Item #

REPORT: Natural Hazard Transportation Risk Assessment

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Introduction & Vision

- The purpose of the project is to identify and assess risks and vulnerabilities to the regional transportation system. Specifically, those which have been brought on by extreme weather events and a changing climate

- MARC, in partnership with Cambridge Systematics, Hoxie Collective, and Burns & McDonnell developed a report to document progress and recommend a preferred framework for the development of a complete resilience improvement plan.

A Resilient Transportation System is…

Flexible

Users can take a different route or a different mode if one is impacted.

Responsive to all

One group is not overly burdened by climate and weather-related hazards.

Robust

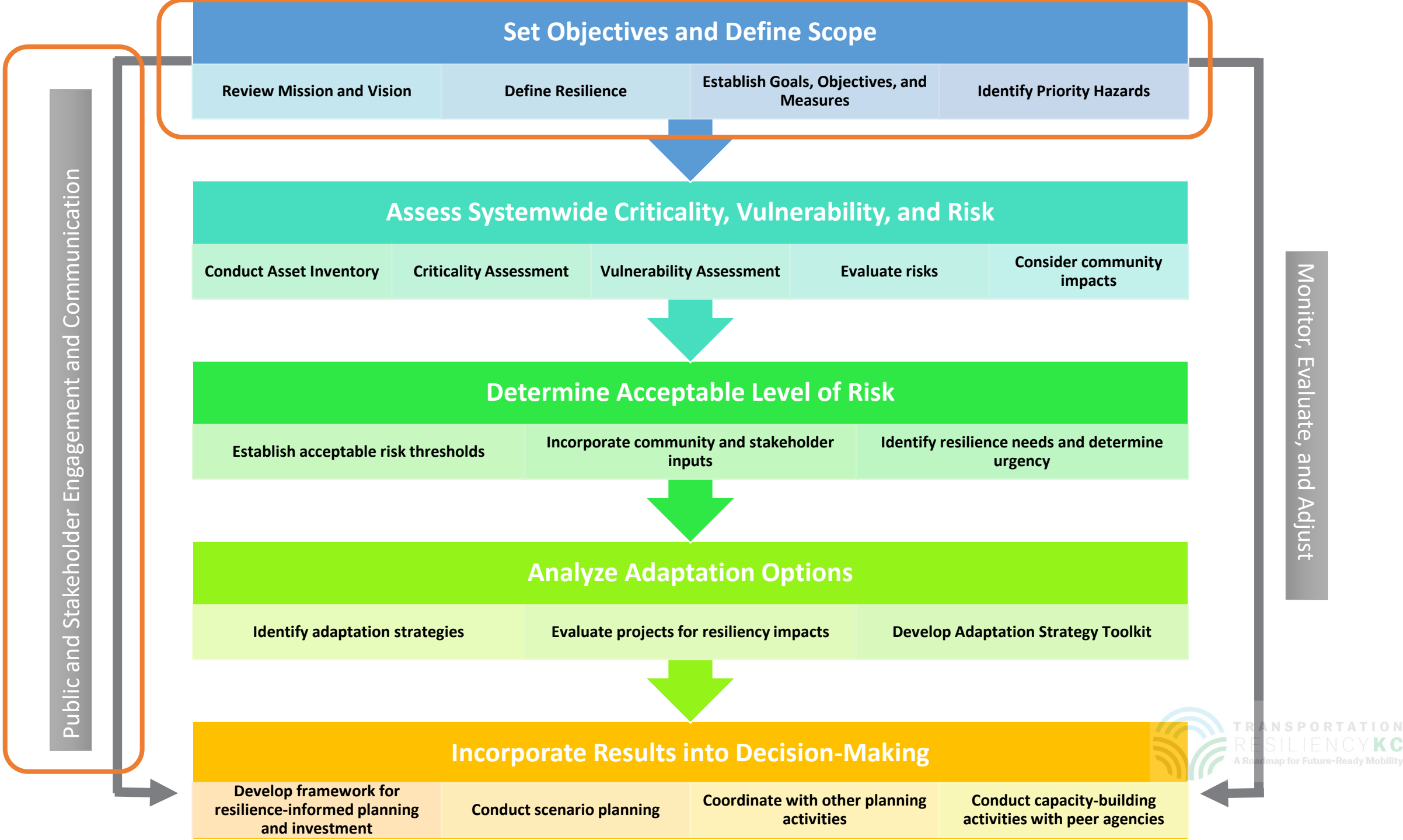
Roads, bridges, and other infrastructure are designed and maintained to resist extreme weather events and climate hazards.

Proactive

The transportation system utilizes tools and partnerships to better communicate potential transportation disruptors to help mobility rebound more quickly.

Community-Focused

Balances community scale needs with a regional vision of resilience.


Set Objectives and Define Scope
Review Mission and Vision
Define Resilience
Establish Goals, Objectives, and Measures
Identify Priority Hazards
Assess Systemwide Criticality, Vulnerability, and Risk
Conduct Asset Inventory
Criticality Assessment
Vulnerability Assessment
Evaluate risks
Consider community impacts
Determine Acceptable Level of Risk
Establish acceptable risk thresholds
Incorporate community and stakeholder inputs
Identify resilience needs and determine urgency
Analyze Adaptation Options
Identify adaptation strategies
Evaluate projects for resiliency impacts
Develop Adaptation Strategy Toolkit
Incorporate Results into Decision-Making
Develop framework for resilience-informed planning and investment
Conduct scenario planning
Coordinate with other planning activities
Conduct capacity-building activities with peer agencies
Public and Stakeholder Engagement and Communication
Monitor, Evaluate, and Adjust
TRANSPORTATION RESILIENCYKC
A Roadmap for Future-Ready Mobility

Phase 1: Summary of Planning Activities

Stakeholder & Community Engagement

PROTECT Grant Application

Factors for Criticality Determination

Next Steps

Stakeholder & Community Engagement

Steering Committee

- Meeting #1 – Nov. 5, 2024
  - Define “resilience” as it pertains to the transportation in the KC area
  - Establish goals for the regional RIP
- Meeting #2 – Apr. 21, 2025
  - Update on grant funding
  - Receive feedback on the proposed framework
  - Identify critical infrastructure

Focus Groups

- New Growth Transit
- Whole Person
- Heartstrings
- CrossLines Community Outreach + BikeWalk KC
- National Federation of the Blind – KC Chapter

Criticality Concept, Definitions

Criticality is essential step in resilience planning to ensure MARC's infrastructure investments are responsive to the needs of its population

16 T-A Pairs

Assets

Threats

	Roads	Bridges	Rail	Airports	Sidewalks	Bike Lanes	Ports	Stormwater Infrastructure
Flooding	X	X	X	X	@	@	@	@
Severe Thunderstorms	X	X	X	X	@	@	@	@
Excessive/Extreme Heat	X	X	X	X	@	@	@	@
Drought	X	X	X	X	@	@	@	@
Severe Winter Weather	@	@	@	@	@	@	@	@
Tornadoes	@	@	@	@	@	@	@	@
Windstorm/ High Wind	@	@	@	@	@	@	@	@
Lightning	@	@	@	@	@	@	@	@

Additional
48 T-A Pairs

Criticality Concept, Definitions

Risk				
	High	High Risk Low Criticality	High Risk Moderate Criticality	High Risk High Criticality
	Moderate	Moderate Risk Low Criticality	Moderate Risk Moderate Criticality	Moderate Risk High Criticality
	Low	Low Risk Low Criticality	Low Risk Moderate Criticality	Low Risk High Criticality
		Low	Moderate	High
		Criticality		

Tiering/Prioritizing – MPO in NY

TIER 1

- **Disruption will cause a regional Impact.**
- **Roads, Bridges and Bus Routes**
- **Exposure, Sensitivity, Adaptive Capacity**

TIER 2

- Disruption impact is localized and minimal
- Railroad Lines, County Trails, Other Transportation Facilities, Dams and Levees, Culverts, Stormwater Infrastructure
- Exposure Only

Essential Facilities

- Integrated into criticality score of Tier 1 assets
- Schools, Shelters, Hospitals, Fire Stations, Police Office, Emergency Response Center, Substations, Other Transportation Facilities

Tiering/Prioritizing Example – MPO in IN

Mobility and Use: Asset usage and operational importance assessed by considering the volume and type of traffic along each transportation asset.

Equity and People: Socioeconomic importance assessed by considering surrounding population and employment composition and density.

Connectivity: Considers how each transportation asset connects to other transportation options and key destinations, particularly those that contribute to a communities and residents' health and safety and means to travel along non-roadways.

Qualitative and Quantitative Assessment

Hybrid approach to how MARC can apply criticality determination in the Natural Hazard Transportation Risk Assessment

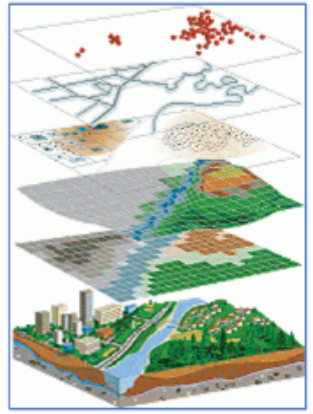
Qualitative Assessment

- Stakeholder and practitioner input.
- Persistent flooding locations
- Leveraging prior planning work (Current LRTP, hazard mitigation and local mitigation strategies)

Incorporating stakeholder input into quantitative assessment

Weighting facilities/locations based on stakeholder input

Quantitative Assessment

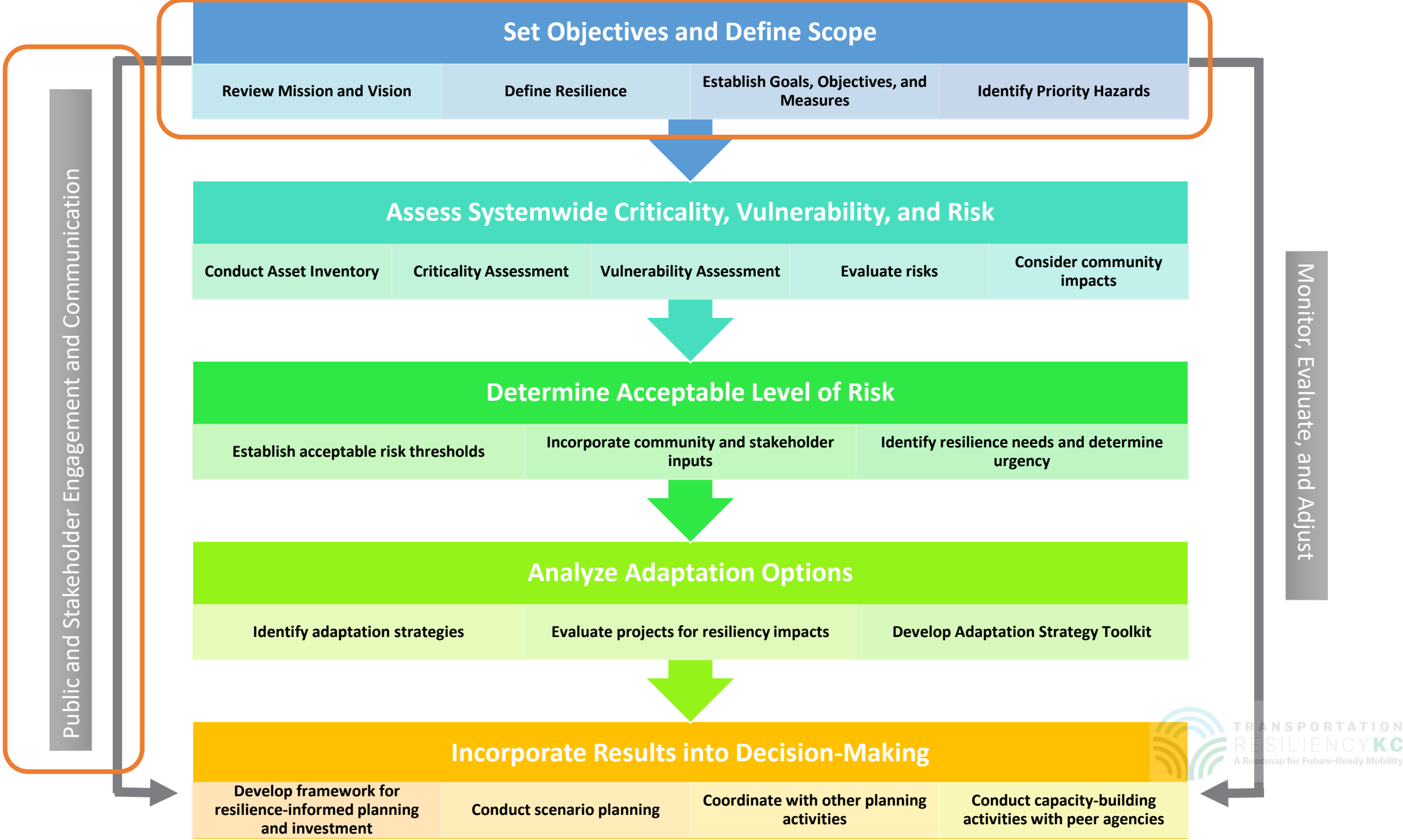


- GIS-based Quantitative Analysis
- Context Sensitive Criticality Construct (Transportation disadvantaged population, tourism, social & economic importance)
- Sensitivity, exposure level and adaptive capacity

Supporting Image Sources: Sustainable Convos, Northern Arizona Healthcare

Next Steps

- Phase II Development
- Integration into planning and project prioritization
- Develop a comprehensive resilience improvement plan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Questions?

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