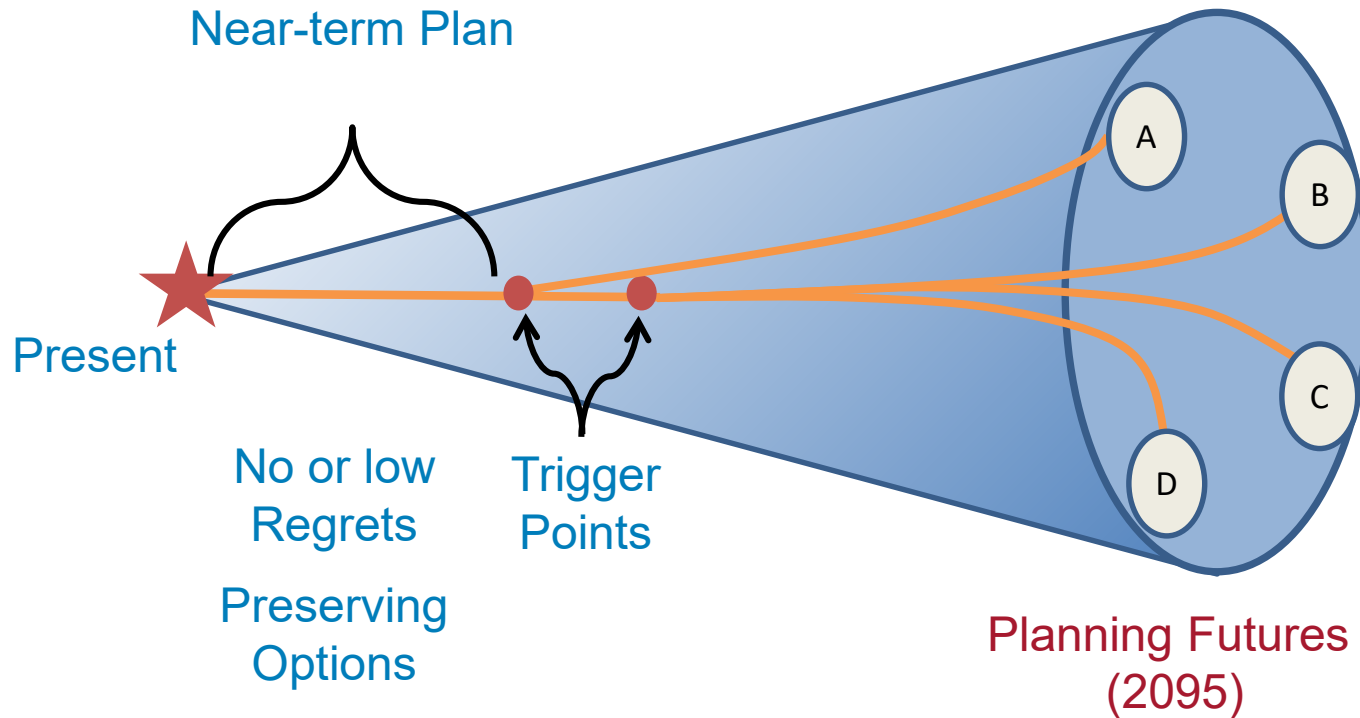


# Scenario Planning

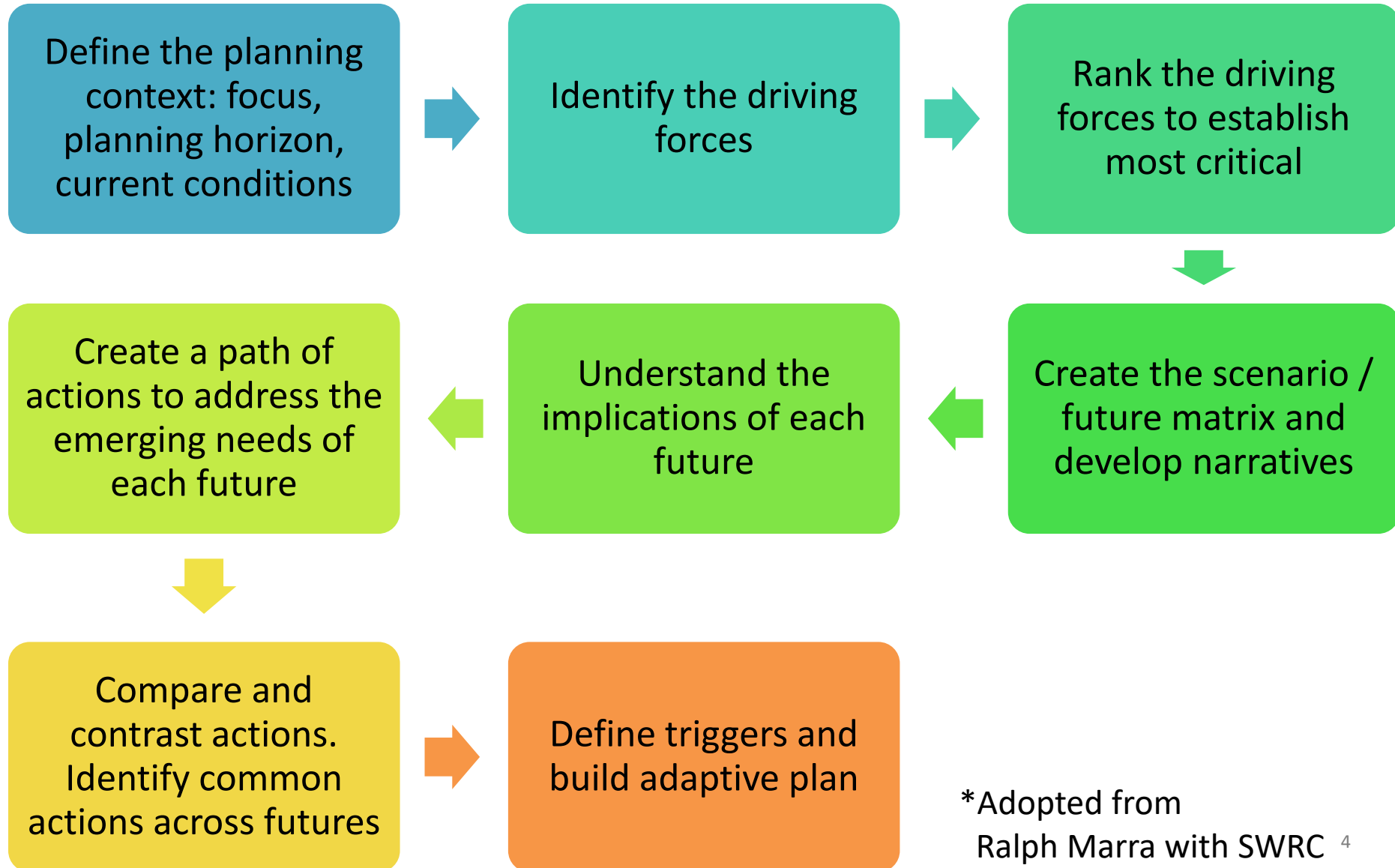
- Scenario Planning IS about being prepared for whatever happens in the future
- Scenario Planning is NOT about envisioning what we want to happen in the future or predicting what will happen in the future

# Scenario Planning

## Cone of Uncertainty



# Scenario Planning Process\*



\*Adopted from  
Ralph Marra with SWRC <sup>4</sup>

# Southwestern Water

**Southwestern Water** is a

- Mid to large water utility
- Provides drinking water, wastewater, and stormwater services
- Located in the southwest, semi-arid region
- Surface and ground water supplies
- One of the fastest growing communities in the southwest



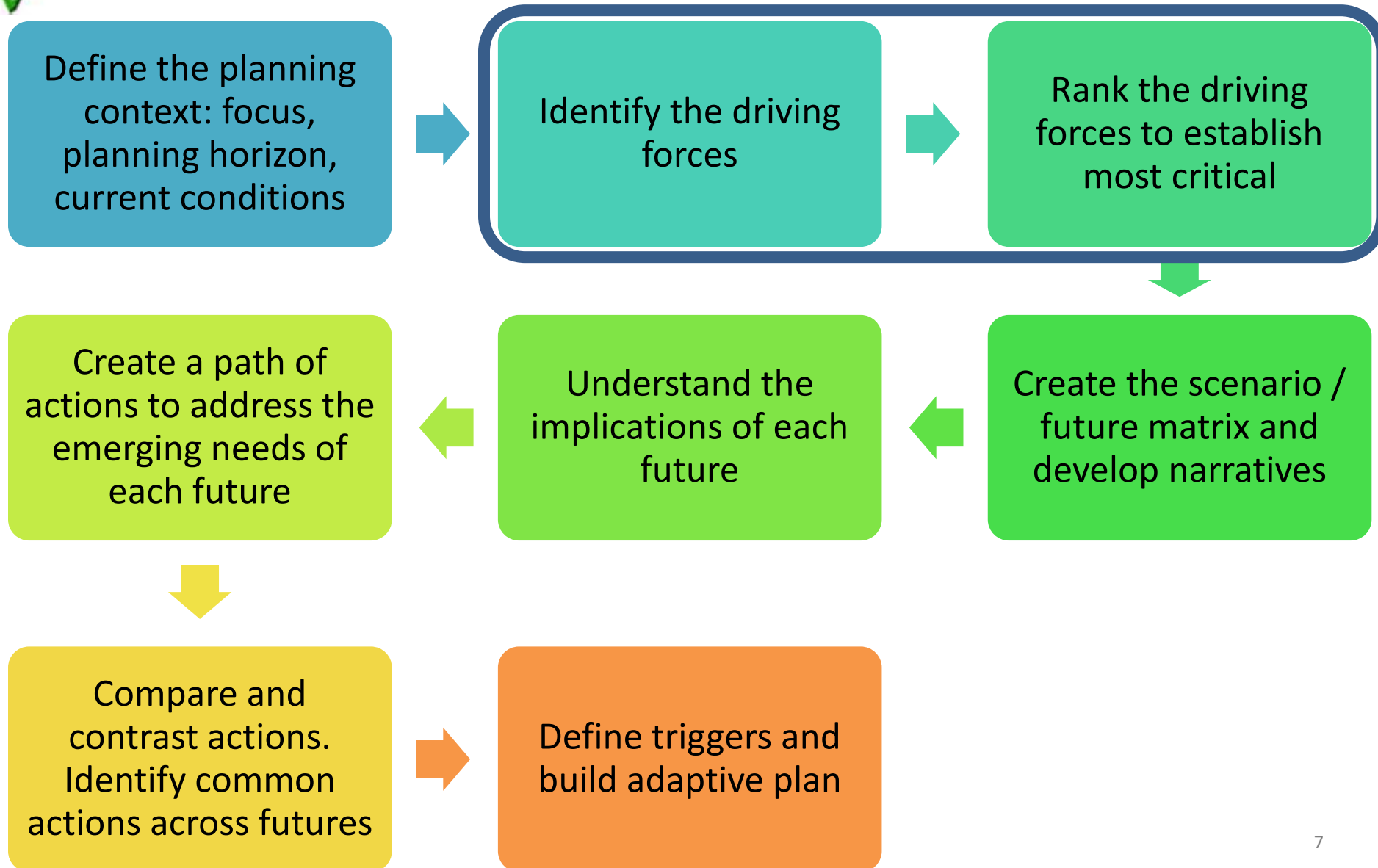
# Southwestern Water

## Southwestern Water is a

- Mid to large water utility
- Provides drinking water, wastewater, and stormwater services
- Located in the southwest, semi-arid region
- Surface and ground water supplies
- One of the fastest growing communities in the southwest

**Focal Question:** How can Southwestern Water best prepare its water system and enhance its resources to meet customer water needs as future challenges and opportunities arise over the next 75 years?

# Scenario Planning Process



# Drivers of Change

- External factors that will influence the context of Southwestern Water's future
- Things outside of SWW's control
- Long-term challenges



# Drivers of Change

- External factors that will influence the context of Southwestern Water's future
- Things outside of SWW's control
- Long-term challenges

## Two minute Brainstorm:

As a Water Manager for SWW, what keeps you up at night?

# Exercise

## **Step 1: Brainstorm Drivers of Change (table) – 20 minutes**

What are the most critical issues that could impact Southwestern Water's ability to meet long-term water needs?

## **Step 2: Select the top 3 most critical drivers (dots) – 15 minutes**

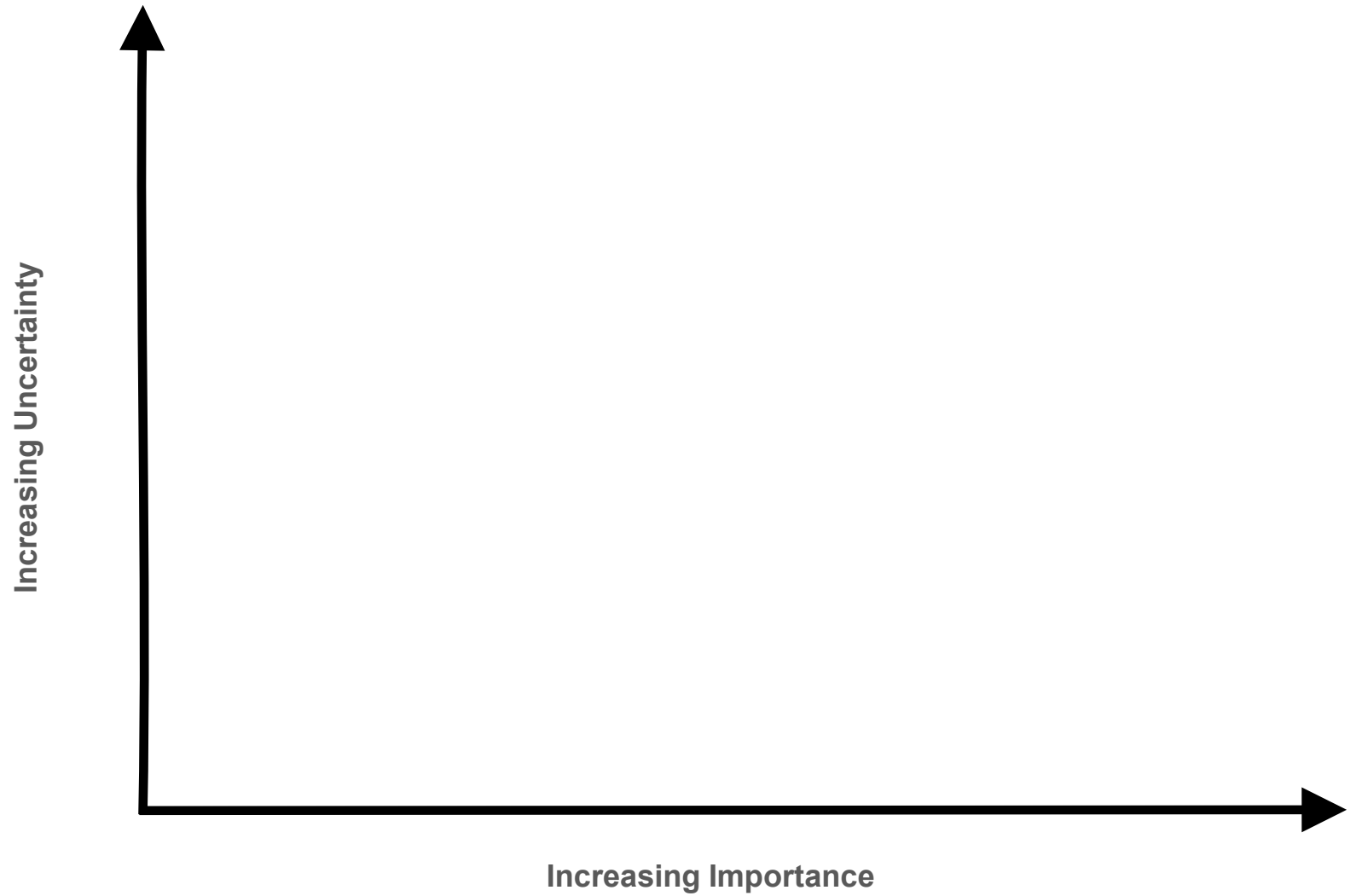
What are the most critical drivers to meeting the focal question?

## **Step 3: Rank the top 10 (graph) – 15 minutes**

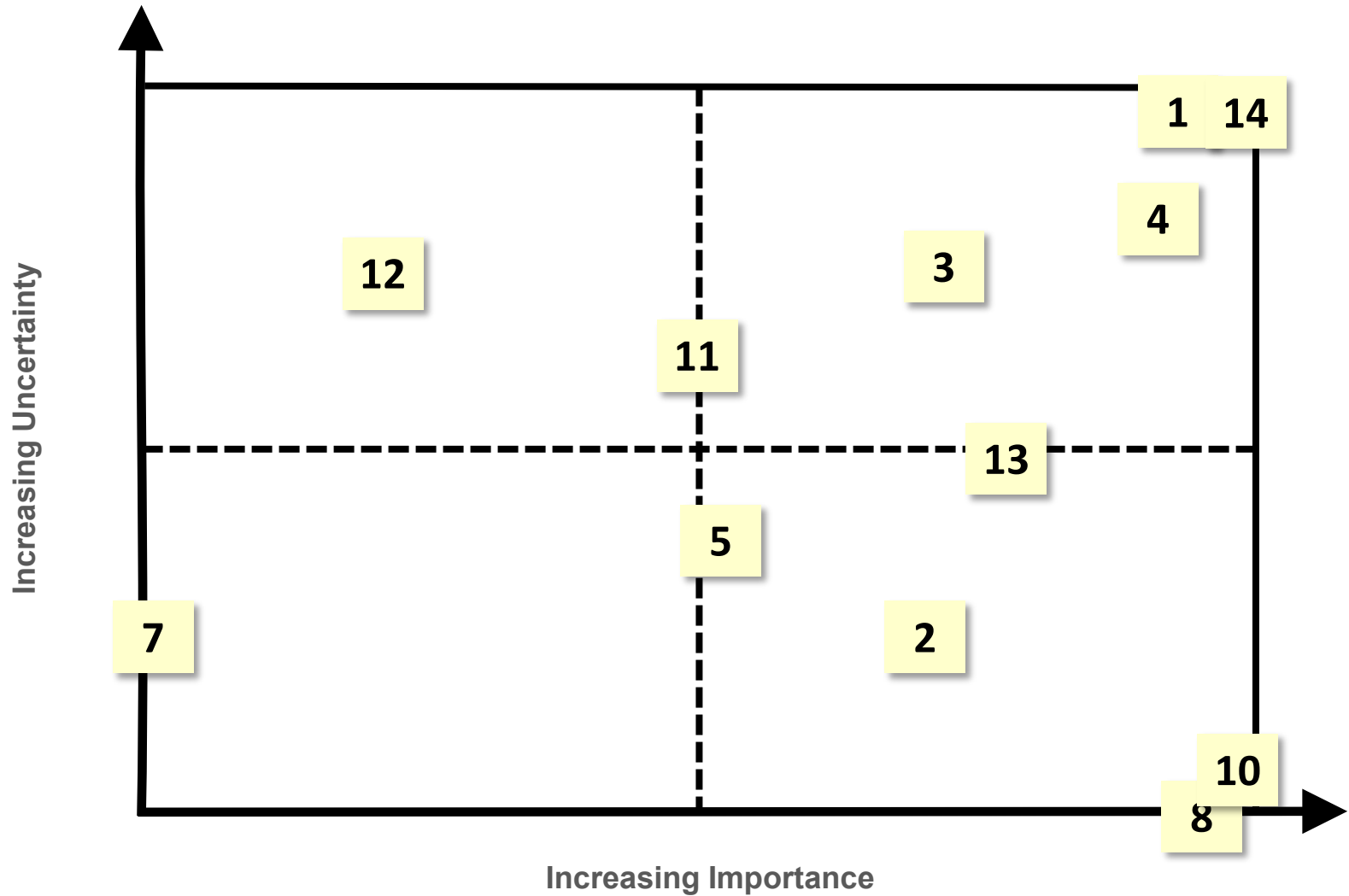
How 'important' is the driver to the focal question?  
How 'uncertain' is the driver?



# Ranking the Drivers



# Ranking the Drivers



# Exercise

## Step 1: Brainstorm Drivers of Change (table) – 20 minutes

What are the most critical issues that could impact Southwestern Water's ability to meet long-term water needs?

## Step 2: Select the top 3 most critical drivers (dots) – 15 minutes

What are the most critical drivers to meeting the focal question?

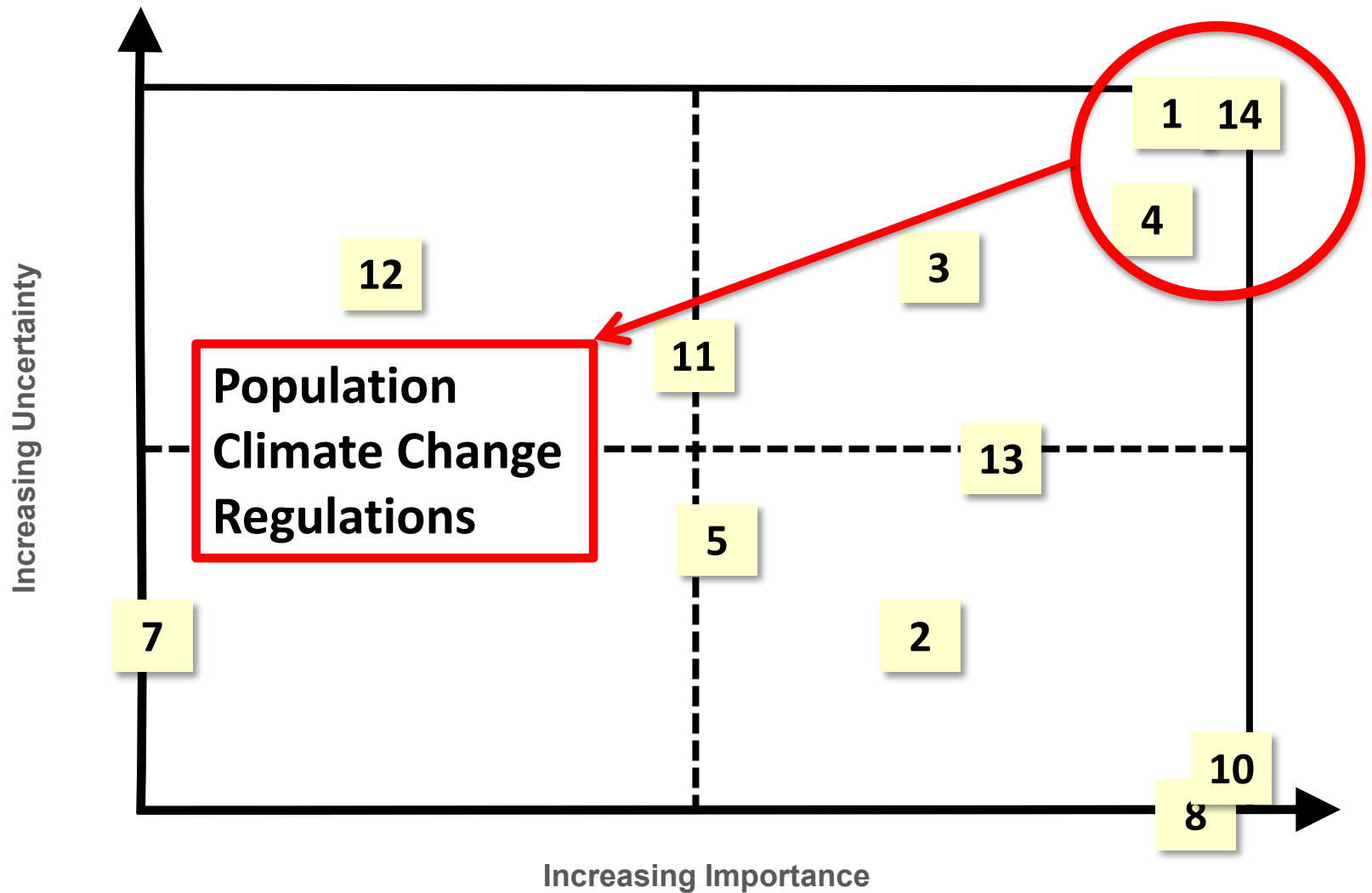
## Step 3: Rank the top 10 (graph) – 15 minutes

How 'important' is the driver?  
How 'uncertain' is the driver?

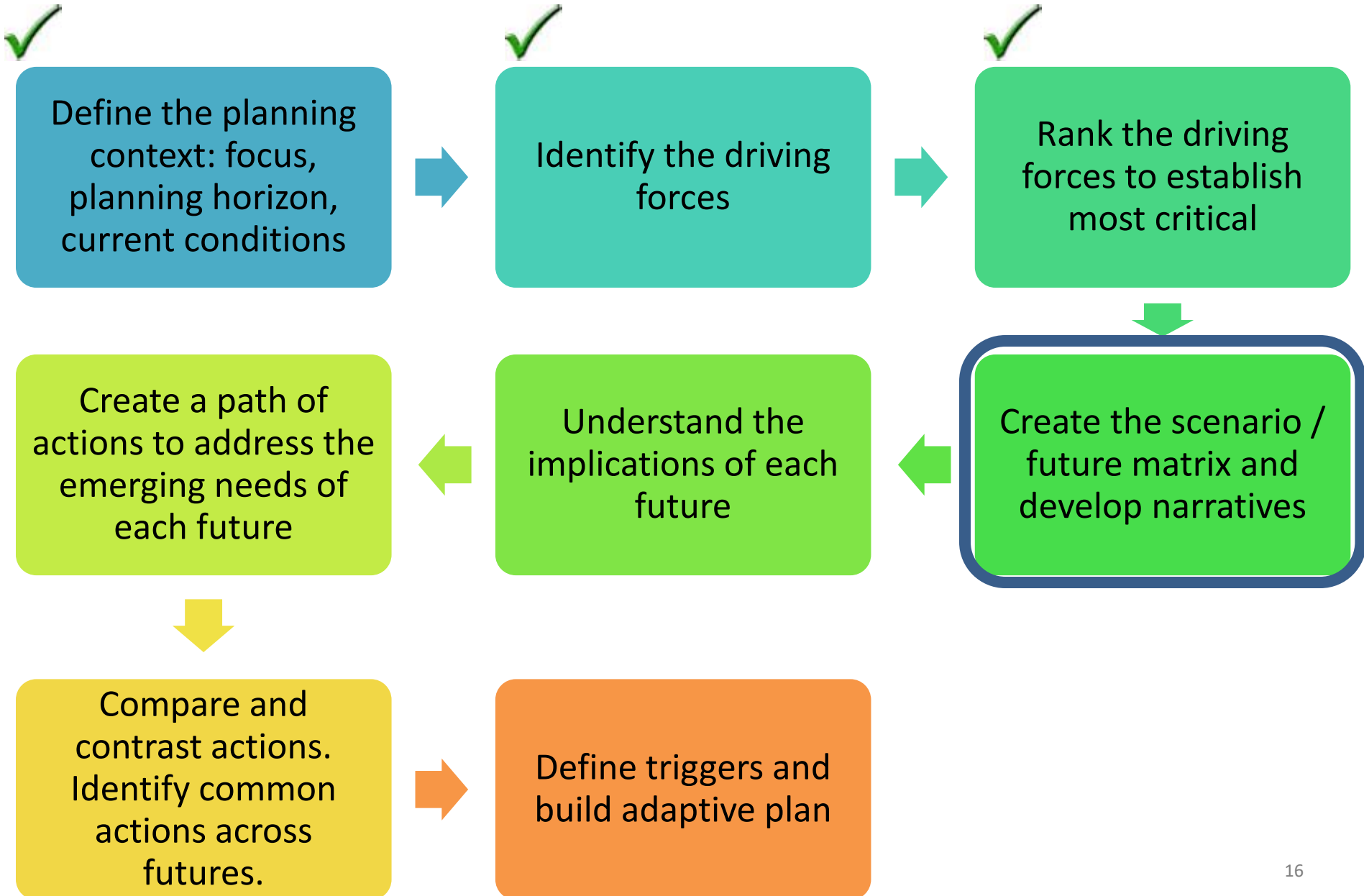
### External Drivers of Change

- External factors that will influence the context of the future
- Things outside of control
- Long-term challenges

# Example: Ranking the Drivers



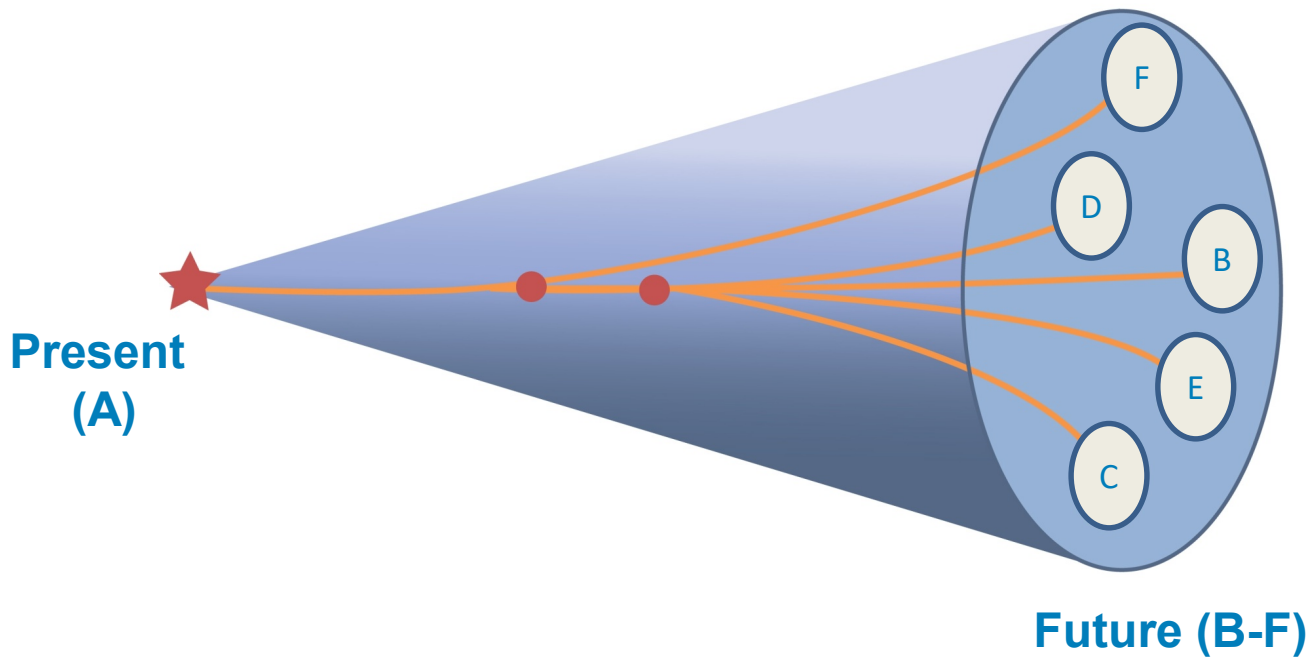
# Scenario Planning Process





# Individual Drivers of Change

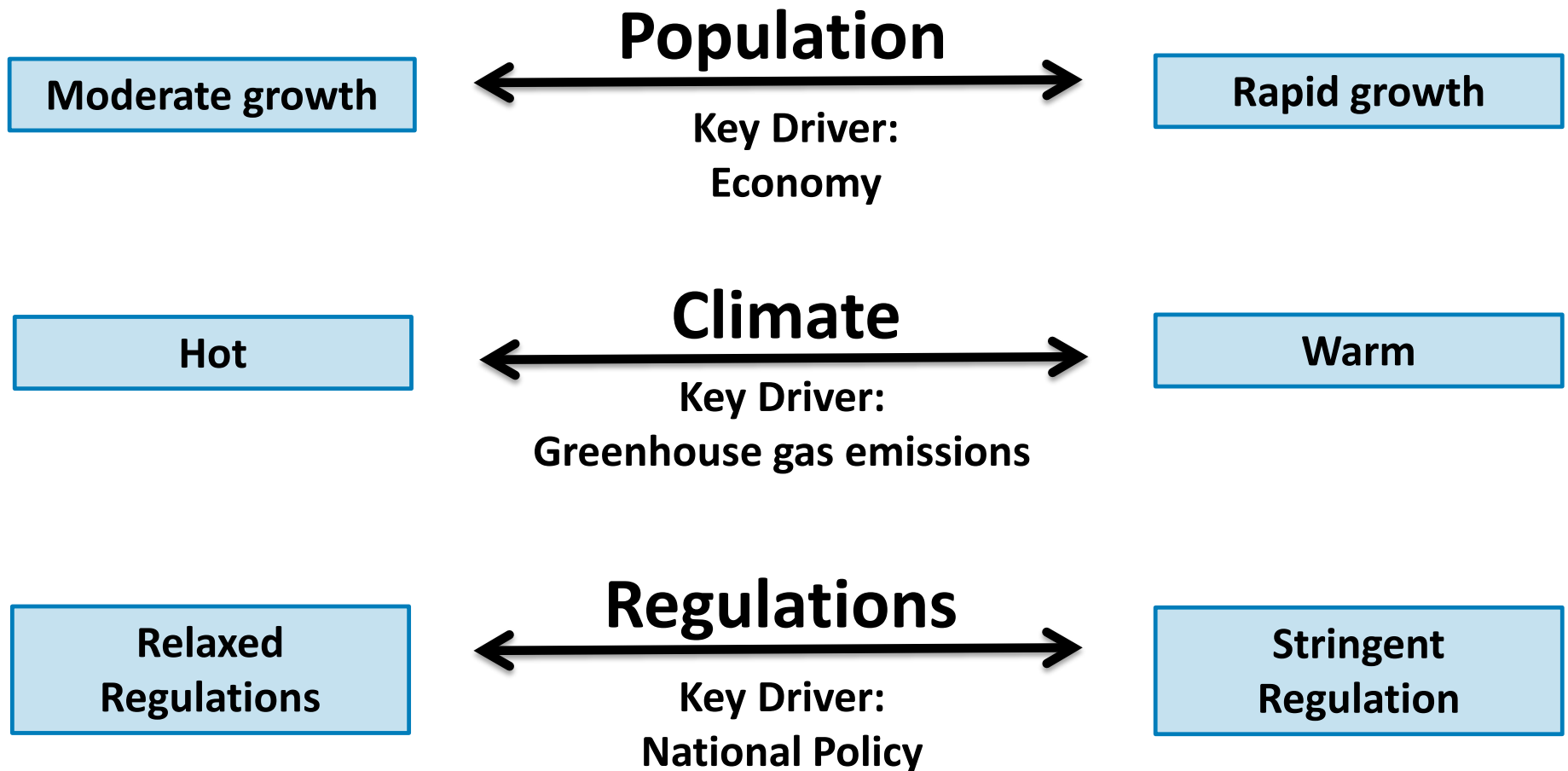
## The Cone of Uncertainty

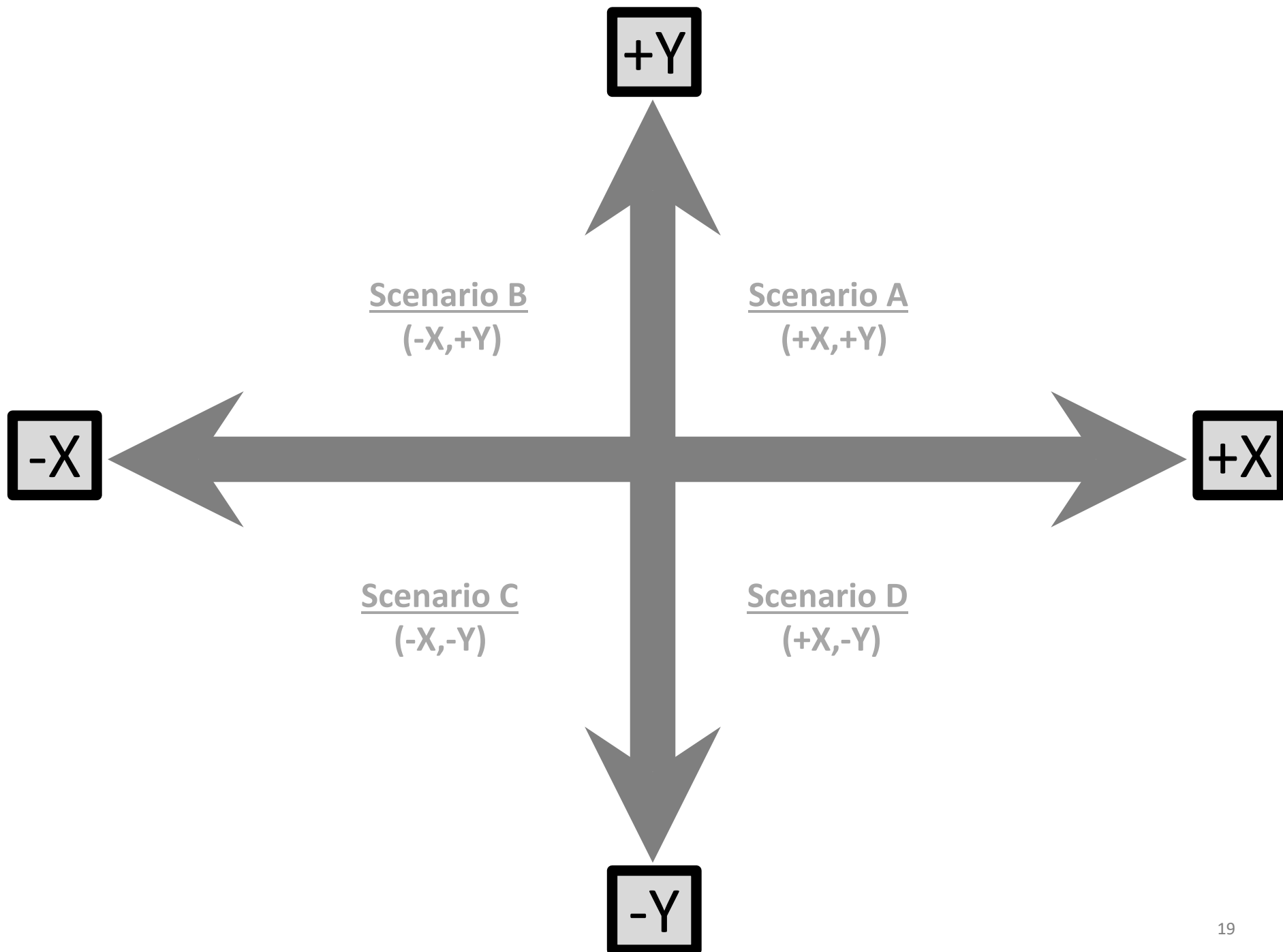


- Traditional Future
- Water Quality Rules
- Hot Water
- Economic Woes
- Green Revolution

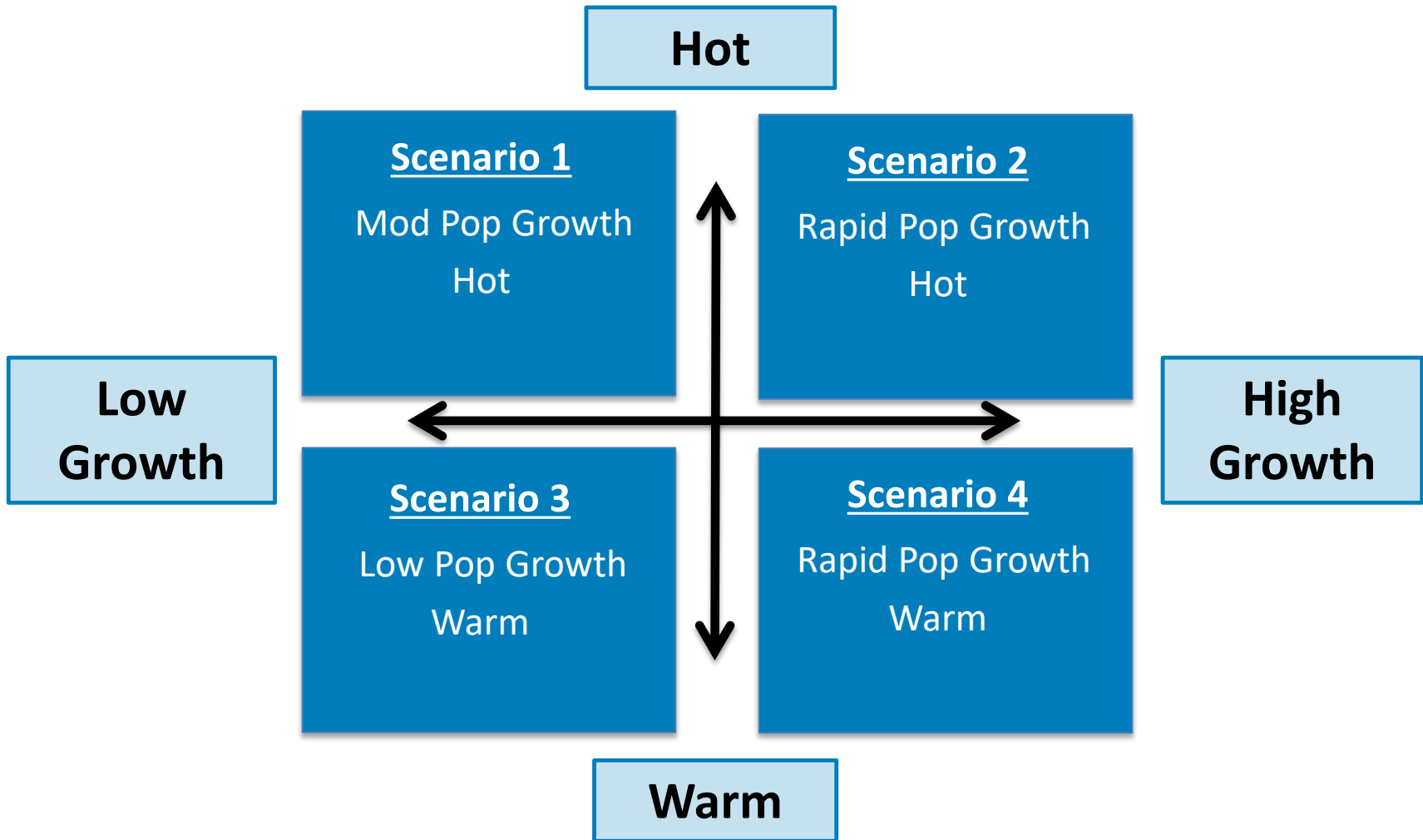
# Combined Drivers of Change

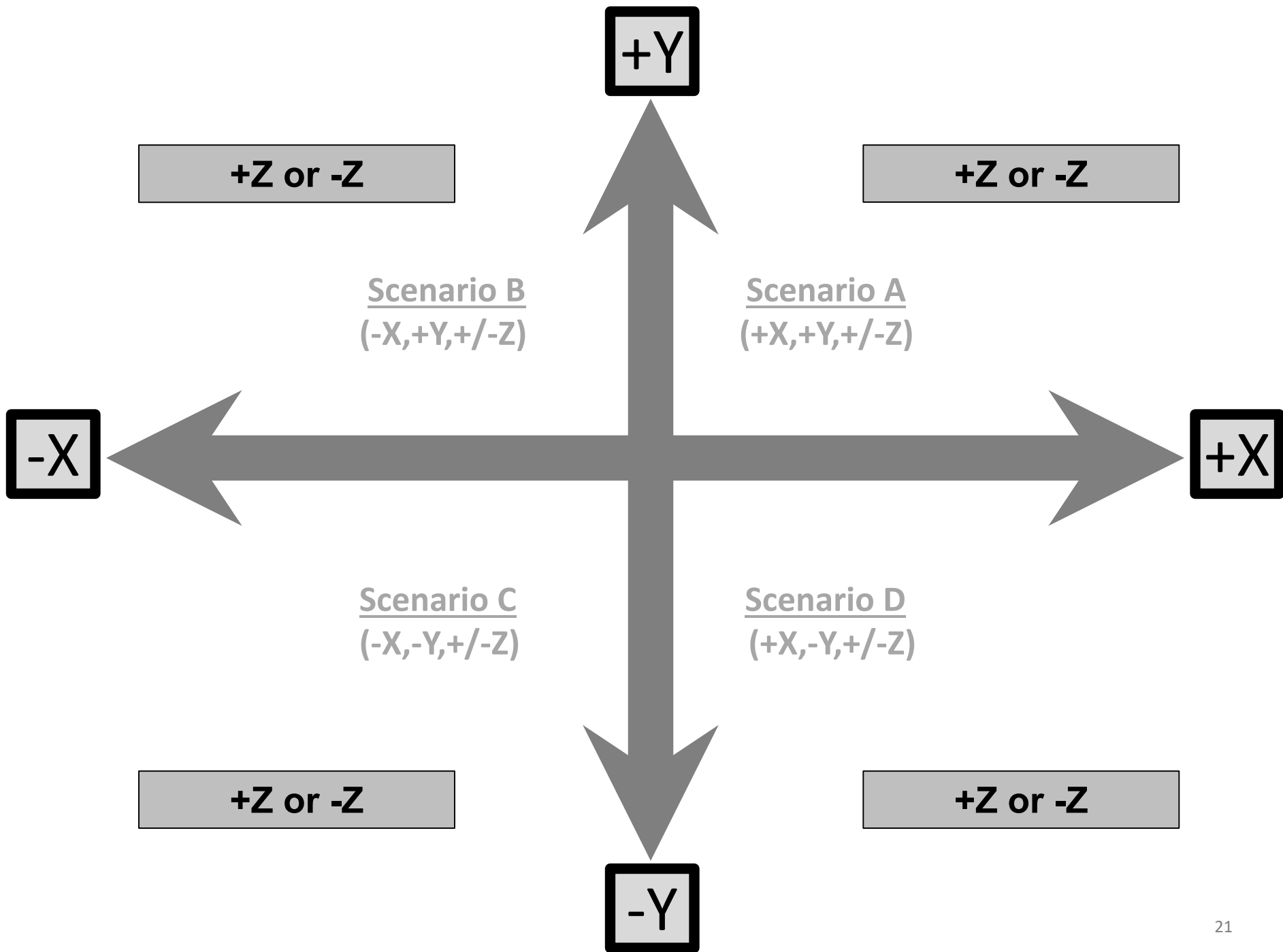
Example: Range of Drivers



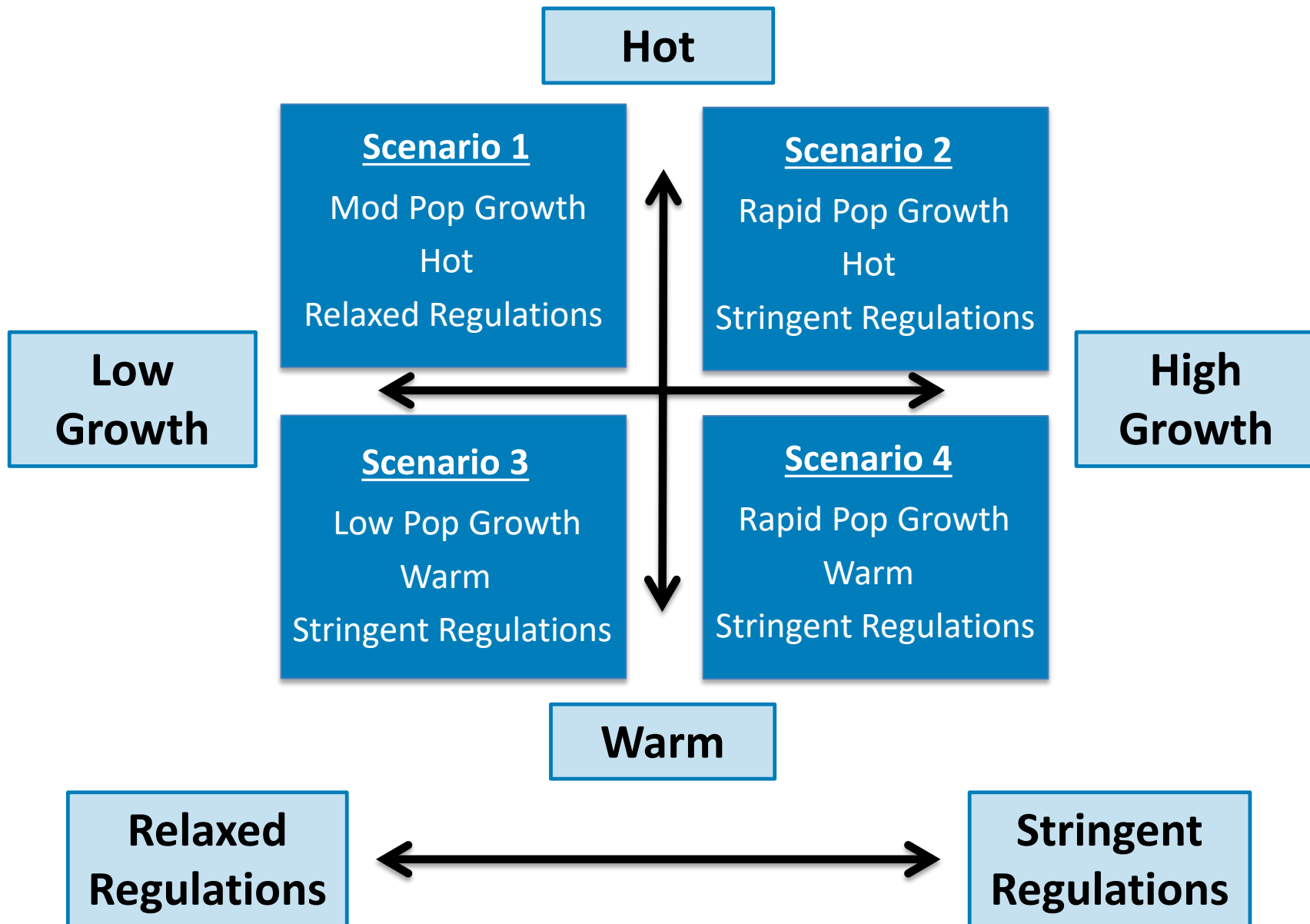


# Example: Four Scenarios

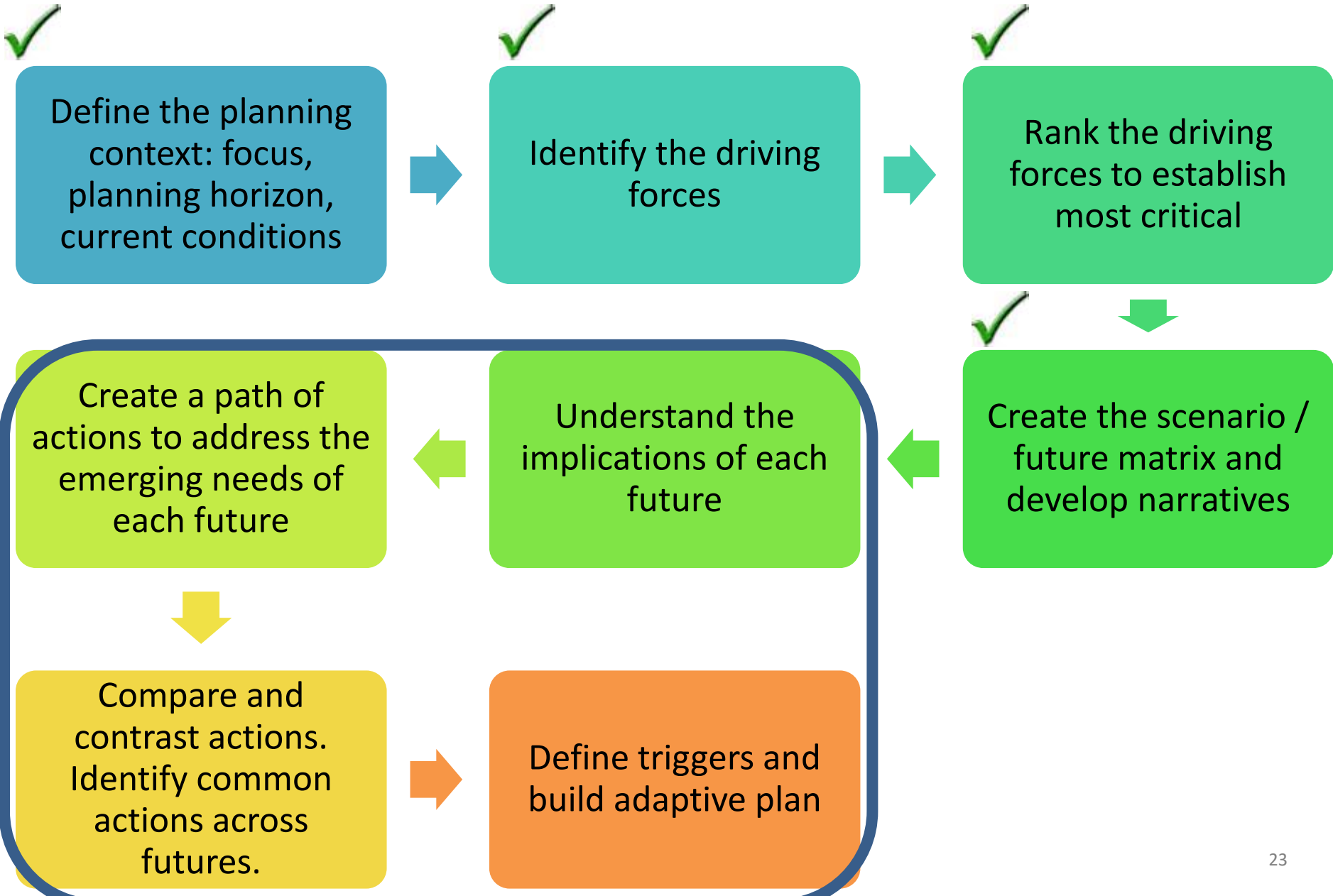




# Example: Four Scenarios

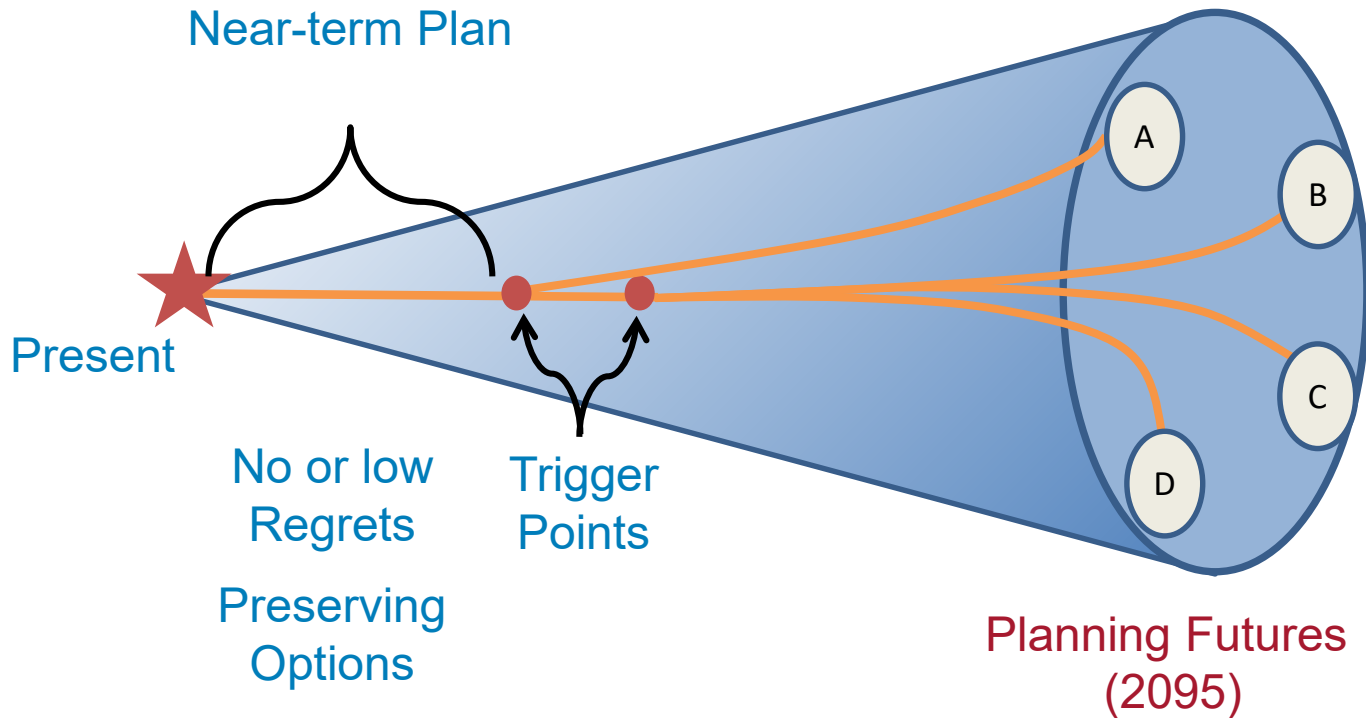


# Scenario Planning Process



# Scenario Planning

## Cone of Uncertainty





# Personal Insights

1. No one-size-fits all approach
2. Pick the parts and pieces that work for you
3. Goal is adaptive planning

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

- Dwight D. Eisenhower

# WUCA White Papers

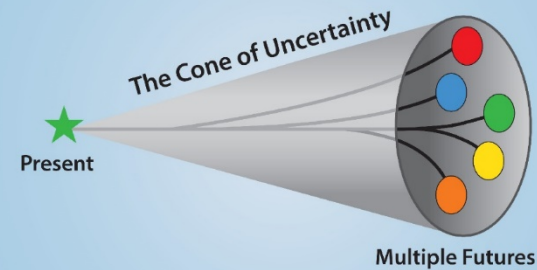
## DECISION SUPPORT PLANNING METHODS: INCORPORATING CLIMATE CHANGE UNCERTAINTIES INTO WATER PLANNING



JANUARY 2010

## EMBRACING UNCERTAINTY

A Case Study Examination of How Climate Change  
is Shifting Water Utility Planning



Prepared for:

Water Utility Climate Alliance (WUCA)  
American Water Works Association (AWWA)  
Water Research Foundation (WRF)  
Association of Metropolitan Water Agencies (AMWA)

Project Manager: Lurna Kaatz, Denver Water



# Society for Decision Making under Deep Uncertainty

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Learn more: [www.deepuncertainty.org](http://www.deepuncertainty.org)

The Society is a multi-disciplinary association of professionals working to improve methods and tools in this field, facilitate their use in practice, and ultimately encourage sound decision making in our rapidly changing world.