



MARC Scenario Planning Workshop

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Part 2 – Considering the Impacts

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**MARICOPA
ASSOCIATION of
GOVERNMENTS**

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)

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.

FHWA six-phase Scenario Planning Framework

1	<p>How should we get started?</p>	<p>Scope the effort and engage partners. Considerations: Process goals, objectives, budget, and stakeholder roles and responsibilities.</p>	<p>Output: Work plan.</p>
2	<p>Where are we now?</p>	<p>Establish baseline analysis. Identify factors and trends that affect the state, region, community, or study area. Considerations: Transportation and land supply, suitability, and demand; state, regional, community, or study-area trends.</p>	<p>Outputs: Transportation systems inventory, land suitability analysis, evaluation of historical trends.</p>
3	<p>Who are we and where do we want to go?</p>	<p>Establish future goals and aspirations based on values of the state, region, community, or study area. Considerations: Key values and priorities for the state, community, region, or study area.</p>	<p>Outputs: Set of working principles that document broad state, community, region, or study-area goals and preferences.</p>
4	<p>What could the future look like?</p>	<p>Create baseline and alternative scenarios. Considerations: Scenario types, analysis tools, travel demand model.</p>	<p>Outputs: Identification of appropriate scenario analysis tool or refinement of travel demand model; baseline and alternative scenarios.</p>
5	<p>What impacts will scenarios have?</p>	<p>Assess scenario impacts, influences, and effects. Considerations: Indicators to help evaluate scenario performance.</p>	<p>Outputs: Refined or calibrated analysis tool(s) or model(s) if necessary; list of indicators to compare scenario outcomes; qualitative or quantitative assessment of scenario impacts.</p>
6	<p>How will we reach our desired future?</p>	<p>Craft the comprehensive vision. Identify strategic actions and performance measures. Considerations: Stakeholder feedback on scenarios and the future blueprint; potential actions, investments, or policies to lead the state, community, region, or study area toward the comprehensive vision.</p>	<p>Outputs: Comprehensive vision; action steps; performance measures to assess progress; plan for monitoring progress.</p>

Approaches to Scenario Planning

Predictive

Trendline
Expected
Probable
Baseline

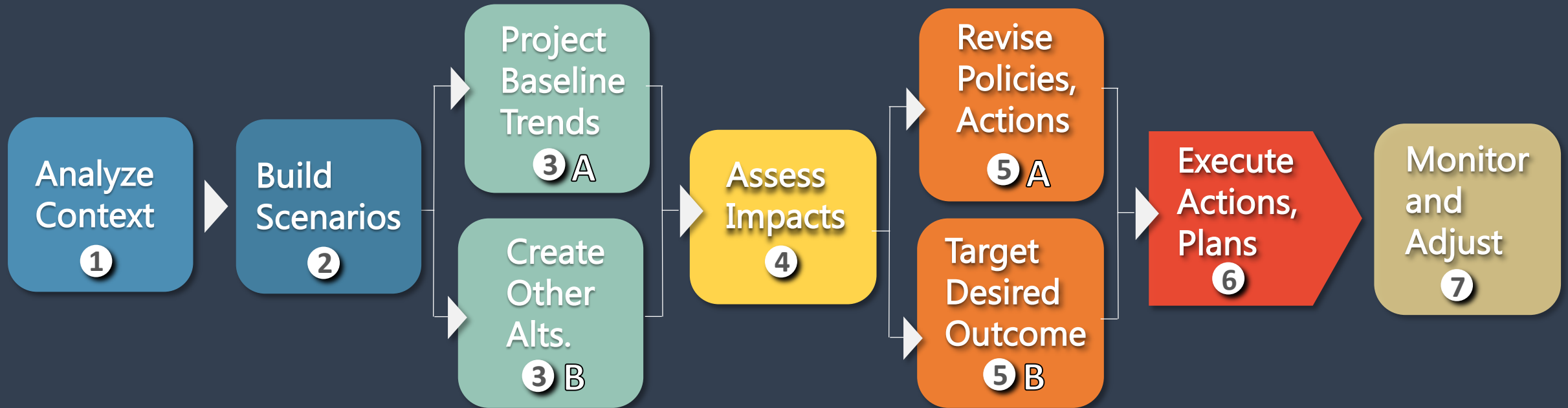
Normative

End-State
Preferred
Outbound
Desirable
Prescriptive

Exploratory

Uncertain
Contingent
Inbound
Plausible

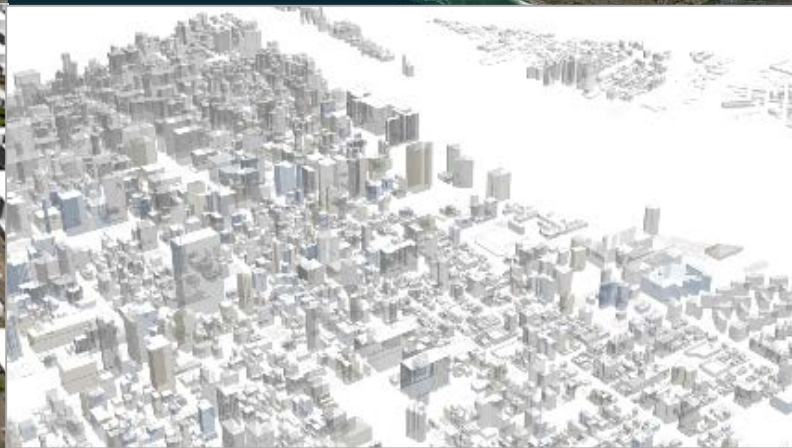
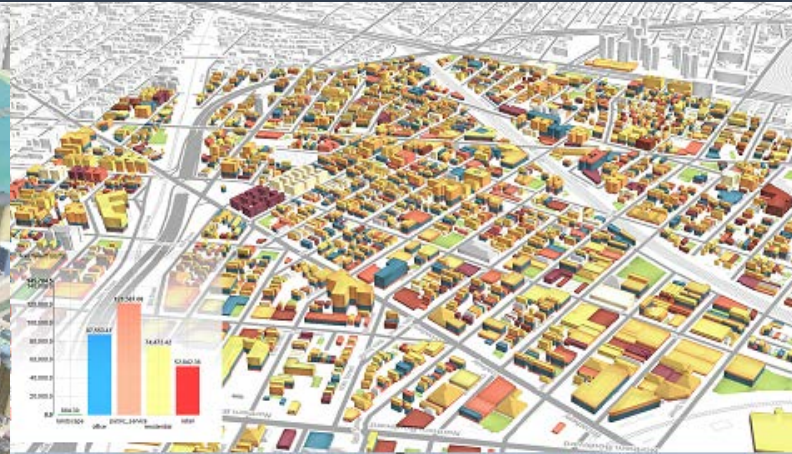
- Scenario Planning Steps

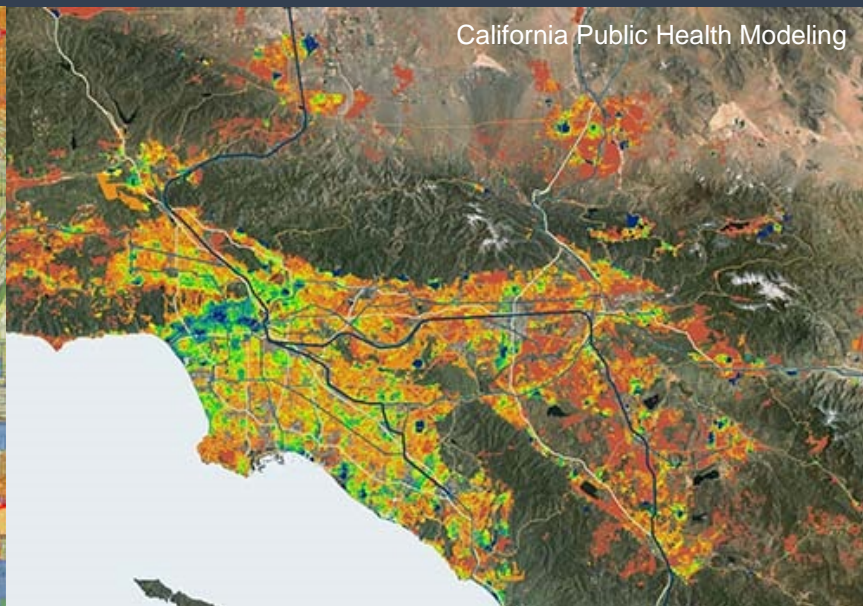
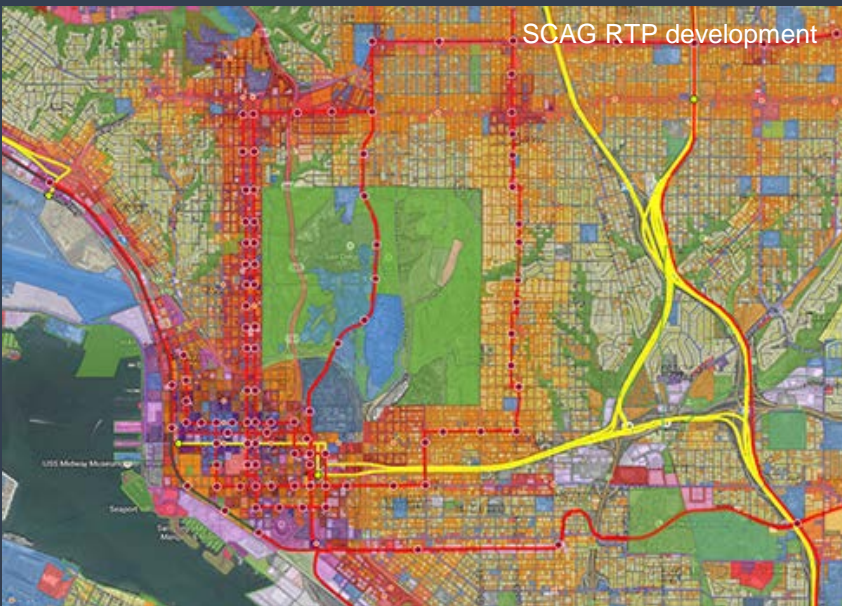


- Scenario Planning Sketch Tools

Autodesk Urban Canvas

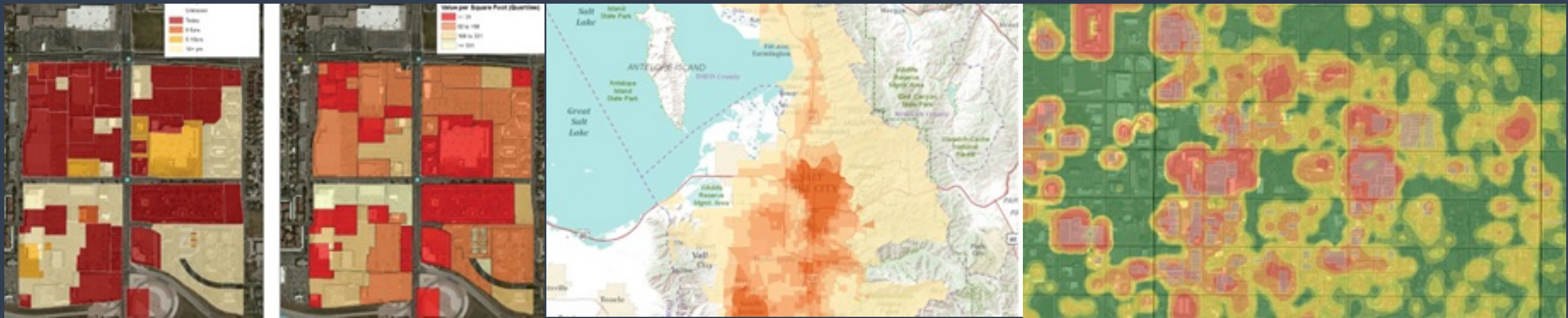
autodesk.com





UrbanFootprint / Rapid Fire

<http://www.calthorpe.com>



ET+
Envision Tomorrow

<http://envisiontomorrow.org/>

- The Arizona experience

What Moves You Arizona

Fore sight

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 750 SERIES

SOCIO-DEMOGRAPHICS

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



ENERGY & FUELS

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



SUSTAINABILITY

How to organize DOTs for a sustainable future.



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.

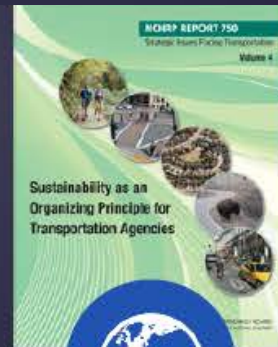
**SIX
REPORTS
AT-A-GLANCE**

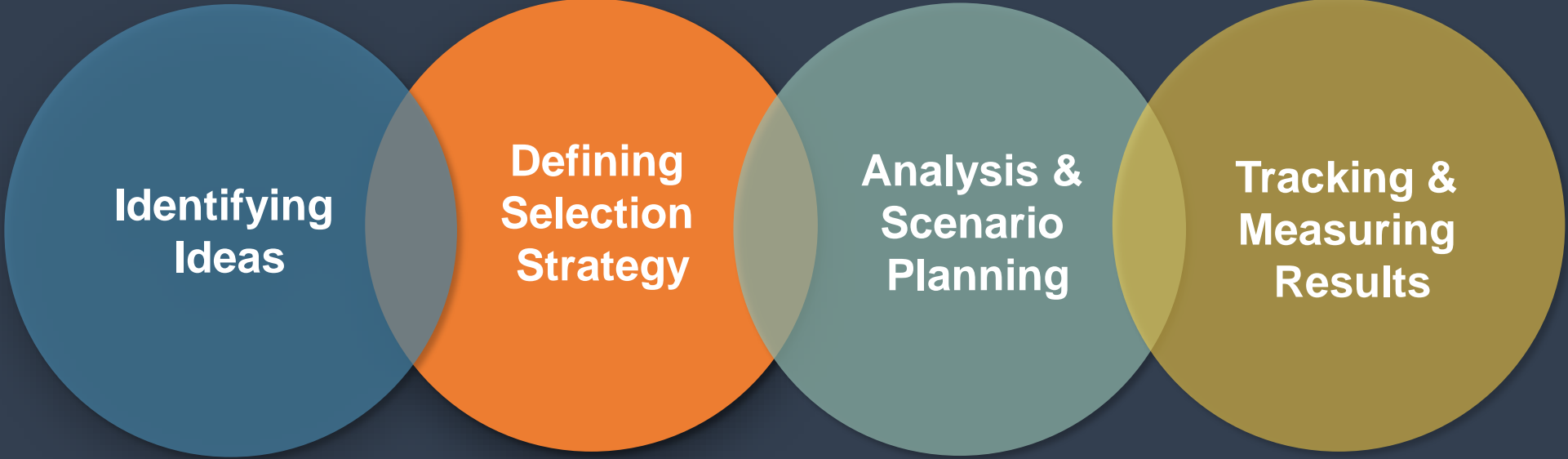


FORESIGHT 750 SERIES

Six reports designed to help you find future signposts

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





What could we do?

How should we select?

What should we do and how?

How is it working?
What should we do differently

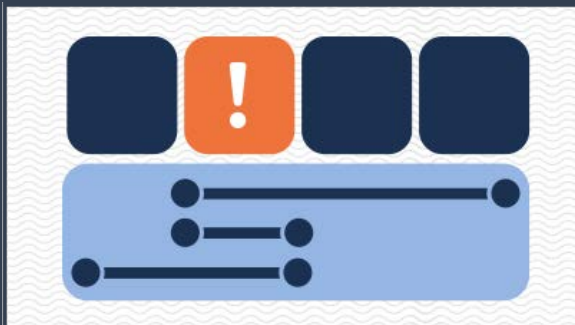


LEARN, ADAPT AND IMPROVE

Outcome Comparison



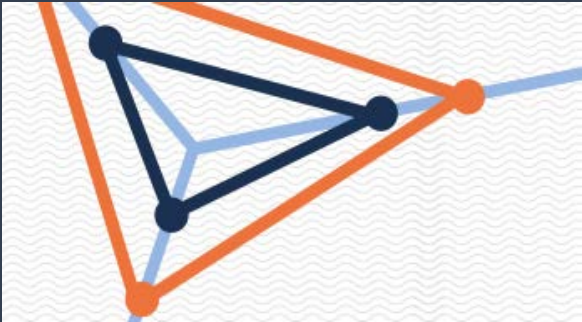
Resource Balancing



Value Return on Investment



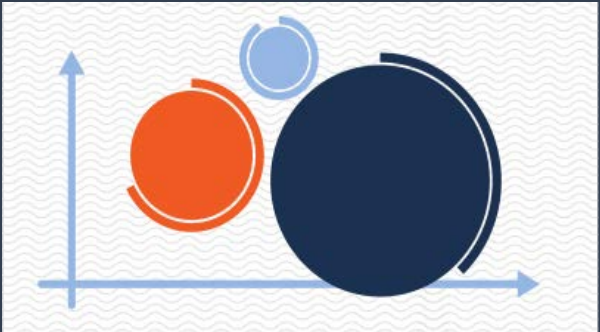
Sources of Value



What-if Analysis
Pare-to Analysis



Bubble Chart



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

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

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.

MAGni↑ude

Transportation Performance Dashboard



interactive visualization tool for regional multimodal transportation information and analysis

performance.azmag.gov

In collaboration with the Arizona Department of Transportation and Valley Metro



Regional Transportation Plan (RTP)
Project Cards



informational viewer tool for all completed and underway RTP Freeway projects and Light Rail transit projects

projectcards.azmag.gov

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