

Scenario Planning

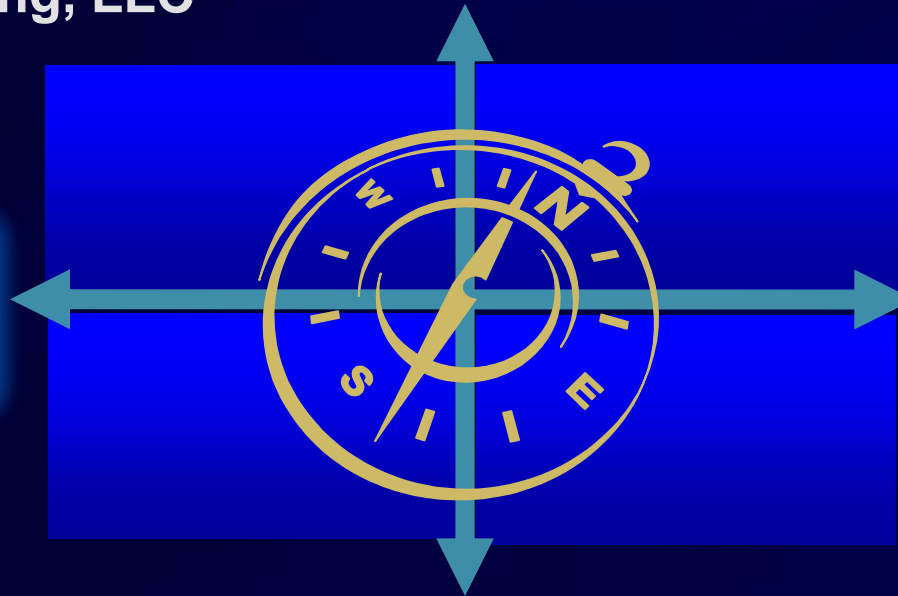
An Approach to Managing Uncertainty

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Southwest Colorado Council of Governments
Board of Directors Meeting
February 6, 2015

“Western Lands and Communities” Exploratory Scenario Planning

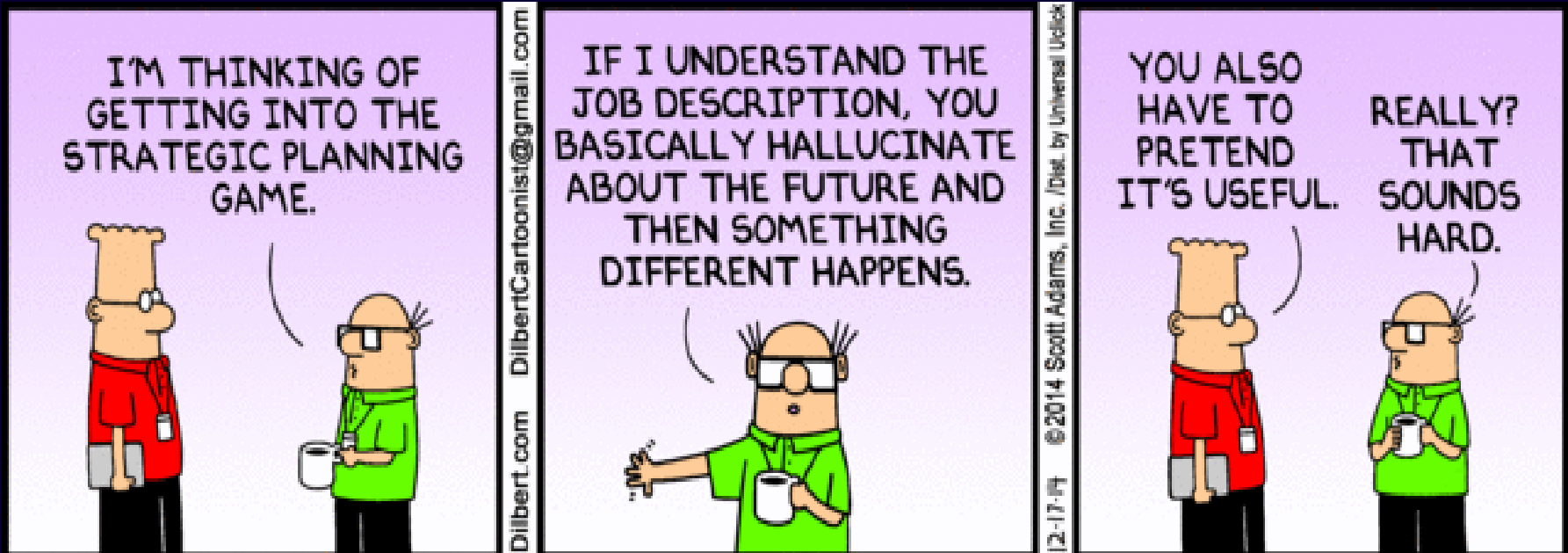
- ◆ **Streamline the scenario planning process**
- ◆ **Apply the method to a range of planning efforts and projects**
- ◆ **Evaluate the results**
- ◆ **Identify the lessons learned**

“Western Lands and Communities” Exploratory Scenario Planning

- ◆ **Demonstration projects:**
 - ❖ **Town of Sahuarita – General Plan Update**
 - ❖ **Upper Verde River Watershed Protection Coalition – Watershed Management Plan**
 - ❖ **Southwest Colorado Council of Governments – Economic Resilience Strategy**
- ◆ **Request for proposal will be sent out in February 2015 for 1 to 2 demonstration projects that will begin in July 2015**

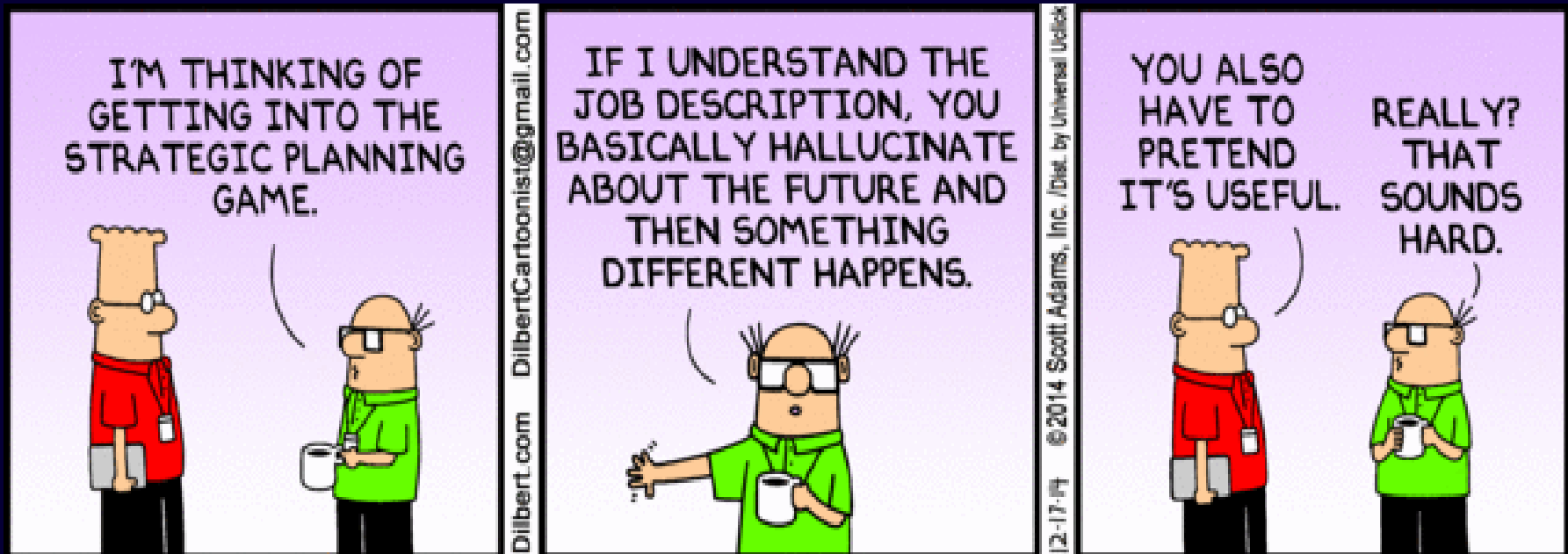
Planning for the Future

The Perils of Strategic Planning



Planning for the Future

The Perils of Strategic Planning



**What's Even Harder is Reacting
on the Trailing Edge**

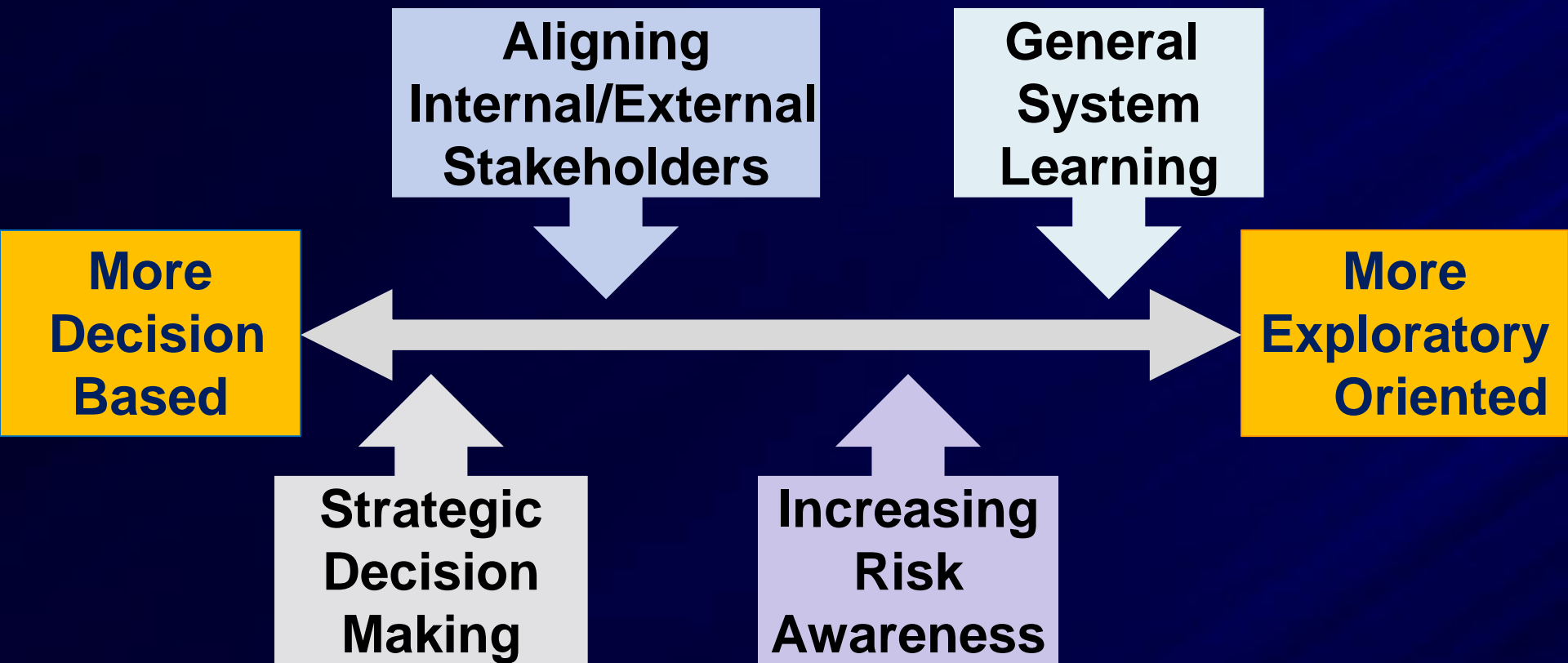
Scenario Planning

Where it Applies & What it Can Do

- ◆ Applies to dynamic planning environments where uncertainty is high
- ◆ Provides a “strategic” framework to address critical planning issues
- ◆ Identifies & prioritizes key planning uncertainties
- ◆ Assists in developing “consensus” about emerging challenges & adaptive opportunities
- ◆ Enhances planning flexibility & preparedness for whatever lies ahead

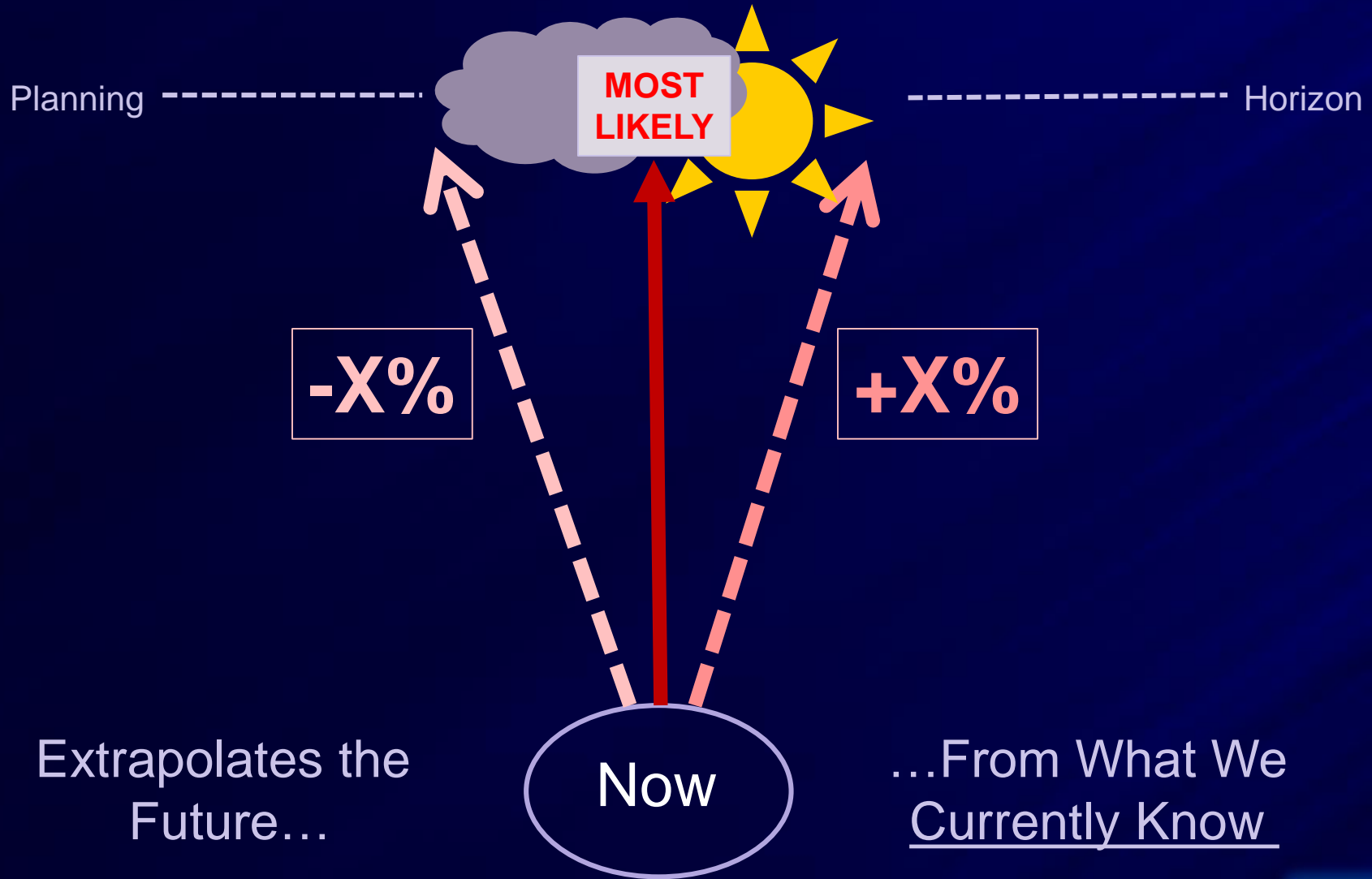
Scenarios and Uncertainty

A Range of Applications



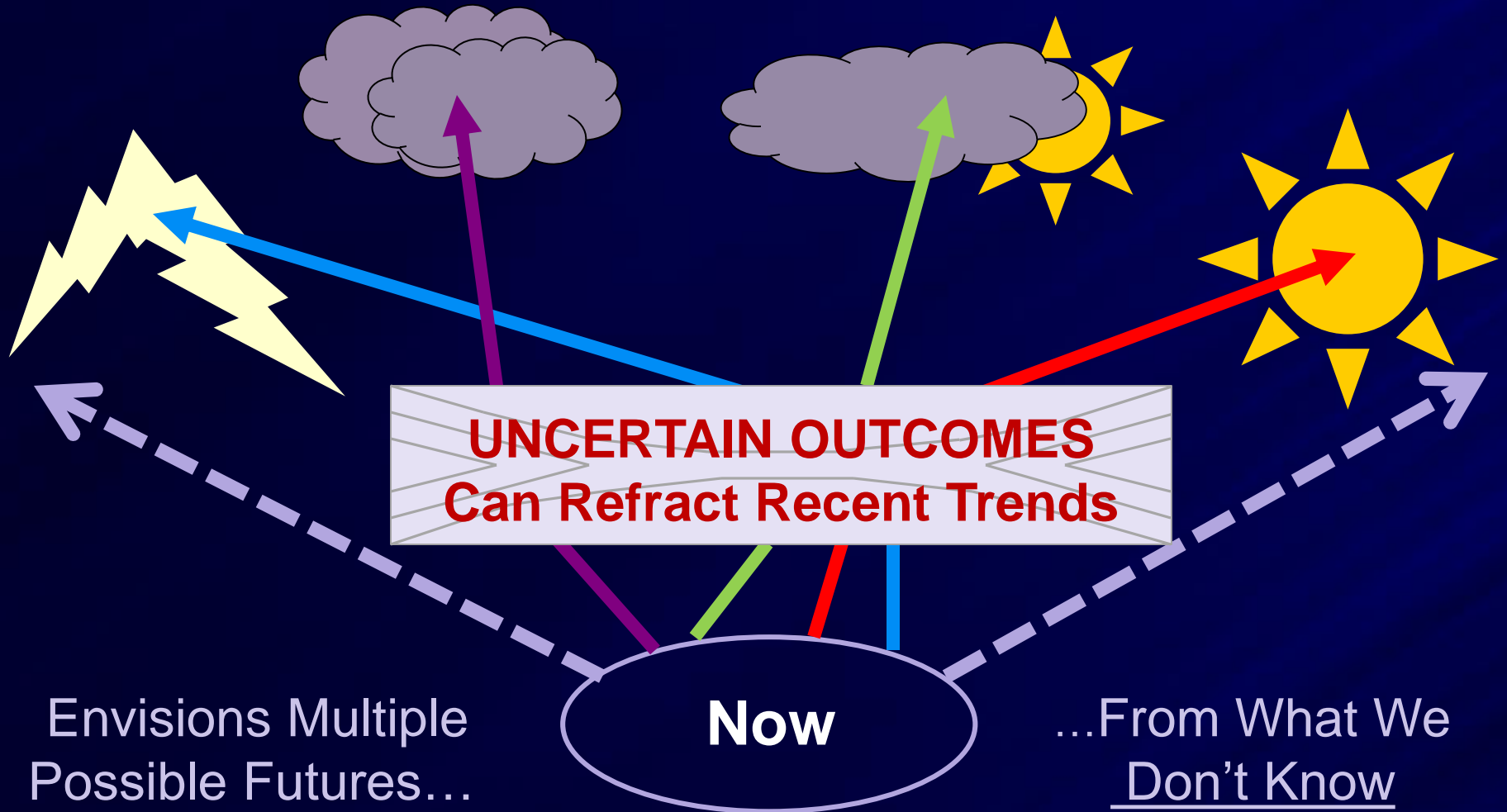
Traditional Predictive Planning

The Past is the Key to the Future

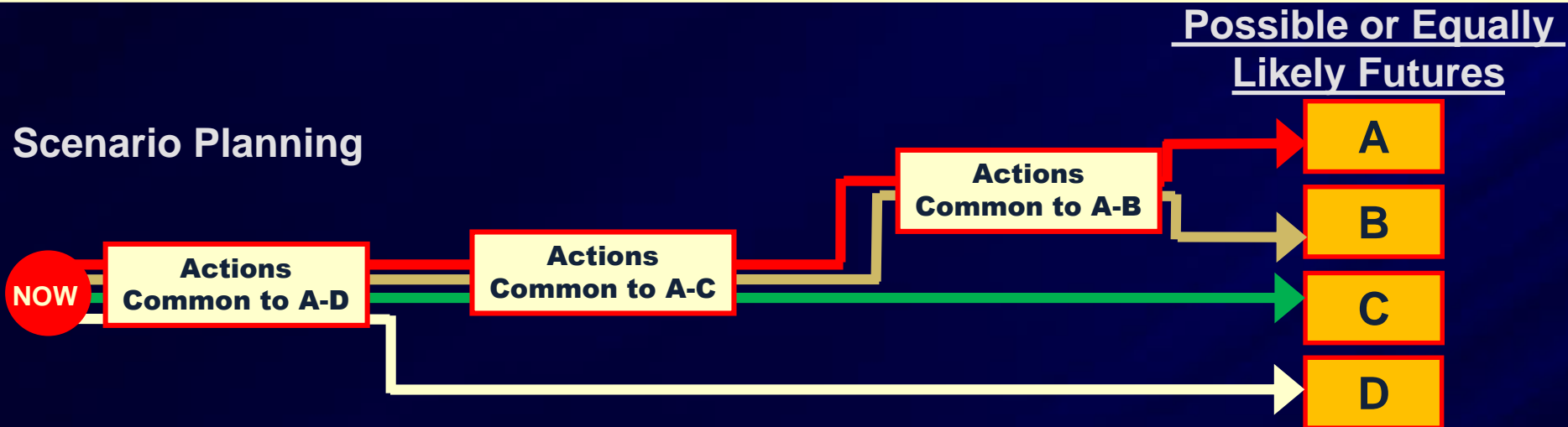


Scenario Planning

Explores a Broader Range of Future Possibility

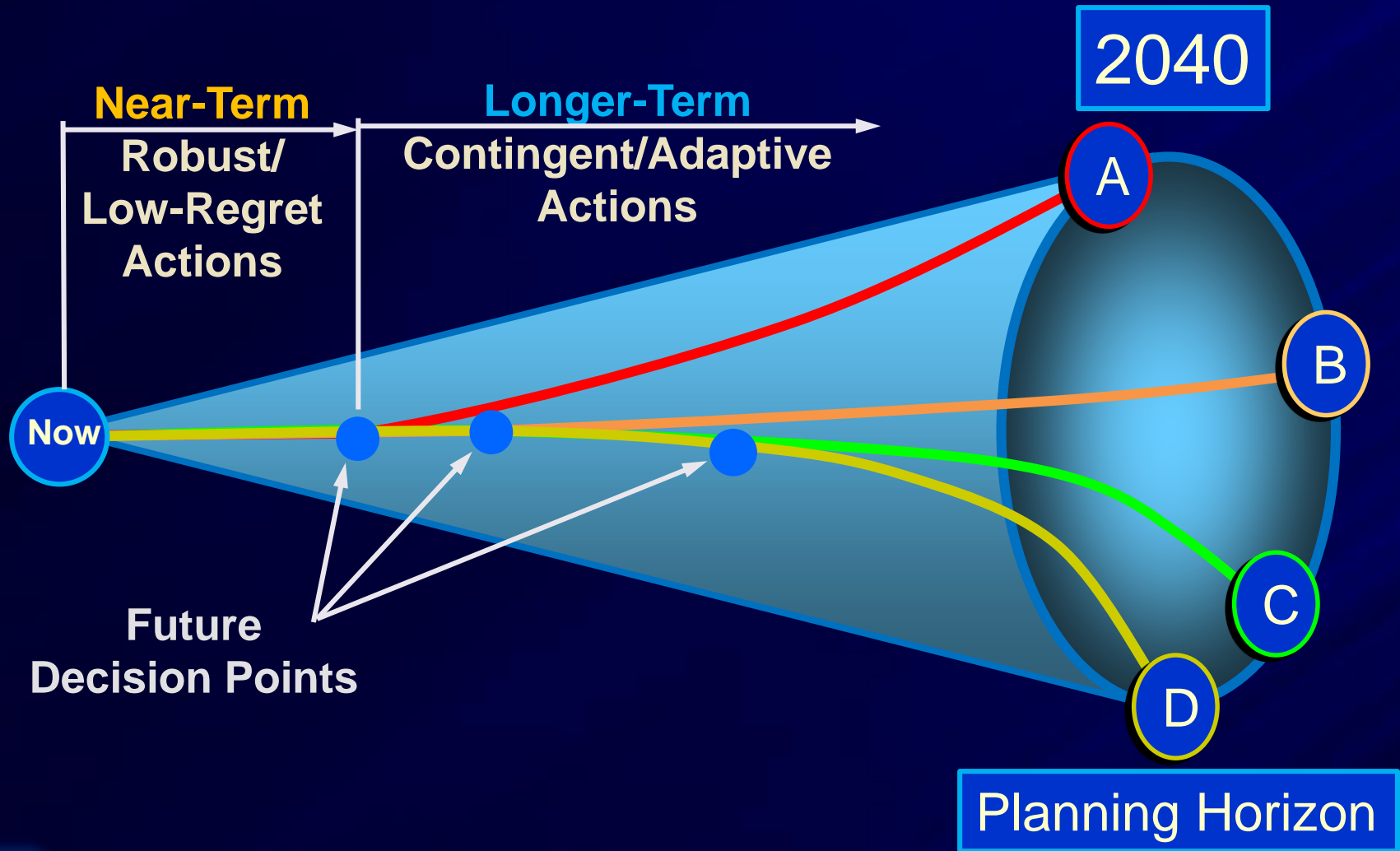


Contrasting the Methods



Defining the Range of Future Possibility

Developing the End-Member Futures



**“Prediction is
difficult, especially
about the future.”**

--Yogi Berra



Many Factors Can Influence Regional Issues in Southwest Colorado

Financing

State/Local
Politics

Environmental
Demand

Technologic
Innovation

Globalization

Public
Perception

How Many of These are Certain?

Water Supply
Reliability

Energy
Economics

Climate
Change

Drought

Economic
Growth
Rate

Future
Regulations

National
Politics

**Scenario Planning is not about
PREDICTING or FORECASTING what
will happen in the Future**



**It's about BEING PREPARED
for whatever happens
in the Future**

SCENARIO PLANNING

TWO BASIC TYPES
WITH MANY VARIATIONS

TRADITIONAL

**STAKEHOLDERS
WITHIN AN
ORGANIZATION**

VS

“HYBRIDIZED”

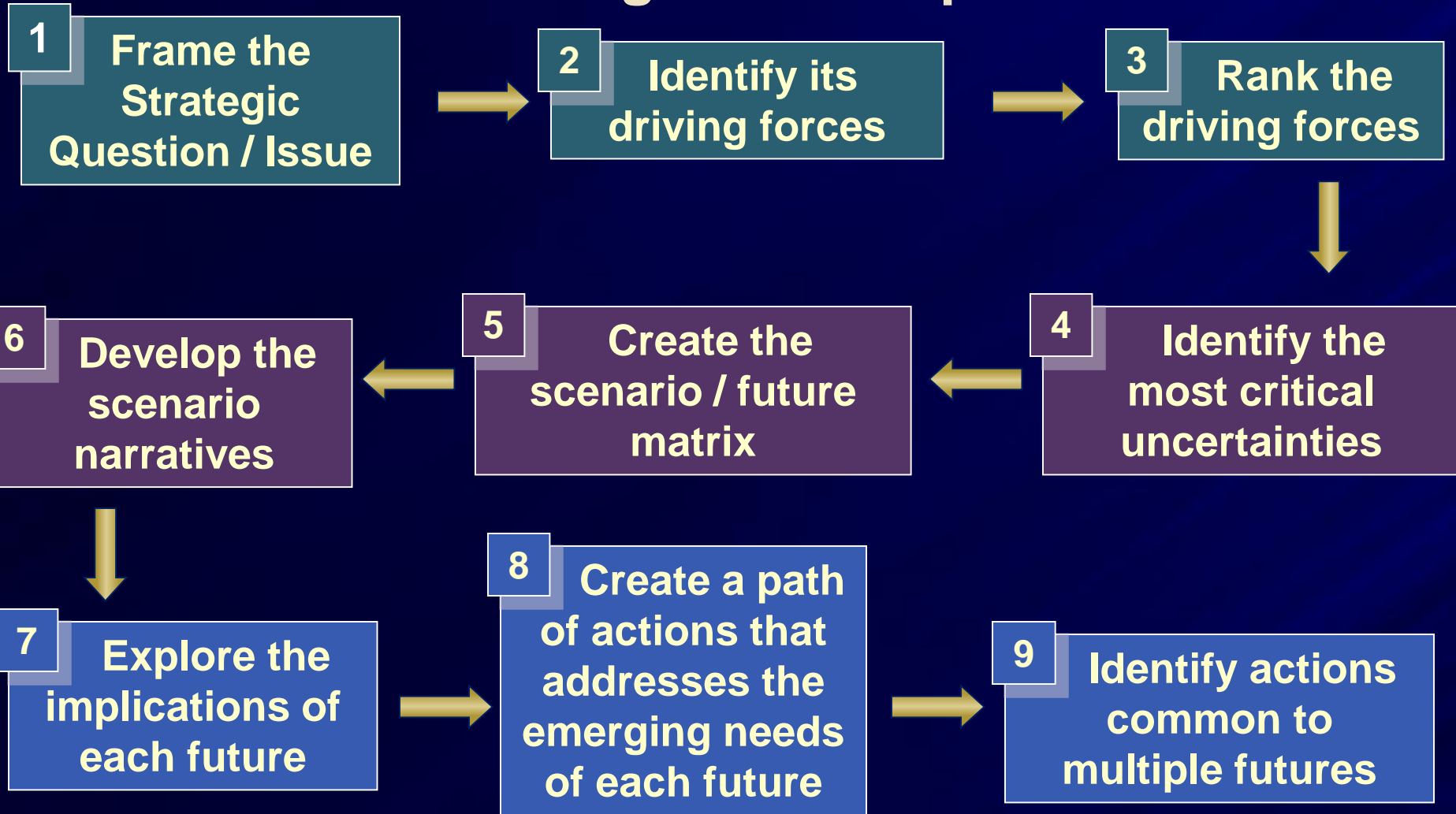
**STAKEHOLDERS
FROM MULTIPLE
ORGANIZATIONS**

Scenario Planning Applied

- **State of Colorado:** 2015 Water Plan Update
- **Multi-County** Regional Planning in NE Arizona
- **Sahuarita, AZ:** General Plan Development
- **Prescott Valley, AZ:** Watershed Protection
- **Tucson Water:** Shifting from Aquifer Depletion to Sustainable Resource Management
- **Denver Water:** Managing Climate Risks to Supply Reliability

A Structured Deliberative Process

A Program in Steps



Denver Water's Situation in 2008

Denver Water experienced its worst drought of record in 2002. It coincided with a very large wildfire in its supply watershed.

The severe drought and wildfire threatened the reliability and quality of the Utility's water supply.

Major conservation measures were implemented to reduce per capita demand and hence its vulnerability to shortage.

Utility had concerns the recent drought & wildfire could be harbingers of what to expect with longer-term climate change.

More frequent coupled events like those experienced could impact water quality & the Utility's access to its Colorado River allotment.

UTILITY WAS UNCERTAIN ABOUT HOW TO PREPARE FOR CLIMATE IMPACTS IN THE LONGER TERM

Denver Water's Scenario Planning Issue (2008)

“How can *Denver Water* maintain its current level of service in terms of supply reliability and water quality in the longer term?”

Tucson Water's Situation in 2004

The Utility had system corrosion problems when shifting from groundwater to CAP water in the early 1990s

CAP water's high salinity & the City's New Treatment Plant were blamed for the widely-reported "red water" issues

Customers came to distrust CAP water, the New Plant, & the UTILITY--CAP deliveries were suspended for 7 Years

Tucson came to use 40% of its CAP water by blending it with groundwater via recharge & recovery. What about the rest?

Community came to accept CAP recharge but not necessarily higher salinity & "chemical" treatment plants

UTILITY WAS UNCERTAIN ABOUT HOW TO PROCEED

Tucson Water's Scenario Planning Issue (2004)

“How should *the Utility* bring into full use its two currently available ‘renewable’ water resources?”

- Central Arizona Project Water
- Municipal Wastewater Effluent

Interviews with Key Stakeholders

Refining the Focal Question and Setting the Stage

- 1) What have been the most notable changes in Southwest Colorado in the last 20 years?
- 2) Which of these surprised you the most? Why were they so unexpected?
- 3) Was it possible to see these changes coming? What might have been the precursors?
- 4) Could you identify the most certain “trends” that WILL impact your region in the next 25 years?
- 5) Looking at your 25-year planning environment, what are the most critical uncertainties?



...AND SO ON...

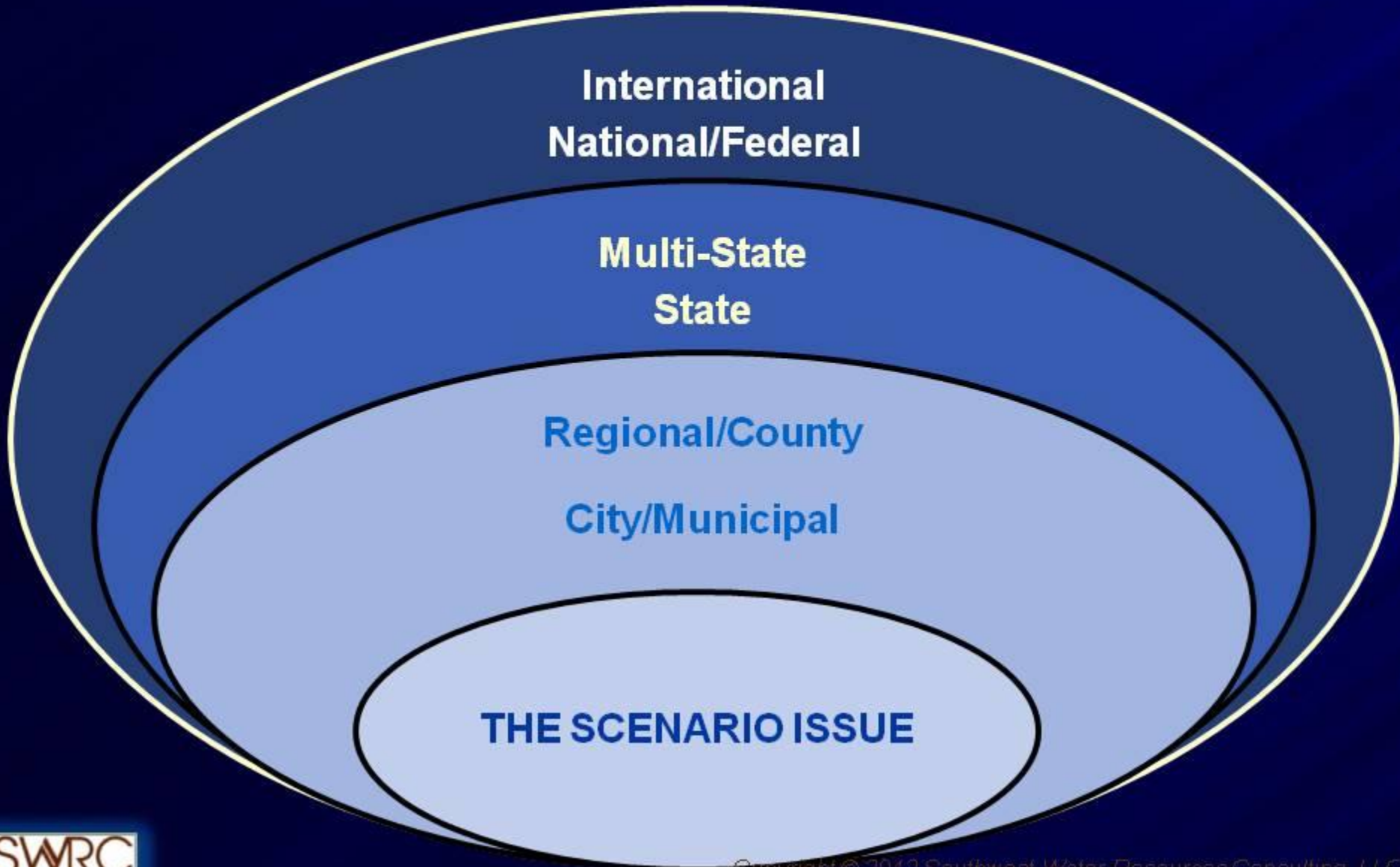
What are the Most Important Drivers?

Understanding the System's Influences



Understanding the System

Drivers Can Exert Influence on Many Levels



Tucson Water's List of Driving Forces Given its Simpler Scenario Issue

- 1) Public/Political Resistance/Support for Using a New "Chemical" Water Treatment Plant
- 2) Public/Political Resistance/Support for Recharging & Recovering All CAP Water Before Use

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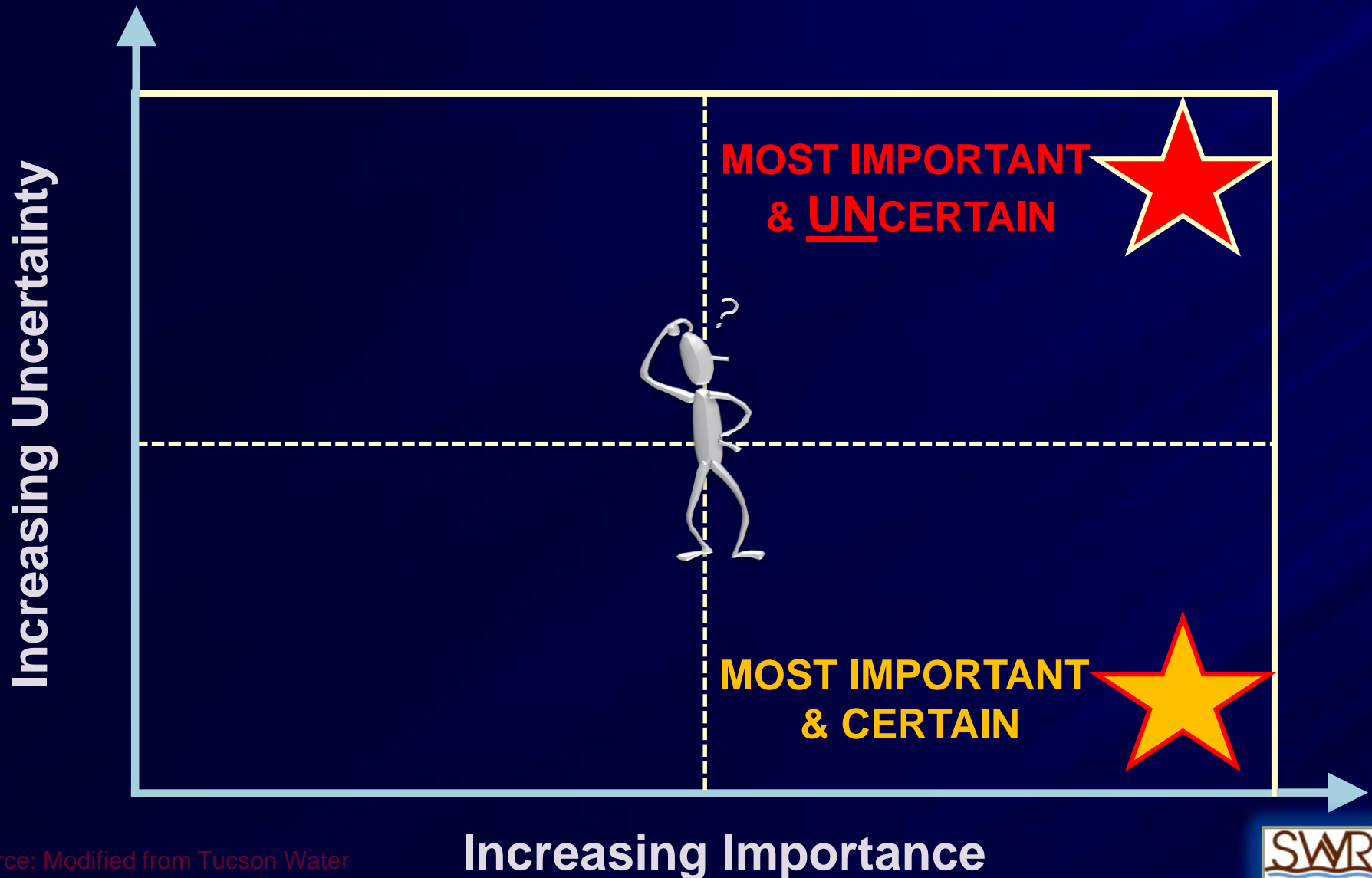
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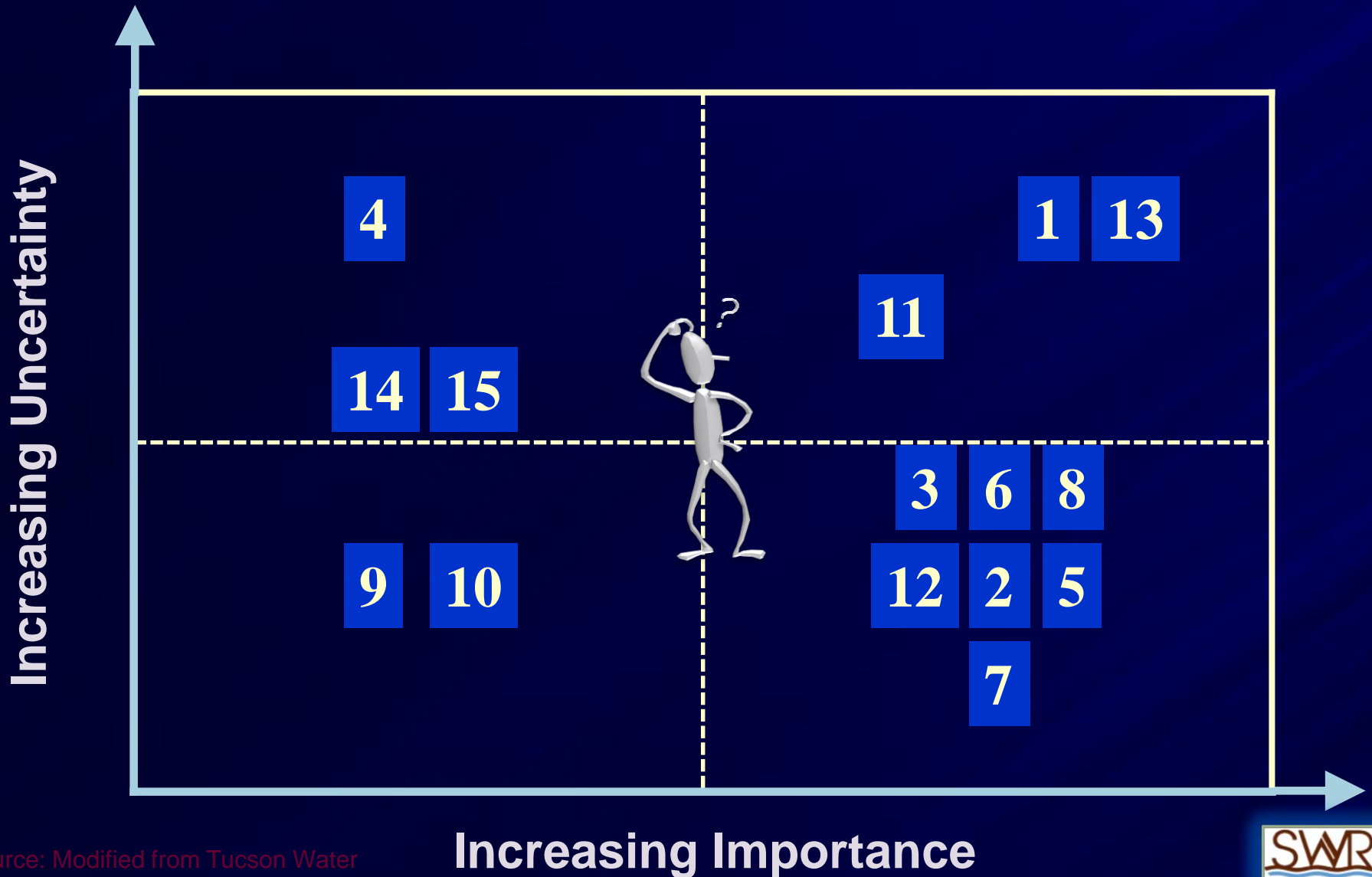
- 13) Public's Willingness to Pay Extra for "Aesthetic" Improvements to Water Quality
- 14) Tolerance of Local Residents to New Facilities
- 15) Environmental/Endangered Species Act Issues

Rank the Driving Forces

Identifying the Scenario Building Blocks

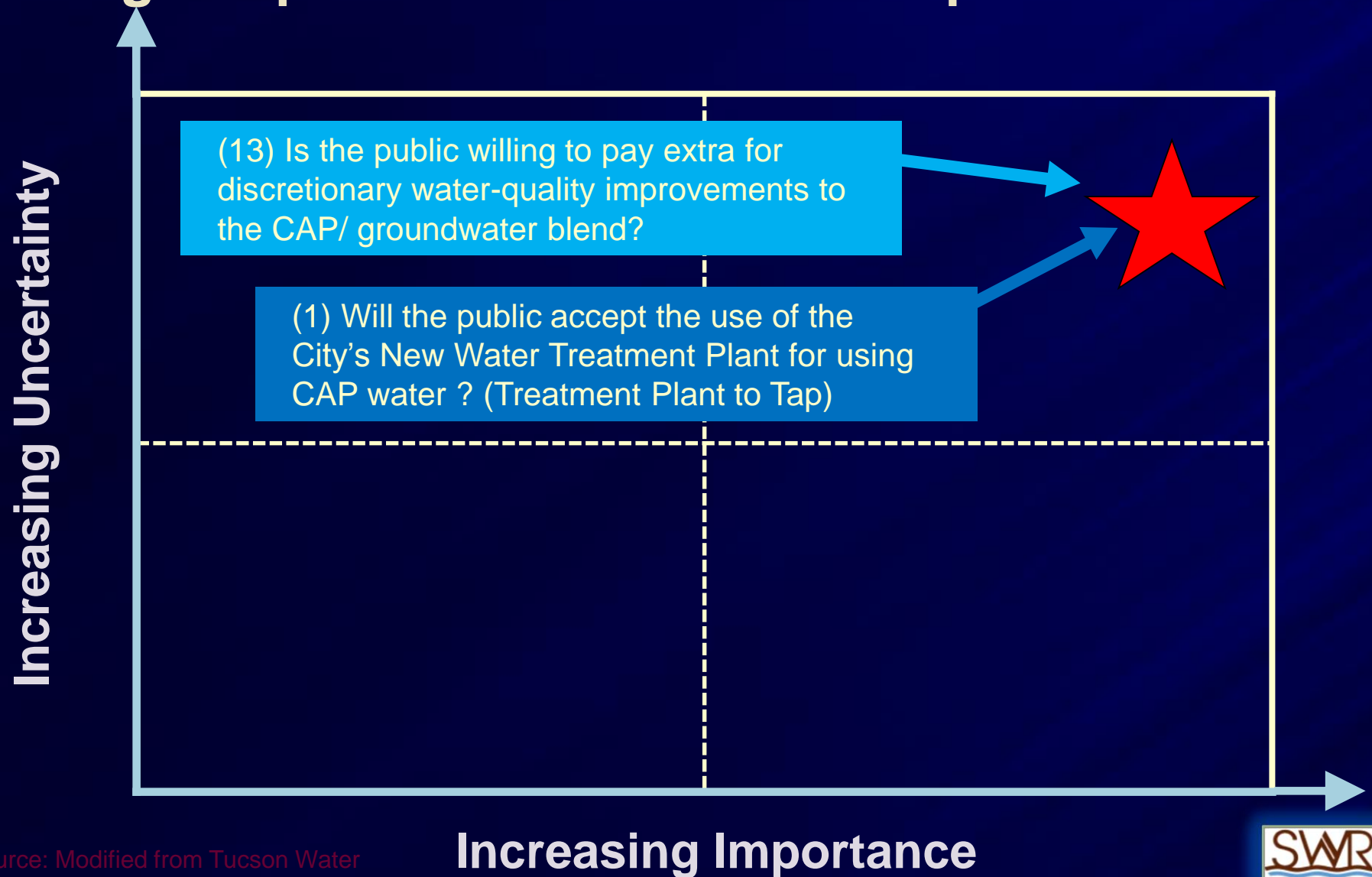


Ranking Tucson Water's Driving Forces



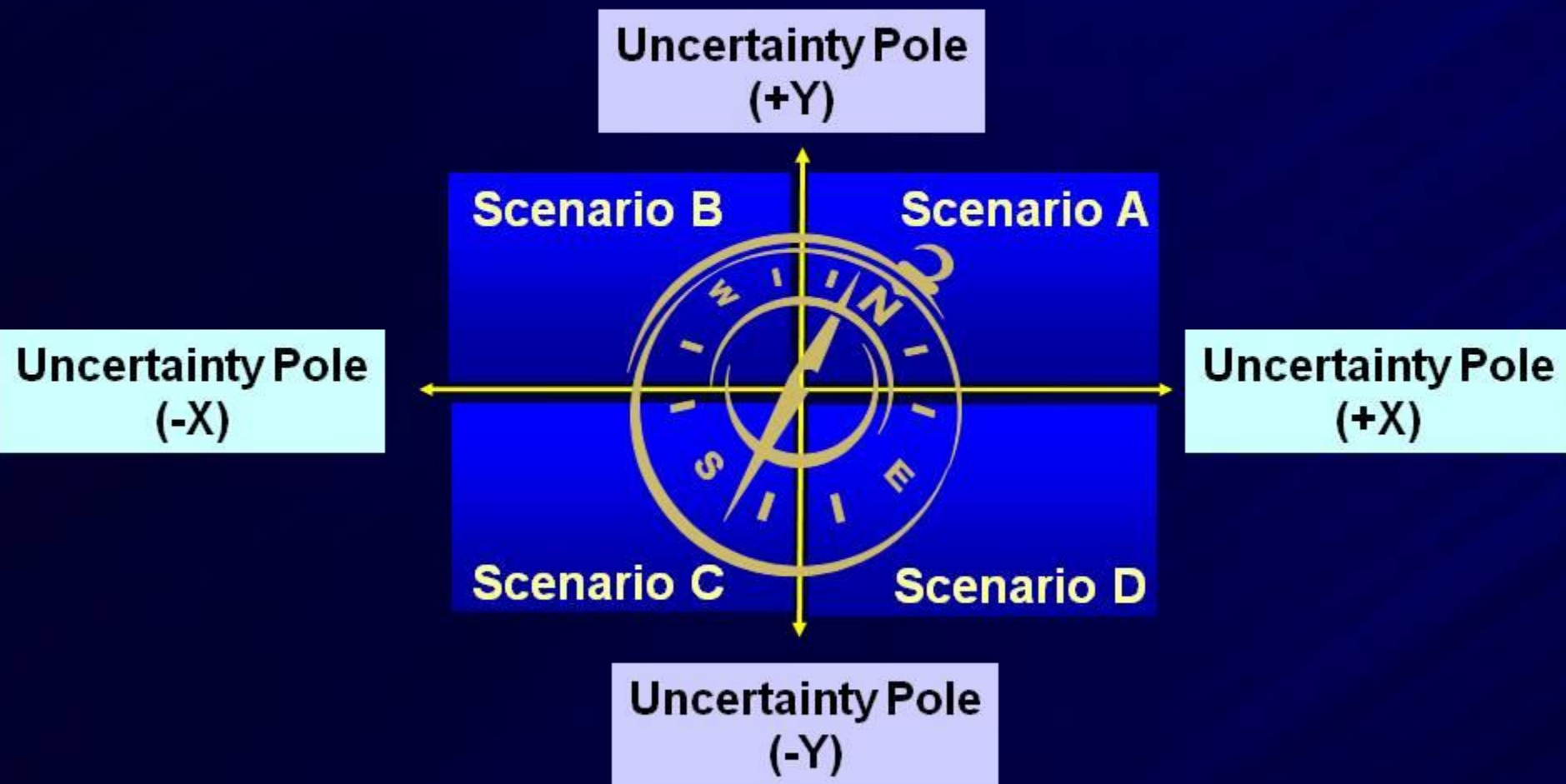
Identifying the Most Critical Uncertainties

High-Impact Drivers that Can “Tip the Future”



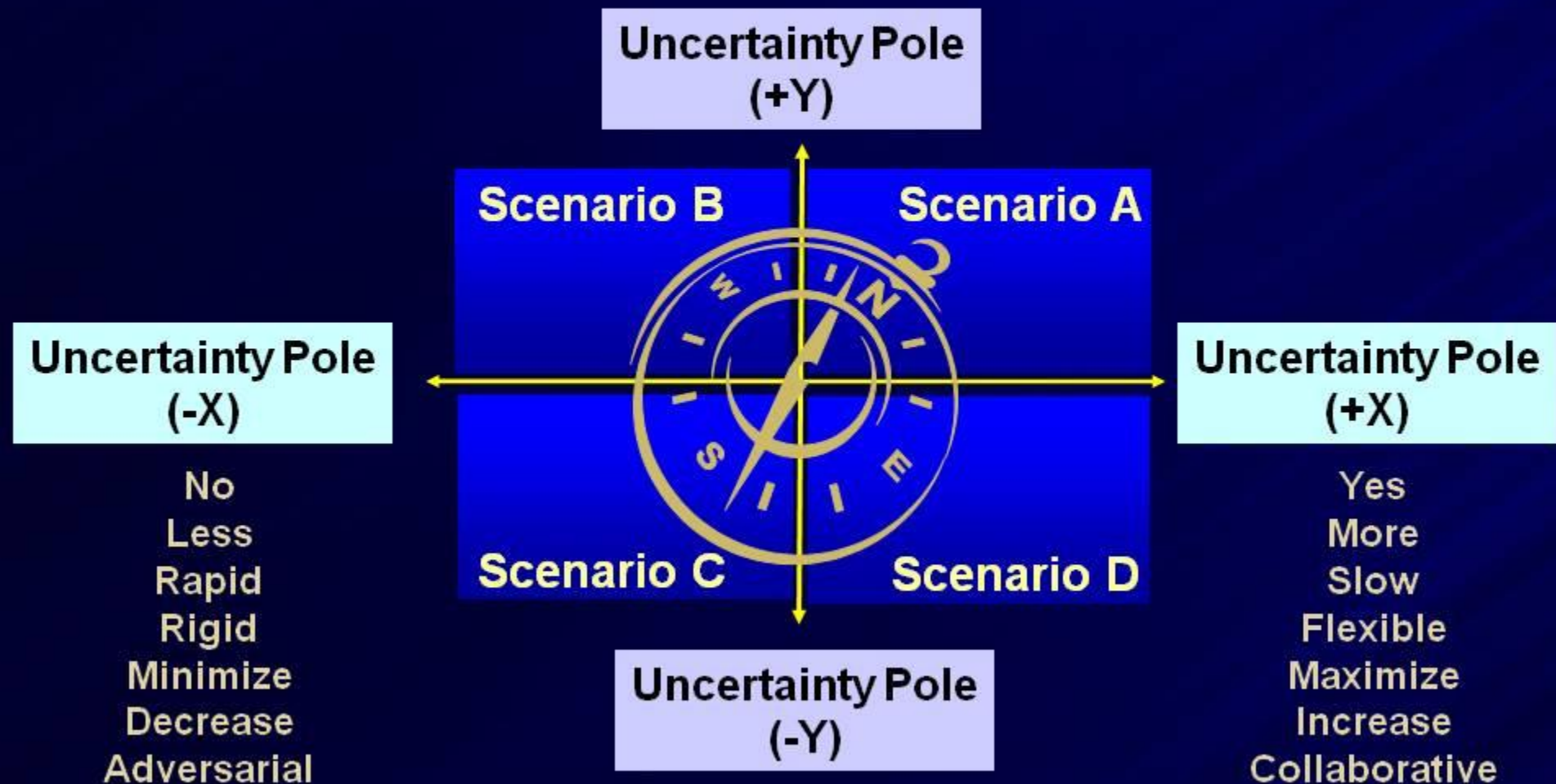
The Scenario Planning Matrix

With Two Uncertainty Axes—Four Futures



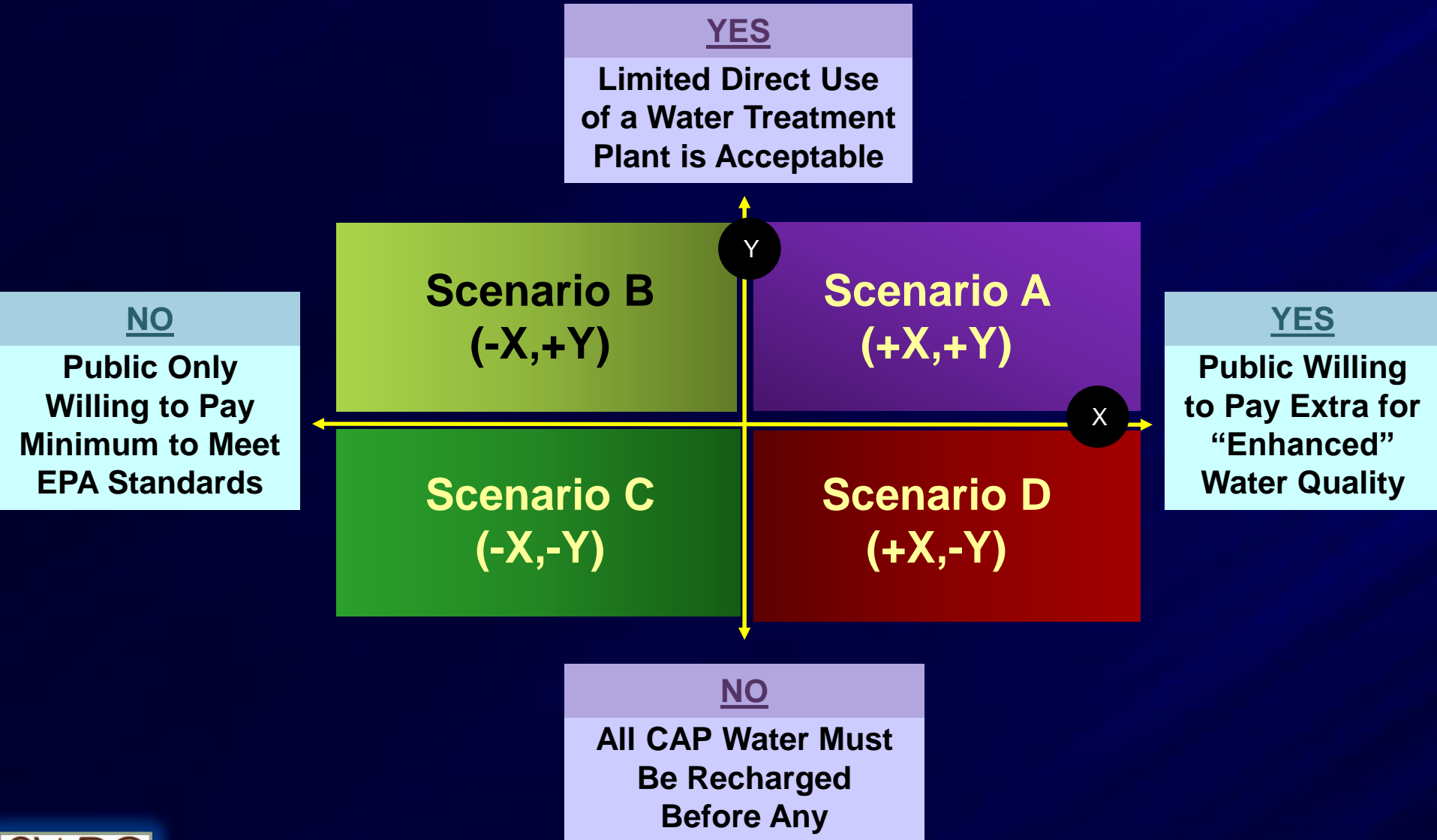
The Scenario Planning Matrix

With Two Uncertainty Axes—Four Futures

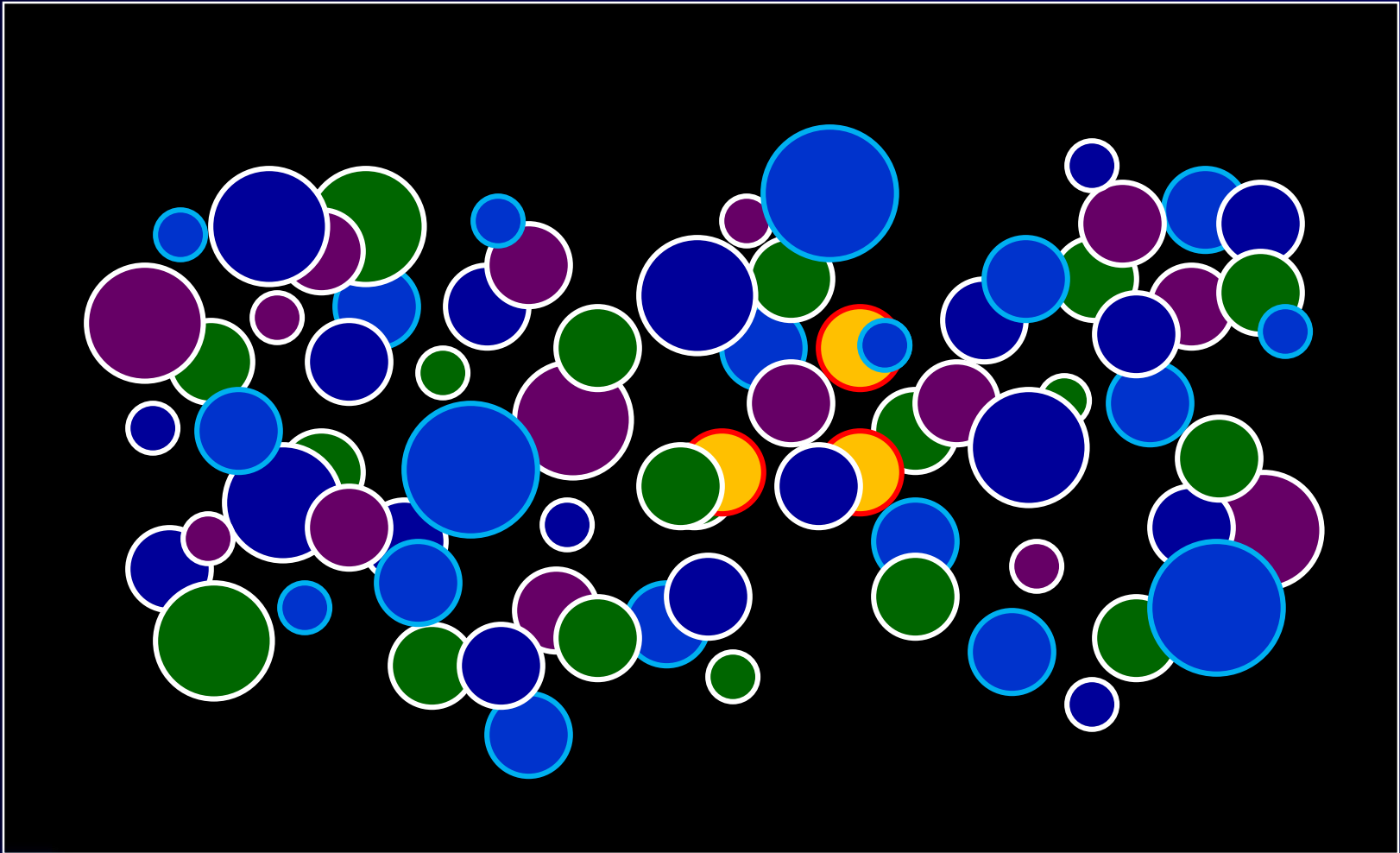


The Scenario Planning Matrix

Tucson Water's End-Member Futures

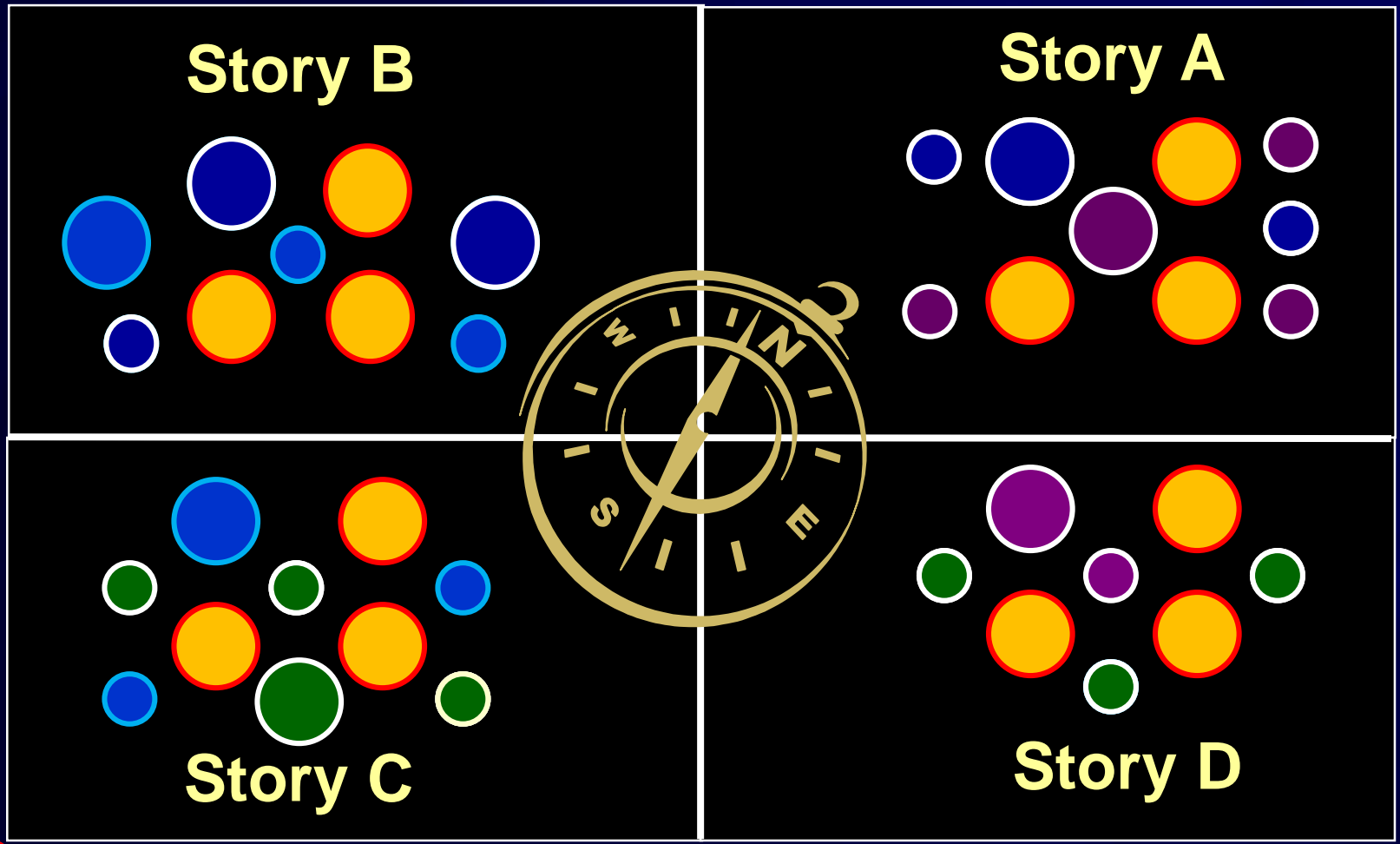


The Dynamic Planning Environment With Its Certainties and Many Uncertainties



Simplifying the Planning Environment

Develop Credible Stories about Possible Futures



 = "Certain" Elements

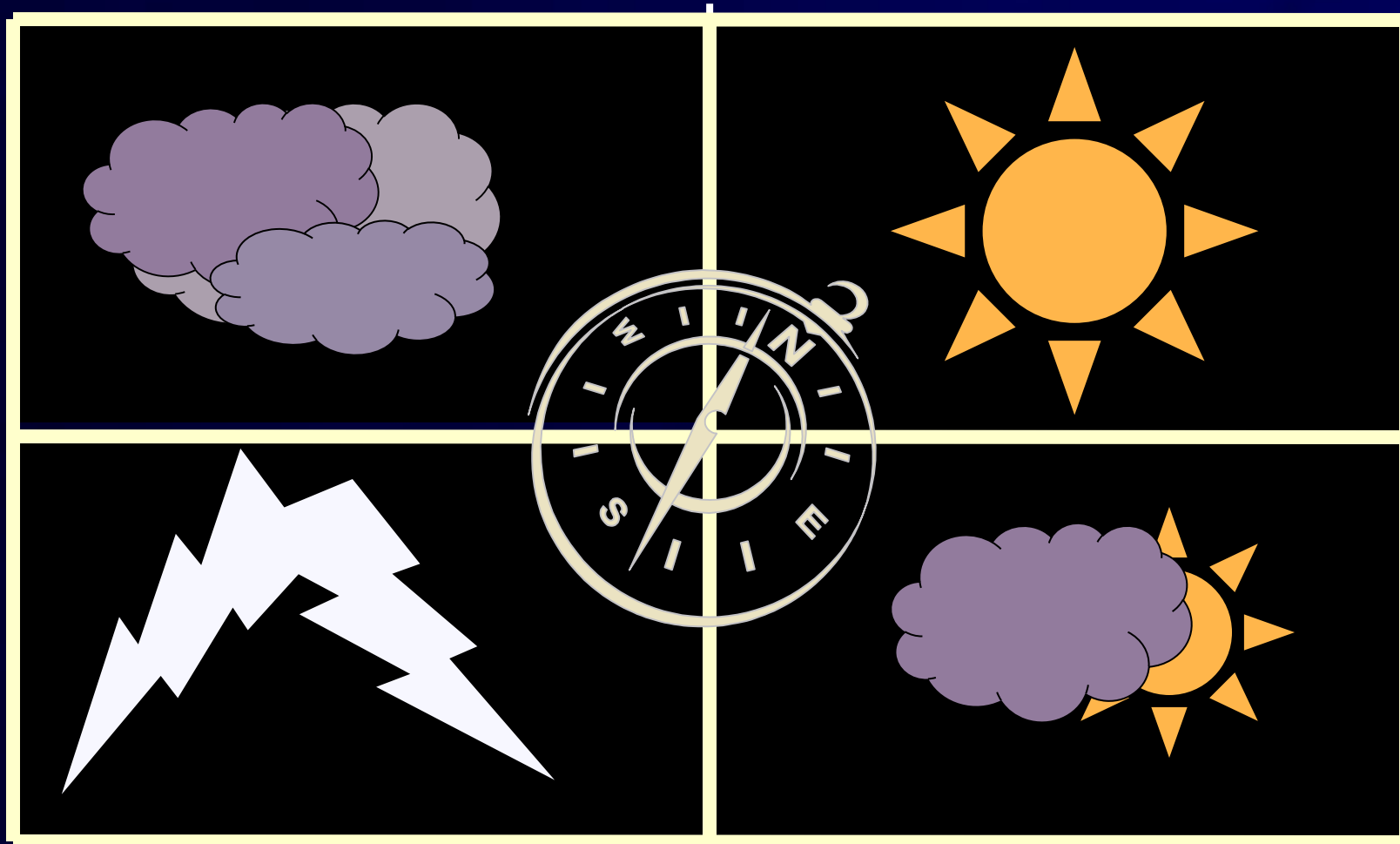
 = "Possible" Elements

Defining the Range of Future Possibility

Credible

Challenging

Divergent



The Evocative Power of the Narrative



The Power of the Narrative

A Common “Meta” Scenario Structure

**“Hard
Labor”**

**“Blue
Skies”**



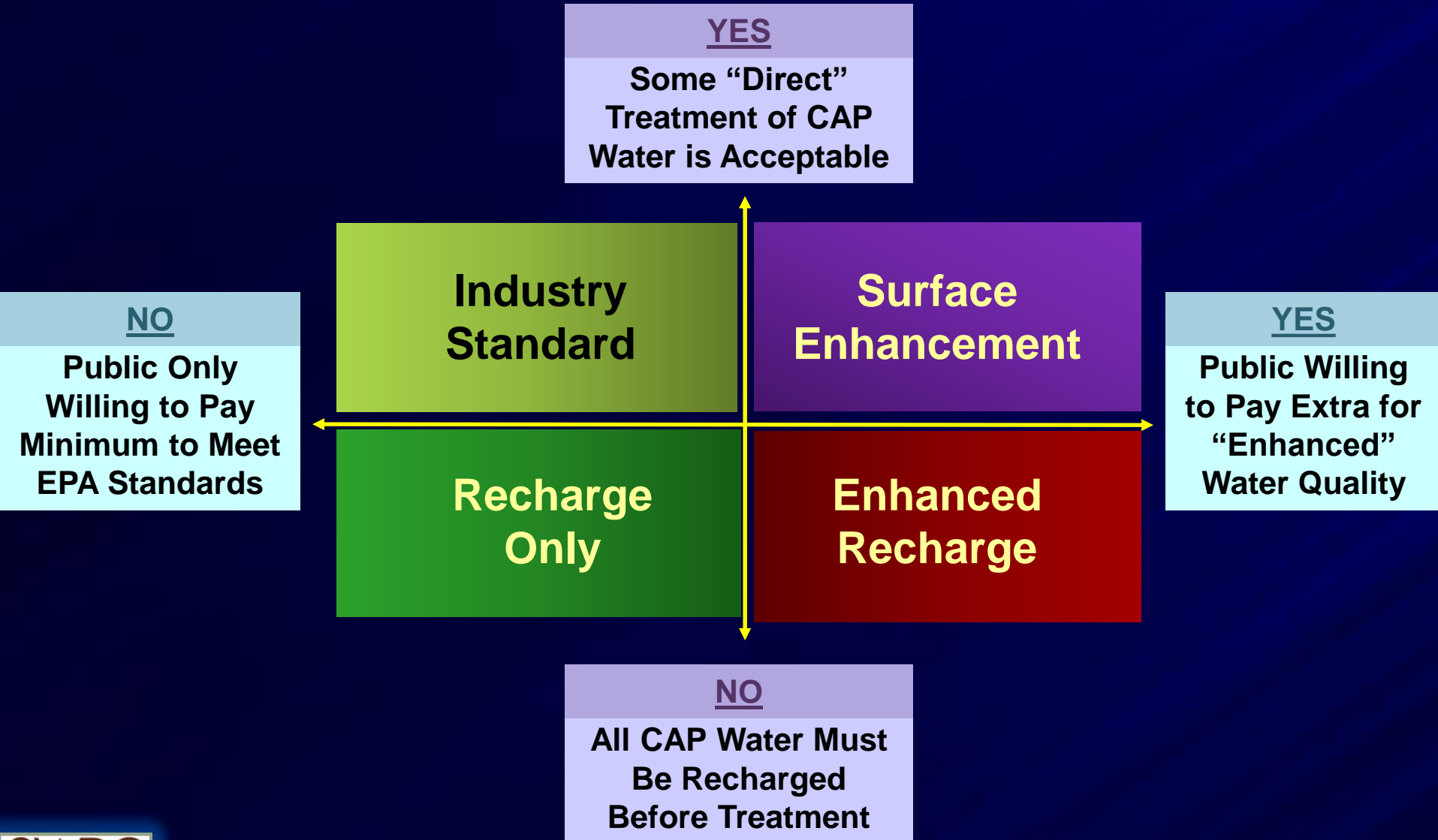
“Big Scary”

**“Better
or Worse?”**

The Power of the Narrative

- ◆ Scenarios are **VISIONING TOOLS** that can add something “**NEW**” by asking “**WHAT IF**”
- ◆ They can **PROVOKE** deeper insight by drawing on both **MENTAL & EMOTIONAL INTUITIONS**
- ◆ **WE ALL** tell “stories”—to ourselves and each other—to structure our relationships & our place in the World
- ◆ Organizations & Nations also tell stories—possibly of a **MYTHIC PAST** or an “**OFFICIAL**” **FUTURE**
- ◆ Narratives **CHALLENGE & BROADEN** our **VIEWS** about what may lie ahead

Tucson Water's Scenarios



Identifying the Functional Implications

What does each scenario mean to you?

- ◆ **WHAT** are the emerging challenges? **WHAT** are the envisioned vulnerabilities and risks for your region?
- ◆ **HOW** is each scenario constrained? How can your region benefit or lose given these constraints?
- ◆ **HOW** is each scenario freer and more open? How can your region benefit from this “openness” and **WHY**?
- ◆ **WHAT** are the emerging capabilities & opportunities? **WHAT** becomes possible?
- ◆ **WHO** in your region would benefit or lose given these opportunities? **HOW** might the latter react?

Implications Summary

	(Scenario A)	(Scenario B)	(Scenario C)	(Scenario D)
Multi-National & National	<ul style="list-style-type: none">• Implication A• Implication B• Implication AA			
Multi-State & State	<ul style="list-style-type: none">• Implication C• Implication D• Implication E			
County/ Municipal/ Local	<ul style="list-style-type: none">• Implication F• Implication G			
Organizational (Internal)	<ul style="list-style-type: none">• Implication H• Implication I• Implication J• Implication K			

Implications Summary

	(Scenario A)	(Scenario B)	(Scenario C)	(Scenario D)
Multi-National & National	<ul style="list-style-type: none">• Implication A• Implication B• Implication AA	<ul style="list-style-type: none">• Implication B• Implication L• Implication M	<ul style="list-style-type: none">• Implication B• Implication L• Implication T	<ul style="list-style-type: none">• Implication A• Implication B• Implication L• Implication AA
Multi-State & State	<ul style="list-style-type: none">• Implication C• Implication D• Implication E	<ul style="list-style-type: none">• Implication D• Implication E• Implication N	<ul style="list-style-type: none">• Implication D• Implication N• Implication U• Implication V	<ul style="list-style-type: none">• Implication C• Implication D• Implication V• Implication BB
County/ Municipal/ Local	<ul style="list-style-type: none">• Implication F• Implication G	<ul style="list-style-type: none">• Implication G• Implication O• Implication P	<ul style="list-style-type: none">• Implication G• Implication O• Implication W• Implication X	<ul style="list-style-type: none">• Implication F• Implication G• Implication W• Implication CC
Organizational (Internal)	<ul style="list-style-type: none">• Implication H• Implication I• Implication J• Implication K	<ul style="list-style-type: none">• Implication H• Implication I• Implication Q• Implication R• Implication S	<ul style="list-style-type: none">• Implication H• Implication Q• Implication R• Implication Y• Implication Z	<ul style="list-style-type: none">• Implication H• Implication I• Implication R• Implication Z• Implication DD

Identifying Potential Adaptive Actions

What can you do to prepare for each scenario?

- ◆ How can the **EMERGING VULNERABILITIES** and **RISKS** be addressed?
- ◆ How can constraints and deficiencies be **REMEDIED** or **MITIGATED**?
- ◆ What strategies & actions would be most **EFFECTIVE** given the envisioned conditions?
- ◆ What initiatives would enhance **PREPAREDNESS** by increasing future capability and flexibility?
- ◆ What (in)actions would **JEOPARDIZE** future viability?

Potential Actions Summary

	(Scenario A)	(Scenario B)	(Scenario C)	(Scenario D)
Multi-National & National	<ul style="list-style-type: none">• Action A• Action B			
Multi-State & State	<ul style="list-style-type: none">• Action C• Action D• Action E			
County/ Municipal/ Local	<ul style="list-style-type: none">• Action F• Action G• Action H• Action I			
Organizational (Internal)	<ul style="list-style-type: none">• Action J• Action K• Action L• Action M			

Potential Actions Summary

	(Scenario A)	(Scenario B)	(Scenario C)	(Scenario D)
Multi-National & National	<ul style="list-style-type: none">• Action A• Action B	<ul style="list-style-type: none">• Action A• Action N• Action O• Action P	<ul style="list-style-type: none">• Action A• Action N• Action O• Action P	<ul style="list-style-type: none">• Action A• Action B• Action N• Action AA
Multi-State & State	<ul style="list-style-type: none">• Action C• Action D• Action E	<ul style="list-style-type: none">• Action C• Action E• Action Q• Action R	<ul style="list-style-type: none">• Action C• Action E• Action Q• Action R• Action W	<ul style="list-style-type: none">• Action C• Action E• Action Q• Action R• Action BB
County/ Municipal/ Local	<ul style="list-style-type: none">• Action F• Action G• Action H• Action I	<ul style="list-style-type: none">• Action F• Action H• Action S• Action T	<ul style="list-style-type: none">• Action F• Action H• Action T• Action X• Action Y	<ul style="list-style-type: none">• Action F• Action H• Action T• Action Y• Action CC
Organizational (Internal)	<ul style="list-style-type: none">• Action J• Action K• Action L• Action M	<ul style="list-style-type: none">• Action J• Action L• Action M• Action U	<ul style="list-style-type: none">• Action J• Action L• Action U• Action V	<ul style="list-style-type: none">• Action J• Action L• Action U• Action Z

Identifying Robust & Prudent Actions

	All Potential Actions
<u>Scenario A</u>	A, B, C, D, E F, G, H, I, J, K L, M, BB, DD
<u>Scenario B</u>	A, C, E, F, H, J, L, M, N, O P, Q, R, S, T, U, V, W, Y
<u>Scenario C</u>	A, C, E, F, H J, L, N, O, P, Q R, T, U, V, W X, Y, Z
<u>Scenario D</u>	A, B, C, E, F H, J, L, N, Q R, T, U, Y, Z AA, BB, CC, DD

Identifying Robust & Prudent Actions

	All Potential Actions	Potentially Robust Actions
<u>Scenario A</u>	A, B, C, D, E F, G, H, I, J, K L, M, BB, DD	A, C, E, F, H J, L, N, Q, R T, U, V, Y
<u>Scenario B</u>	A, C, E, F, H, J, L, M, N, O P, Q, R, S, T, U, V, W, Y	<p>THESE ARE “LOW- REGRET” ACTIONS <u>COMMON</u> <u>TO</u> <u>MULTIPLE</u> <u>FUTURES</u></p>
<u>Scenario C</u>	A, C, E, F, H J, L, N, O, P, Q R, T, U, V, W X, Y, Z	
<u>Scenario D</u>	A, B, C, E, F H, J, L, N, Q R, T, U, Y, Z AA, BB, CC, DD	

Identifying Robust & Prudent Actions

	All Potential Actions	Potentially Robust Actions	Potentially Prudent Actions
<u>Scenario A</u>	A, B, C, D, E F, G, H, I, J, K L, M, BB, DD	A, C, E, F, H J, L, N, Q, R T, U, V, Y	O, P, W, Z BB, DD THESE ACTIONS DEPEND ON PERCEIVED RISKS & <u>WHAT WE MIGHT DO</u> <u>TO</u> <u>CONTAIN</u> <u>THEM</u>
<u>Scenario B</u>	A, C, E, F, H, J, L, M, N, O P, Q, R, S, T, U, V, W, Y		
<u>Scenario C</u>	A, C, E, F, H J, L, N, O, P, Q R, T, U, V, W X, Y, Z		
<u>Scenario D</u>	A, B, C, E, F H, J, L, N, Q R, T, U, Y, Z AA, BB, CC, DD		

Identifying Robust & Prudent Actions

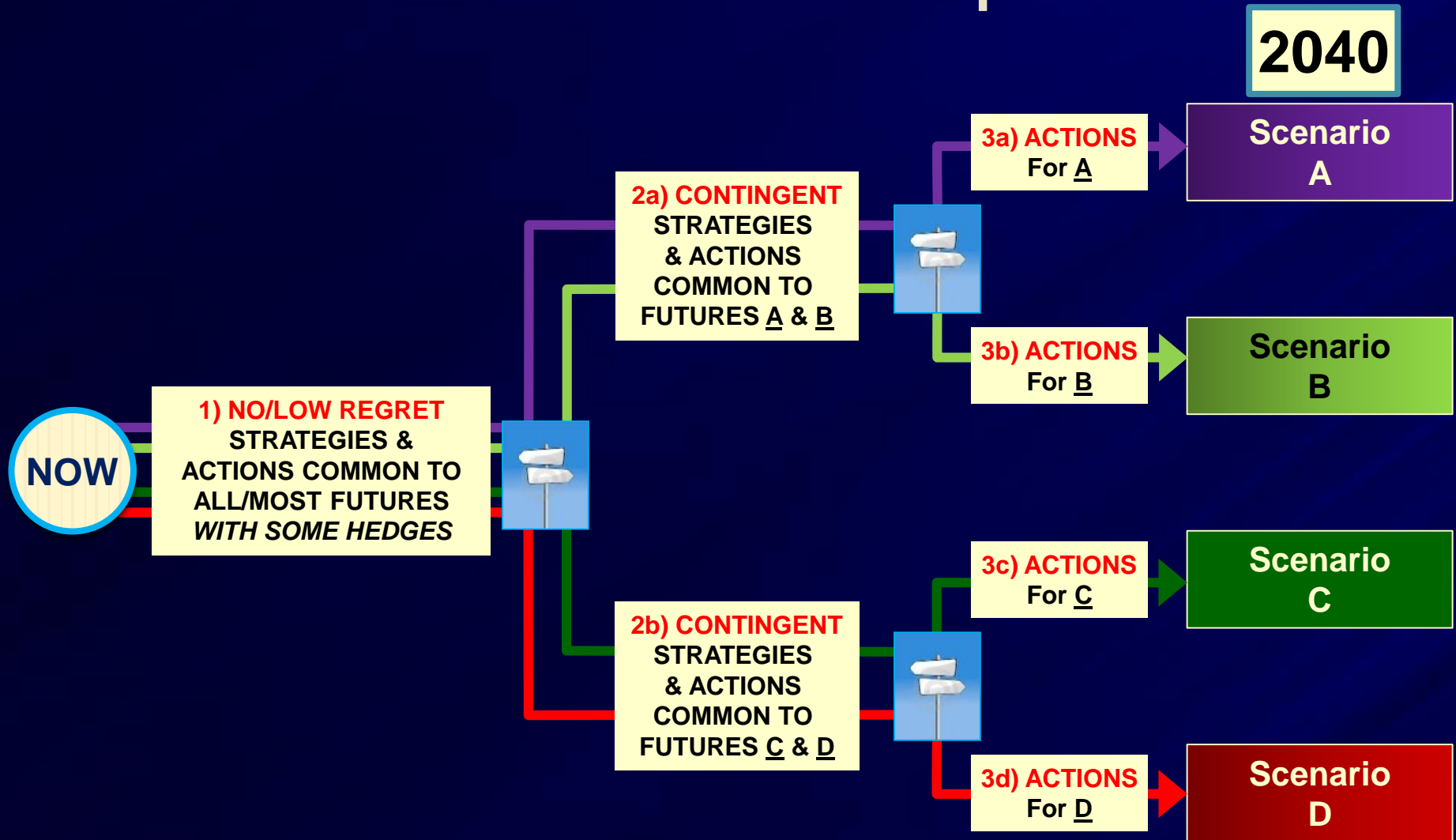
	All Potential Actions	Potential Robust Actions	Potential Prudent Actions	Potential Recommended Actions
<u>Scenario A</u>	A, B, C, D, E F, G, H, I, J, K L, M, BB, DD	A, C, E, F, H J, L, N, Q, R T, U, V, Y	O, P, W, Z BB, DD	C, H, J, L, N, O, P, R, T, Y W, DD FINAL SELECTION WILL DEPEND ON ADDITIONAL ANALYSIS & ONE'S RISK TOLERANCE
<u>Scenario B</u>	A, C, E, F, H, J, L, M, N, O P, Q, R, S, T, U, V, W, Y			
<u>Scenario C</u>	A, C, E, F, H J, L, N, O, P, Q R, T, U, V, W X, Y, Z			
<u>Scenario D</u>	A, B, C, E, F H, J, L, N, Q R, T, U, Y, Z AA, BB, CC, DD			

Developing an Effective Strategic Plan

Some Things to Consider

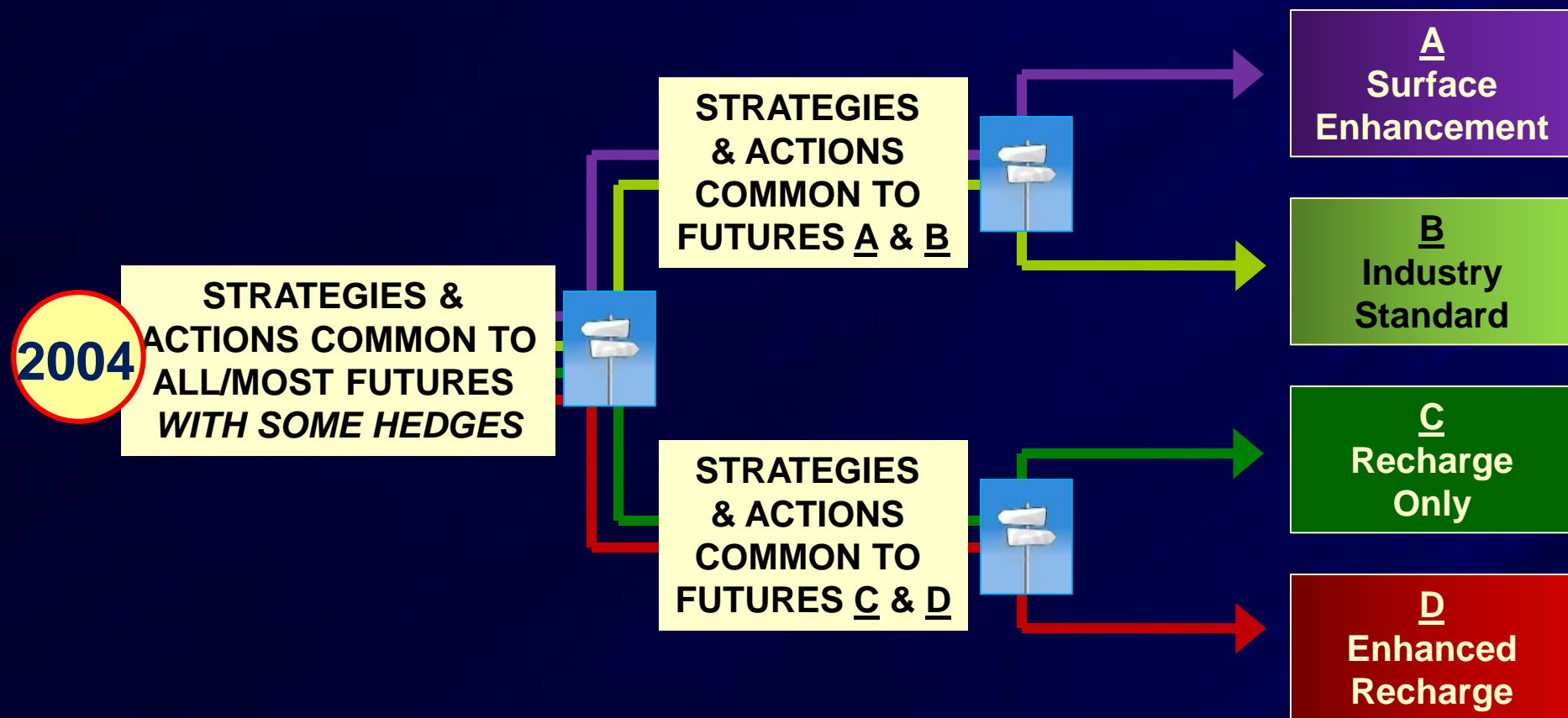
- ◆ Which “LOW-REGRET” strategies & actions are common to MOST FUTURES?
- ◆ Which apply only to one or two but could be prudent hedges to off-set BIG POTENTIAL RISKS?
- ◆ Which actions would increase planning FLEXIBILITY and ADAPTIVE CAPACITY?
- ◆ How might evolving events be influenced so that a given scenario “MUST BE” ACHIEVED or AVOIDED?
- ◆ What actions could increase the potential for “HIGH REGRET” outcomes?

A Scenario Planning Strategy Pre-Positioned and Prepared



Tucson's "Weighted Robust" Strategy

Pre-Positioned and Prepared in 2004





Initiating Implementation

Moving Forward With a Flexible Plan



2004

Action Set #1
CAVSARP Expansion
CAP Delivery Flexibility
Rch vs Dir. Treat Study
Disinfection Evaluation
WQ/TDS Assessment
Public Preferences
SAVSARP Feasibility
Pipe Routing Studies



SOME DIRECT TREATMENT

ALL RECHARGE

A
Surface Enhancement

B
Industry Standard

C
Recharge Only

D
Enhanced Recharge

At First Junction

A Decision that "Tipped" Tucson's Future

2004

- Action Set #1**
- CAVSARP Expansion
 - CAP Delivery Flexibility
 - Rch vs Dir. Treat Study
 - Disinfection Evaluation
 - WQ/TDS Assessment
 - Public Preferences
 - SAVSARP Feasibility
 - Pipe Routing Studies



2006

~~SOME DIRECT TREATMENT~~



ALL RECHARGE

~~A
Surface
Enhancement~~

~~B
Industry
Standard~~

C
Recharge
Only

D
Enhanced
Recharge

Looking Beyond

Old Futures Fade & New Ones Arise



2004

Action Set #1
CAVSARP Expansion
CAP Delivery Flexibility
Rch vs Dir. Treat Study
Disinfection Evaluation
WQ/TDS Assessment
Public Preferences
SAVSARP Feasibility
Pipe Routing Studies



2006

~~SOME DIRECT TREATMENT~~



ALL RECHARGE

2015



~~A
Surface Enhancement~~

~~B
Industry Standard~~

C
Recharge Only

D
Enhanced Recharge

Action Set #2
SAVSARP Construction
Pipe Routing Studies
CAVSARP Expansion
CAP Delivery Flexibility
WQ/TDS Assessment
Triple-Bottom-Line Eval



Key Walk Away Messages

- ◆ **Critical Uncertainties** Can Dominate Your Region's Planning Environment
- ◆ Future Change may not be Predictable
- ◆ Some Decisions Cannot Wait for Certainty
- ◆ Effective Planning is about **Being Prepared for Whatever Happens**—It's about Being Flexible
- ◆ Policies & Investments which apply to a **Wide Range of Possible Futures** can enhance your Region's **Ability to Adapt to Change**

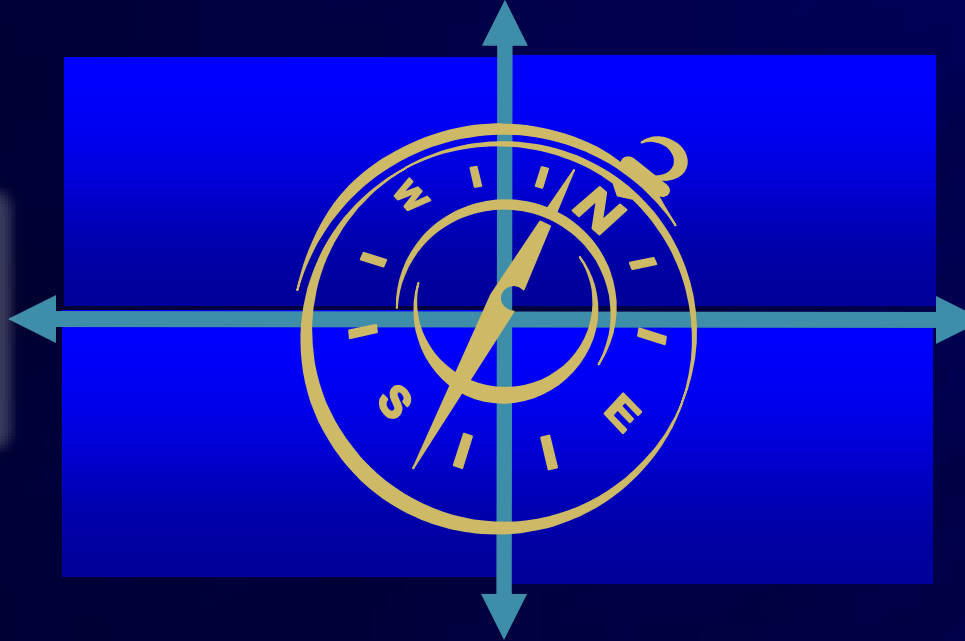
Main Tasks and Schedule

SWCCG Exploratory Scenario Planning Project

1	Present to SWCCOG Board	Feb 6, 2015
2	Conduct Preliminary Interviews	Feb 2015
3	Conduct Workshop #1	April 2015
4	Conduct Workshop #2	June 2015
5	Conduct Optional Workshops	June/July 2015
6	Analyze & Integrate Results	June-Aug 2015
7	Prepare & Submit Draft Report	Aug/Sept 2015



Thank You



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