MARC Scenario Planning Workshop

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Part 2 – Considering the Impacts

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Population (2015) 4.1M
Land Area 10,600 sq.mi.

Population Growth (2000 –2012)
Overall: 30.60%
Annual: 2.78%

Total Employment (2015)
1.7M

Existing Freeway/Highway
850 centerline miles

Principal Arterials
4,000 directional miles

Transit service
59 Local Bus Routes – 59 M riders /yr
21 Express, 5 Rapid Lines
20 mi. Rail Line – 14 M riders/yr

Differentiation vs. Integration

"Scenario Planning is the best tool I know to allow the conversation to reflect different perceptions of the situation (differentiation), but in such a way to create room for people to consider these different viewpoints and gradually align on what needs to be done……(integration)"

Peter Schwartz, Futurist, Innovator and Scenario Planning Pioneer

What is Scenario Planning?

Scenarios represent alternative future conditions that could materialize in response to drivers such as shifts in external forces (for example new technology, environmental patterns or global trade patterns) or the consequences of deliberate policy choices played out over time (such as land use policies or infrastructure investments)

https://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook_2011/guidebook.pdf

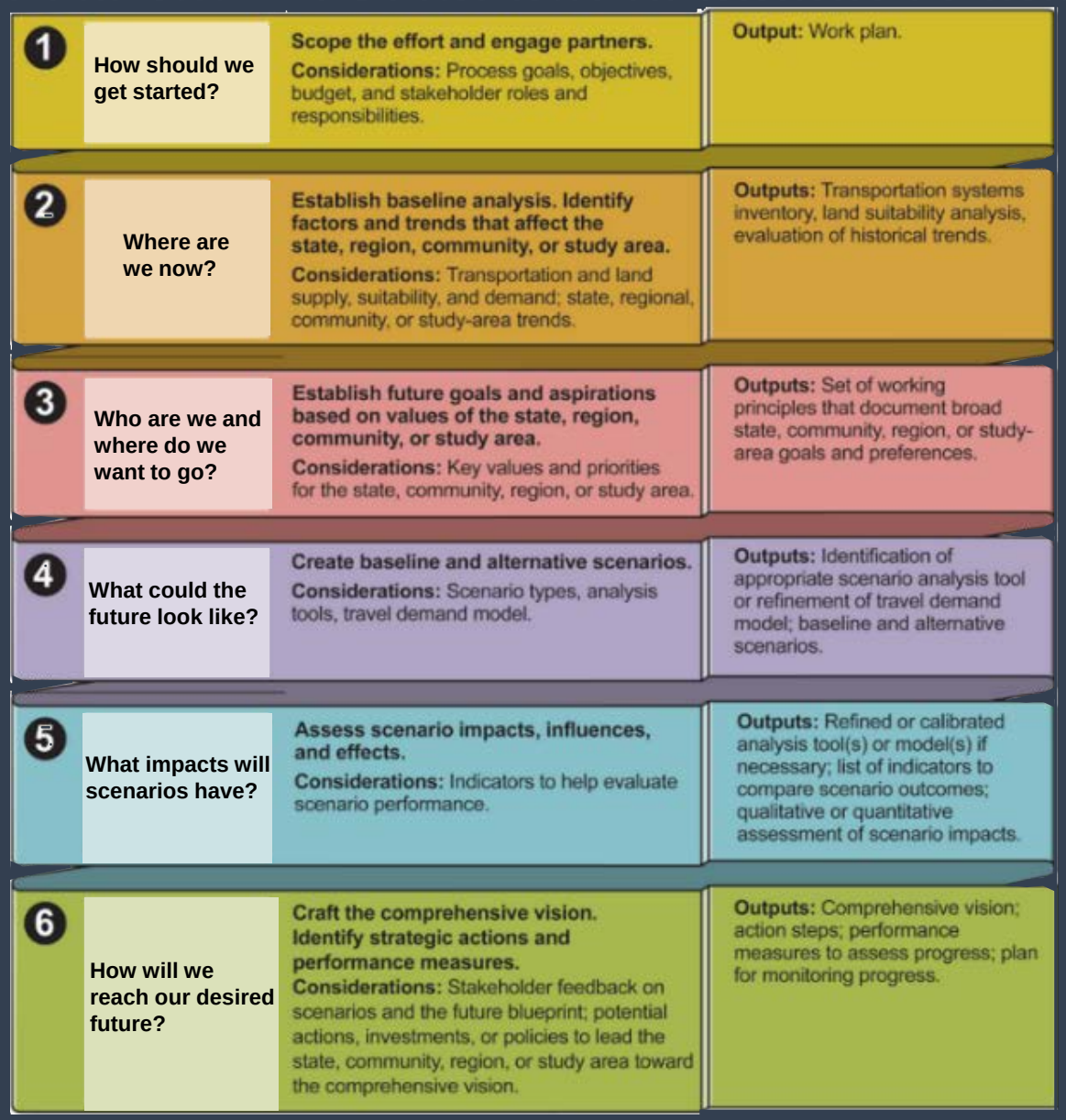
Scenario Planning in Transportation

Benefits

- Enables better integration of land use and transportation
- Helps demonstrate how development influences travel behavior and travel demand
- Engages diverse stakeholder groups
- Helps to address the 3Cs (comprehensive, continuous, coordinated) systems planning.

https://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook_2011/guidebook.pdf

FHWA six-phase Scenario Planning Framework



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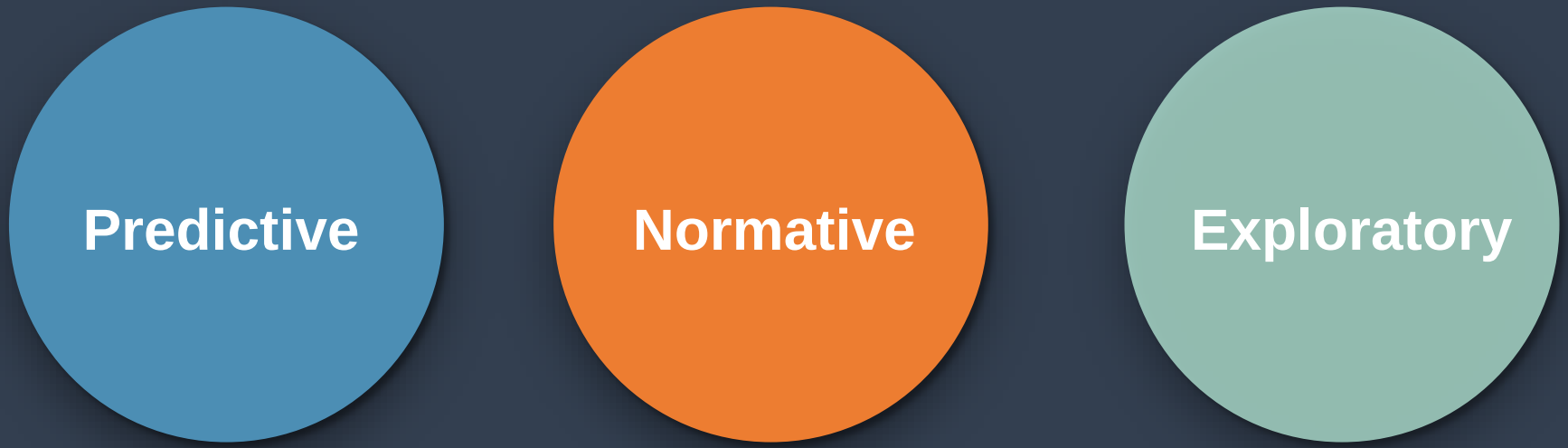
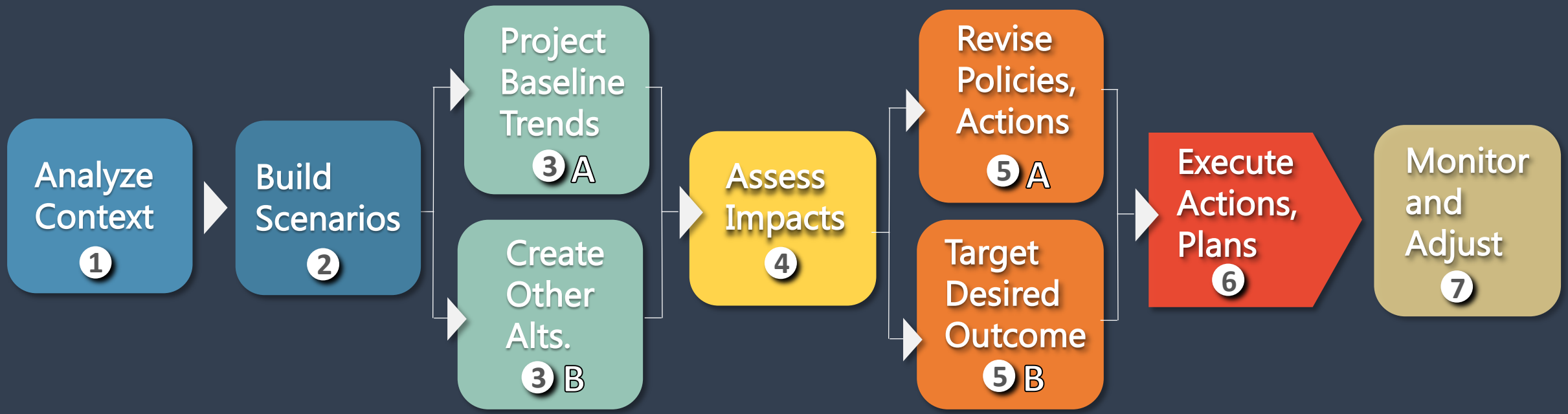
Approaches to Scenario Planning



Predictive	Normative	Exploratory
Trendline	End-State	Uncertain
Expected	Preferred	Contingent
Probable	Outbound	Inbound
Baseline	Desirable	Plausible
	Prescriptive	

https://www.fhwa.dot.gov/

Scenario Planning Steps

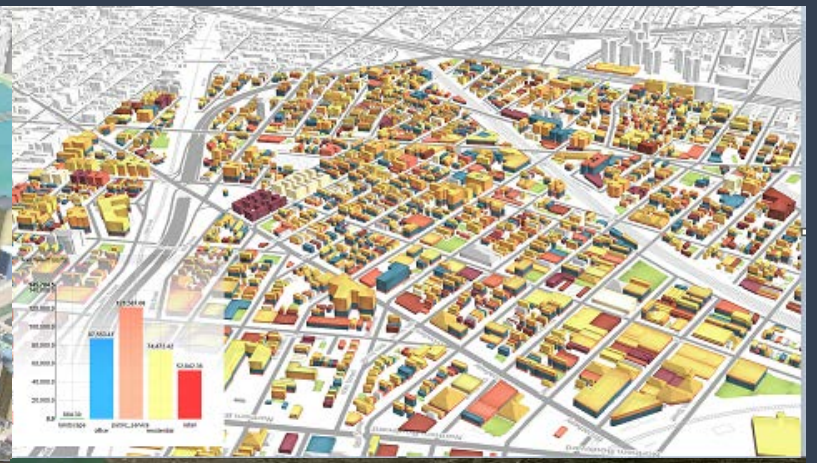


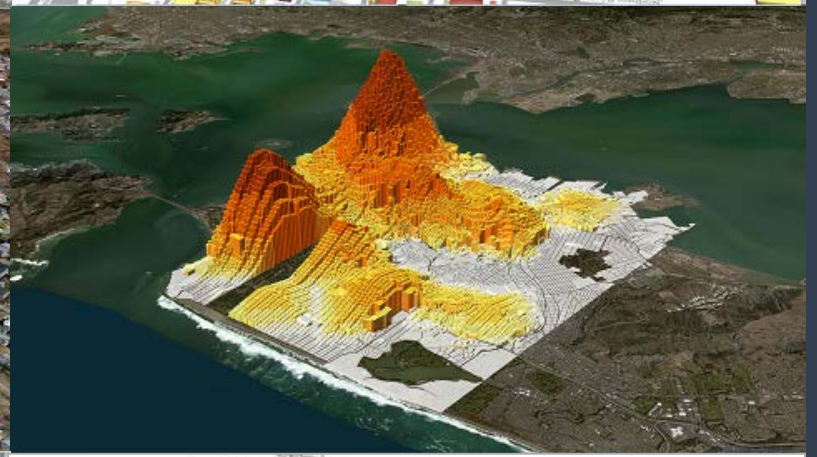
http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36(117)_FR.pdf

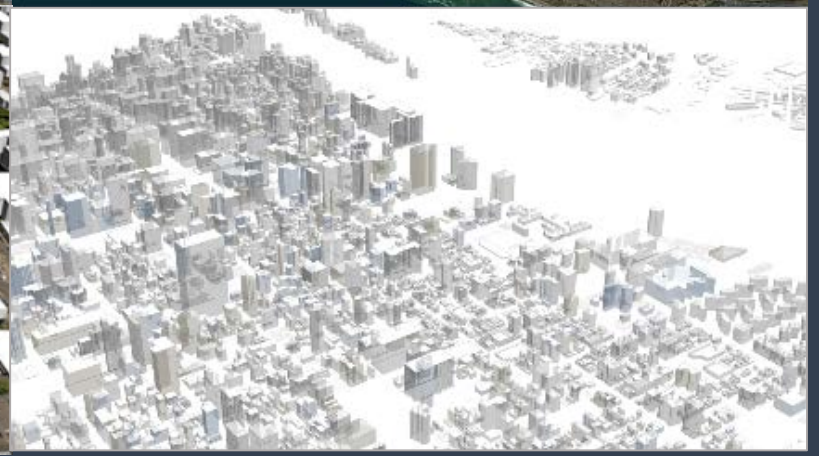
- Scenario Planning Sketch Tools

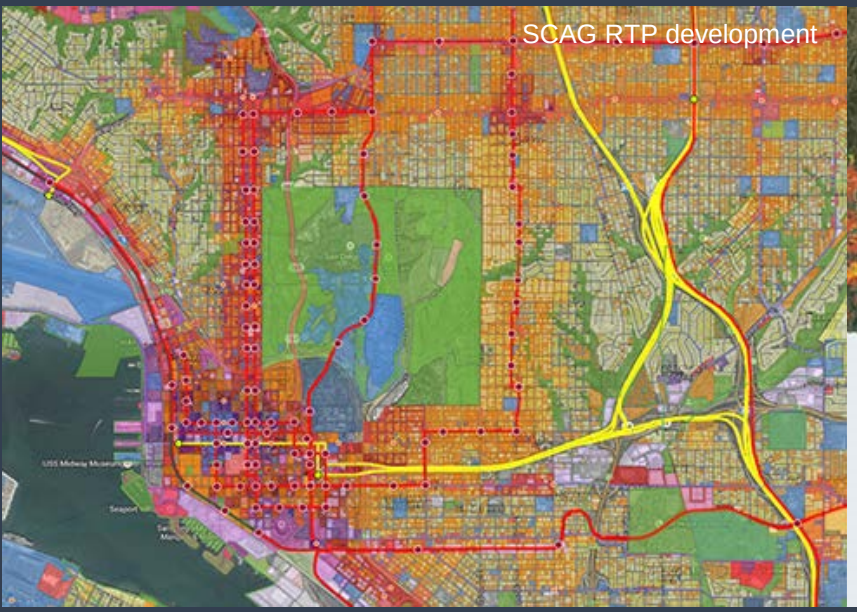
Autodesk Urban Canvas

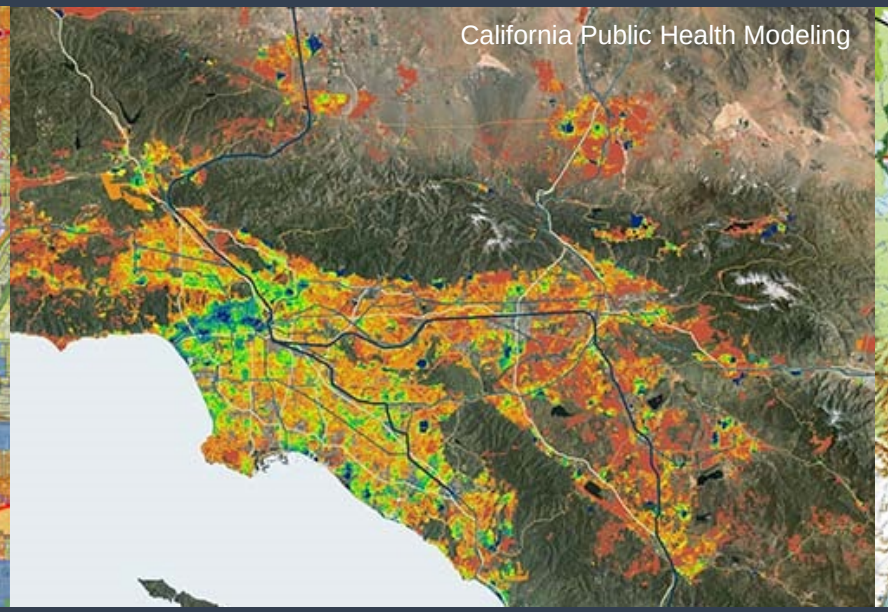
autodesk.com

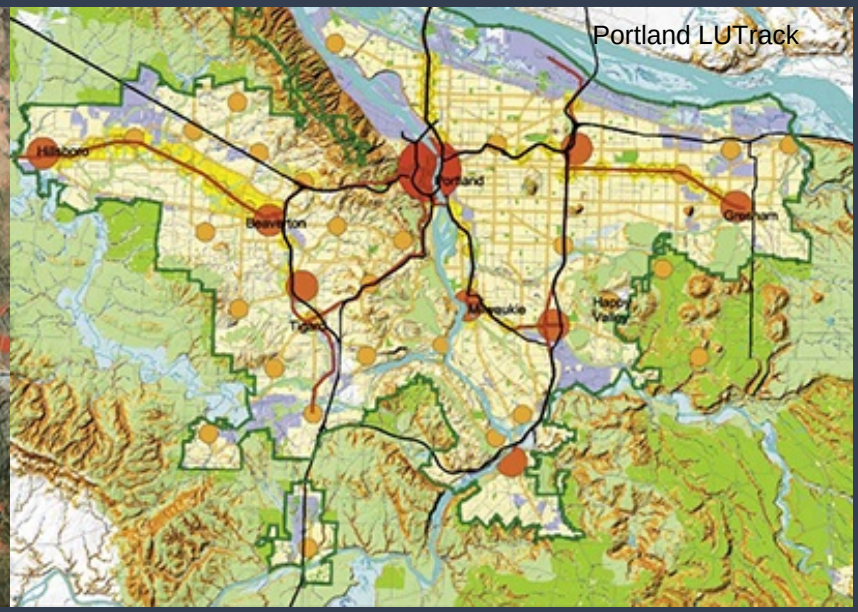






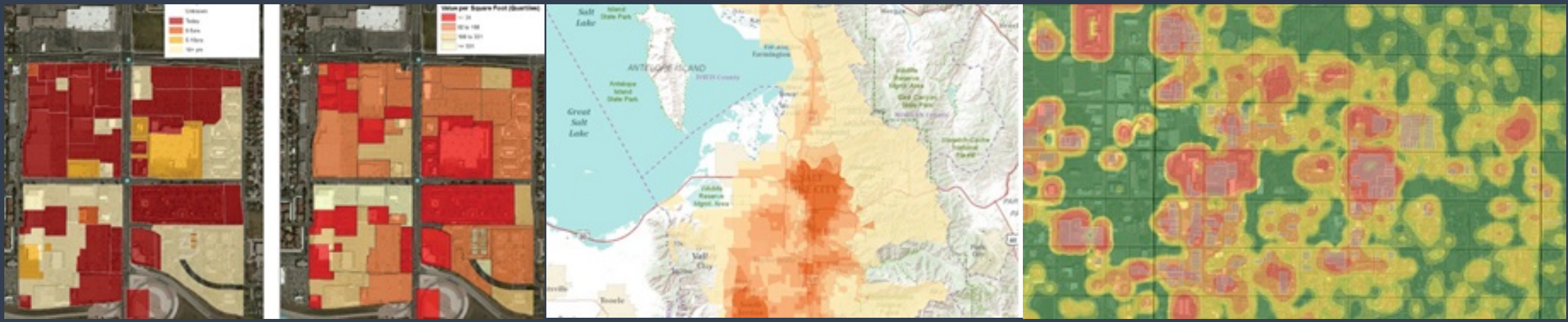






UrbanFootprint / Rapid Fire

http://www.calthorpe.com



ET+

Envision Tomorrow

http://envisiontomorrow.org/

- The Arizona experience

WhatMovesYouArizona

https://www.azdot.gov/planning/transportation-programs/state-long-range-transportation-plan

NCHRP Report 750 Series

Informing Transportation's Future

MULTIPLE FUTURES

Alone or in combination?

MOMENTUM

America gets older and more diverse. Global trade booms. Domestic growth flattens.

GLOBAL CHAOS

Worldwide financial instability leads to negative growth. Extreme weather increases its impact.

TECH TRIUMPH

New tech radically changes transportation. Economy booms and U.S. becomes more self reliant.

GENTLE FOOTPRINT

Public demands low-impact choices. Regulations reduce consumption, increase government control.

Foresight

NCHRP Report 750 Series

Informing Transportation's Future

FORESIGHT 750 SERIES

SOCIO-DEMOGRAPHICS

Model and envision the transportation impacts of shifting socio-demographics.

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Identify and assess strategies for a variety of future energy scenarios.

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How to organize DOTs for a sustainable future.

SIX REPORTS AT-A-GLANCE

FREIGHT

Explore and plan for the future of freight with a scenario planning toolkit.

CLIMATE CHANGE

How to prepare for extreme weather events.

TECHNOLOGY

Select the right technology investments at the right time.

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Six reports designed to help you find future signposts

http://www.trb.org/nchrp750/foresightreport750series.aspx

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DECISION LENS

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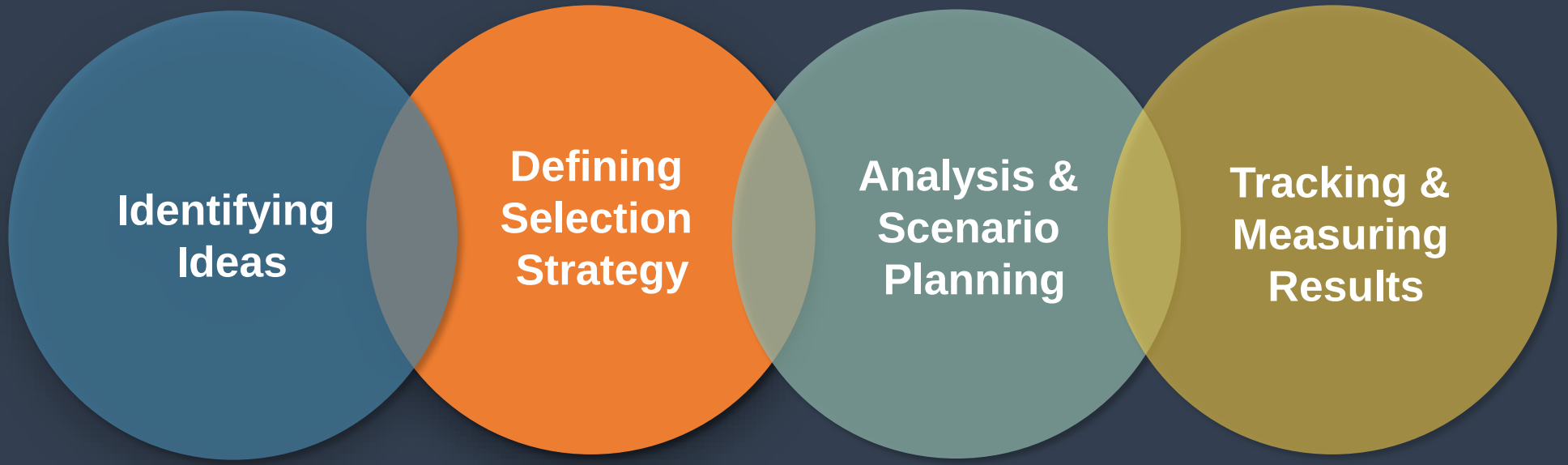

What could we do?

How should we select?

What should we do and how?

How is it working? What should we do differently

LEARN, ADAPT AND IMPROVE

DECISION LENS

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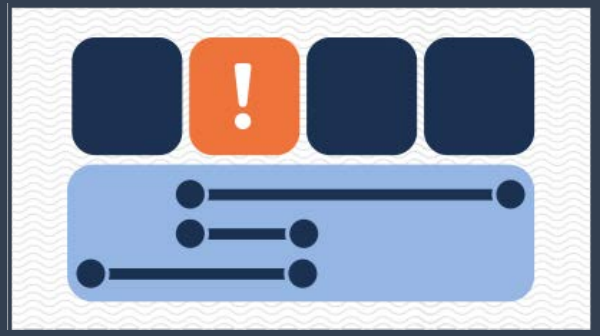
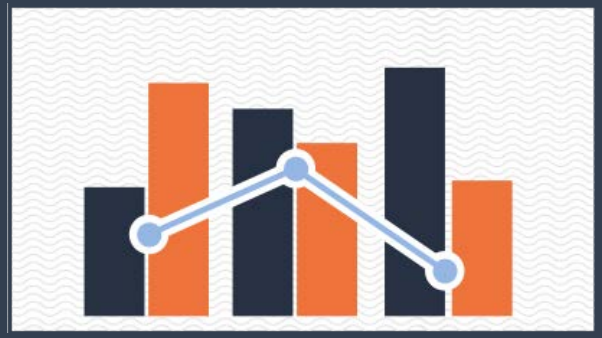
Outcome Comparison

Resource Balancing



Value Return on Investment



DECISION LENS

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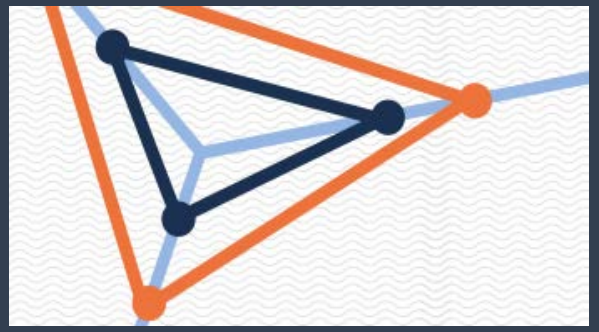
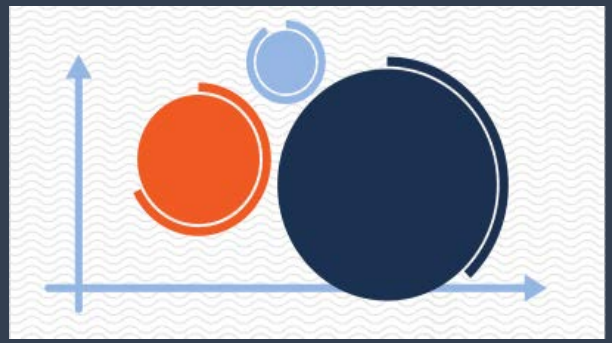
Sources of Value



What-if Analysis

Pare-to Analysis

Bubble Chart



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The Positives

- **Innovation** – ADOT is the first to use Decision Lens (or any decision science tool) to develop performance-based allocation scenarios for a long range plan
- **Success** – The tool, technology, and process generally worked as planned
- **Inclusiveness** – More than 50 staff and stakeholders directly involved in the development of RICs
- **Education** – Our staff and stakeholders learned about the challenge decision-makers face in making trade-off decisions
- **Meaningful Input** – Three consensus opinions about what the RIC should look like
- **Forecasting Mobility Improvements** – Groundbreaking work by ADOT staff to support the development of expansion performance curves

https://www.azdot.gov/planning/transportation-programs/state-long-range-transportation-plan

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The Challenges

- **Complexity** – There are a lot of moving parts to get from WMYA goals to Major Investment Categories and not everyone followed our explanation
- **Definitions** – Some confusion about what investment areas included/excluded and how cross cutting benefits (particularly safety) were incorporated into the different investment areas.
- **Bias** – A few places where noted where we may have biased results, this included the order of pairwise questions, the inability of some performance curves to consider diminishing returns
- **Weighting vs. Allocation** – struggle to understand how we got from investment area weights to an optimized allocation of resources
- **Isolating Benefits** – Investment areas such as "Technology" offer performance benefits in several areas, but we have limited ability to attribute these benefits in the current analysis framework

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The Lessons Learned

- **Targets are Key** – The thresholds for green, yellow, and red (essentially targets) had a big influence on decisions, highlight how important target setting will be.
- **Need for Simplicity** – Even technical staff struggle with understanding how the RIC is developed and what it influences – a clear and simple explanation of this is needed
- **Data vs. Policy** – People have varying opinions about what decisions could or should be answered by data vs. subjective decisions. Better definition of where this line is drawn would help.
- **Performance Forecasting** – We (and the whole DOT industry) still has a long way in developing predictive analytical capabilities in all areas outside of asset management.
- **Applicability** – Senior managers and public officials almost universally liked the scenario effort while technical staff had mixed reactions.

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