



What traffic operations record already tells us about Floods

...and what it could tell us next

Ali Kothawala

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National Capital Region
Transportation Planning Board

Katherine's Pitch:

Use historical data to improve resilience project-planning and link different datasets

Regional-level economic analysis of resilience projects that:

- Uses available historic data
- Can be used to monitor and revisit objectives and scope of proposed projects

1. Climate Data

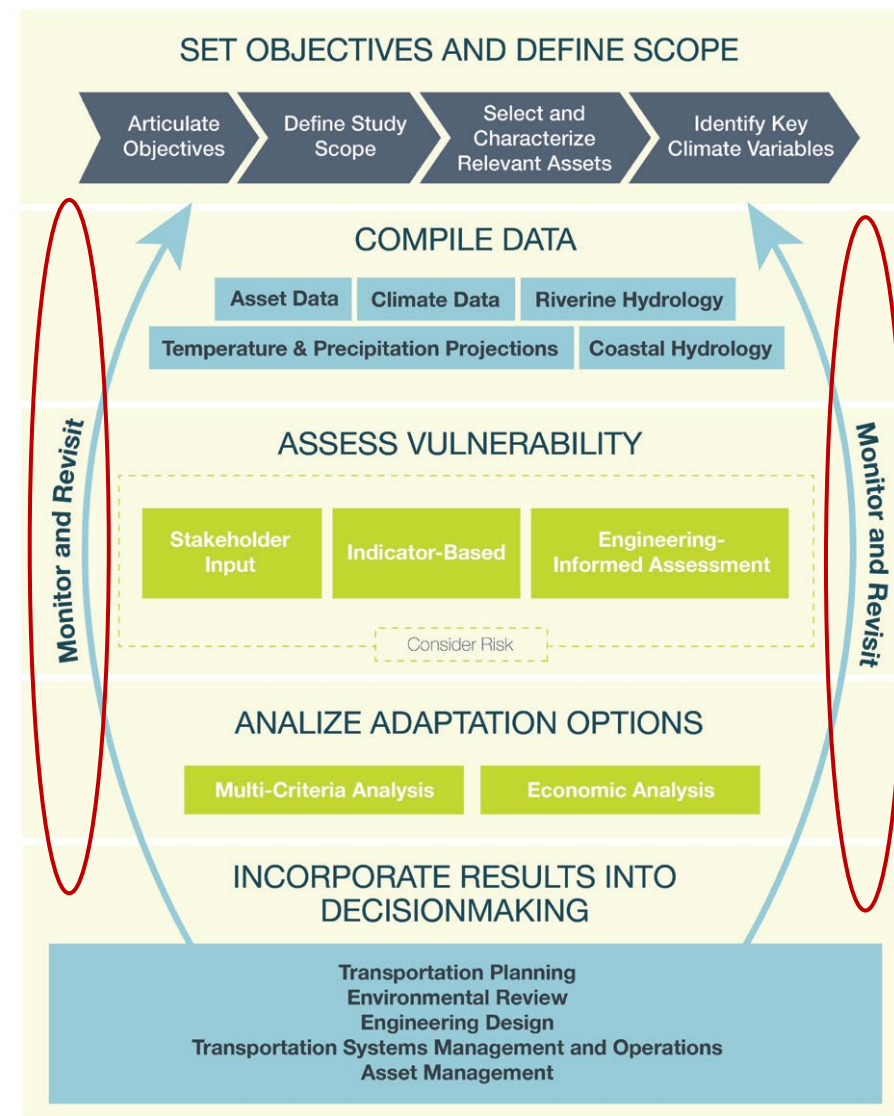
- a. Temperature & precipitation projections
- b. Historical weather - NOAA
- c. Flood-related road incidents - RITIS

2. Assess Vulnerability

- a. Flood-prone Roadways: Historically flooded + future
- b. Proposed TRIP projects: Vis-à-vis at-risk assets

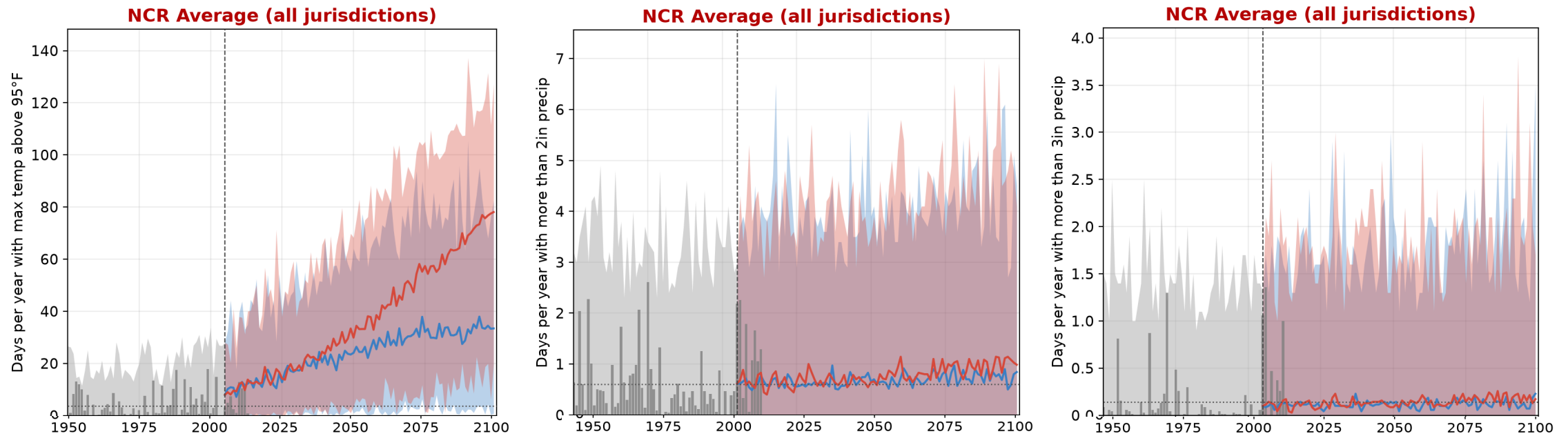
3. Economic Analysis (At-risk Assets → Human Impacts)

- a. TPB Travel Demand Model-based
 - Scenario 1: July 8, 2019 – A historic flash flood
 - Scenario 2: Major corridors flooded – Large, future flash flood
 - Scenario 3: Nor'easter scenario – Travelers stay back, advance
- b. Rerouting/delays using Incident-based Traffic Data



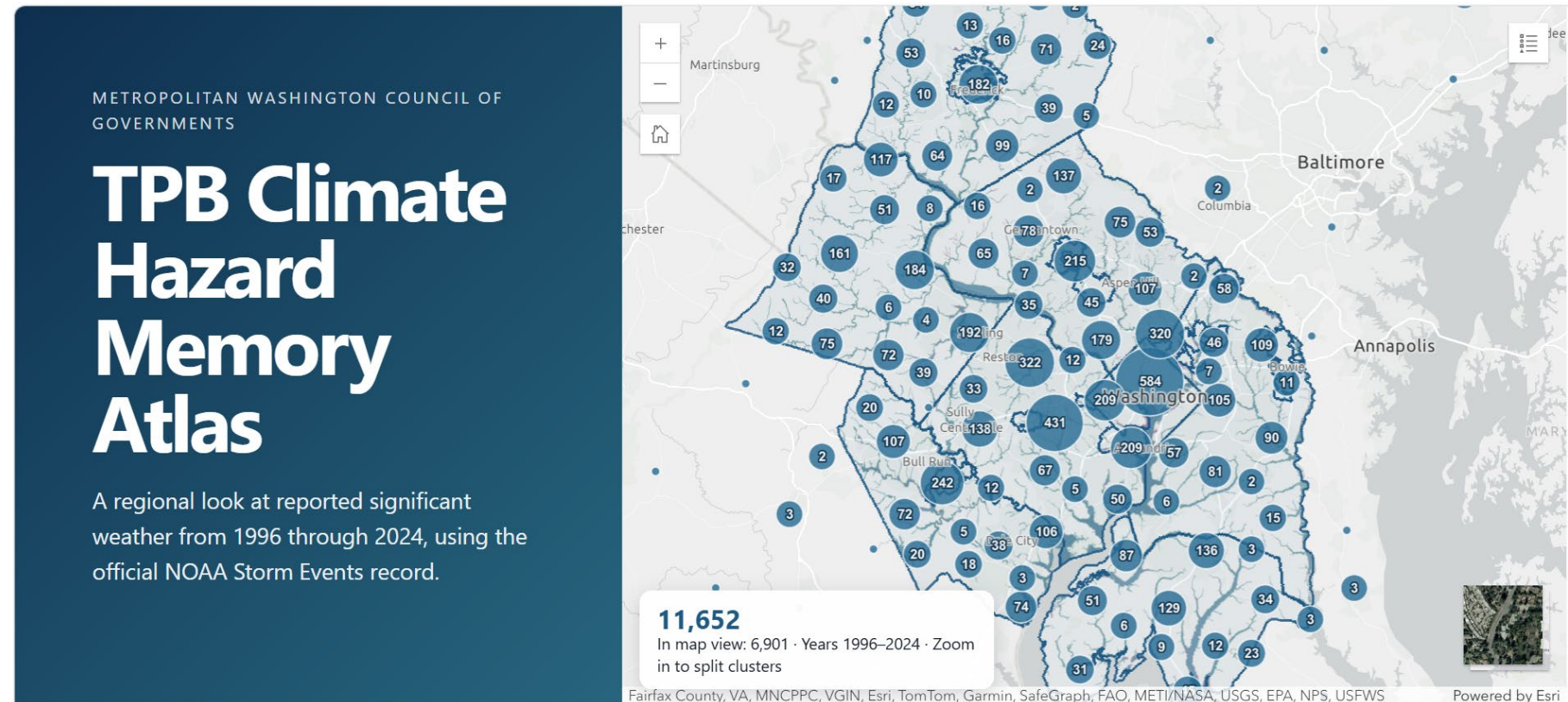
1A: Climate Projections in NCR

Heat projections are clear. Precipitation is not. So flood prioritization cannot be projection-led, and has to be grounded in what we observe.



1B: Historical Weather Events

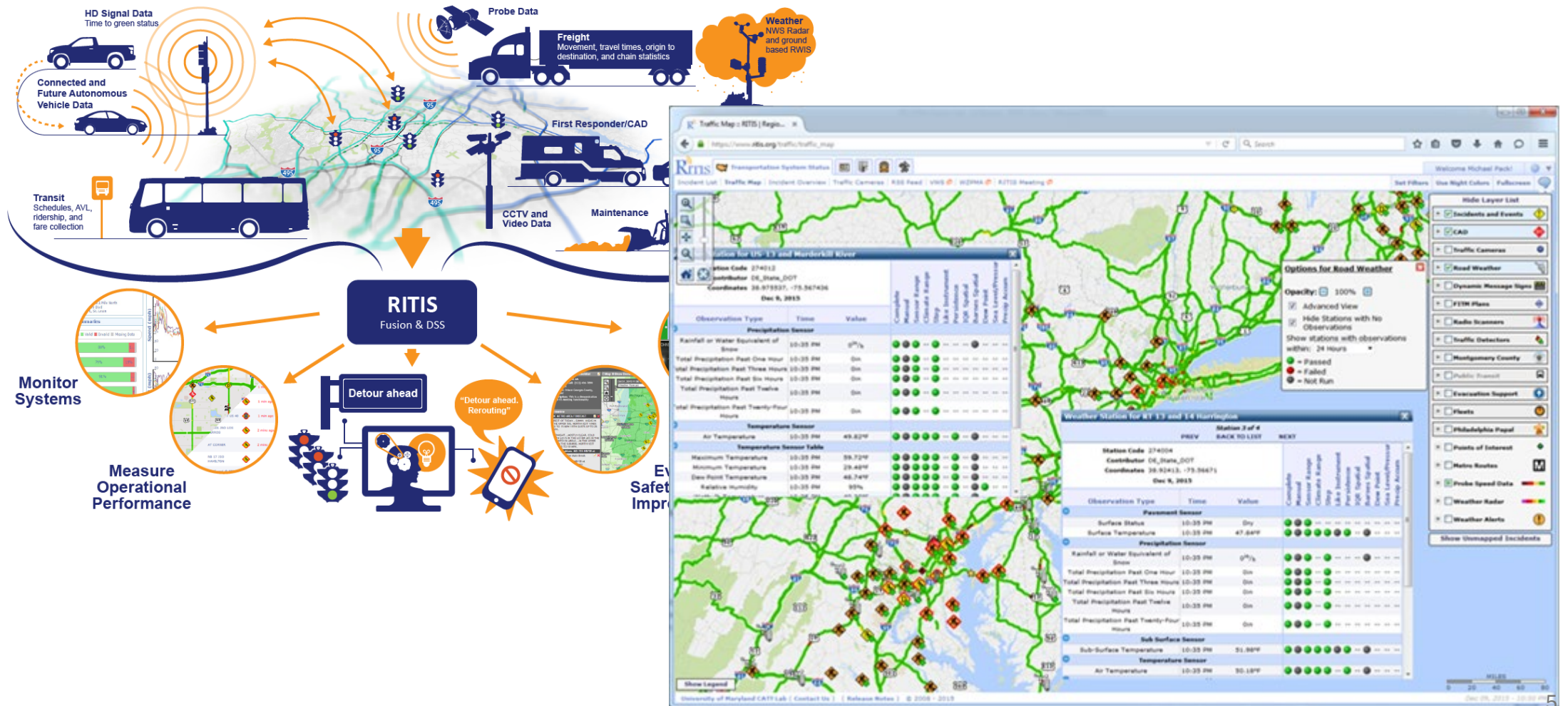
TPB Climate Hazard Memory Atlas covering extreme floods and heat



- How often has my jurisdiction been hit by a federally recorded flood or heat event, and is that changing?
- Where do I source the hazard history section of a grant application without building it myself?

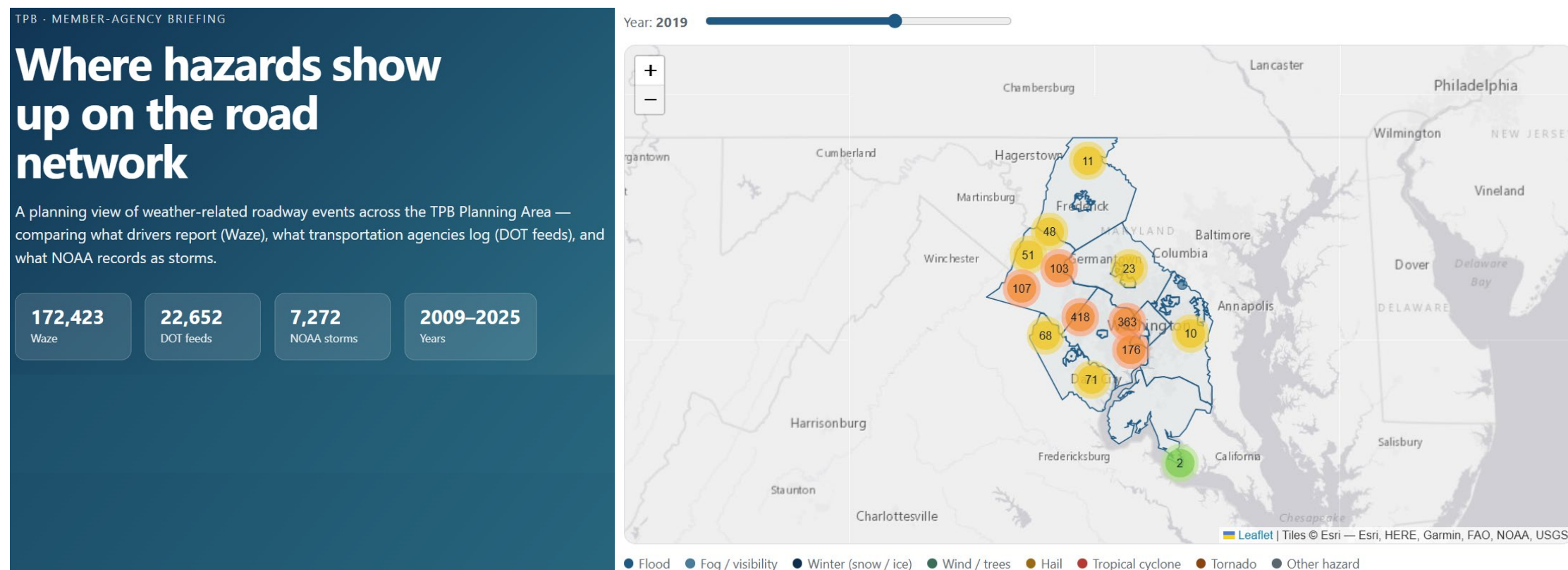
1C: Historical Weather-related Incident Records

Regional Integrated Transportation Information System (RITIS)-based Roadway Events



1C: Historical Weather-related Incident Records

Regional Integrated Transportation Information System (RITIS)-based Roadway Events



- What actually closes roads in my jurisdiction, and is it flood, winter, or wind?
- Does what my agency logs match what drivers report and what NOAA records, and where are my blind spots?

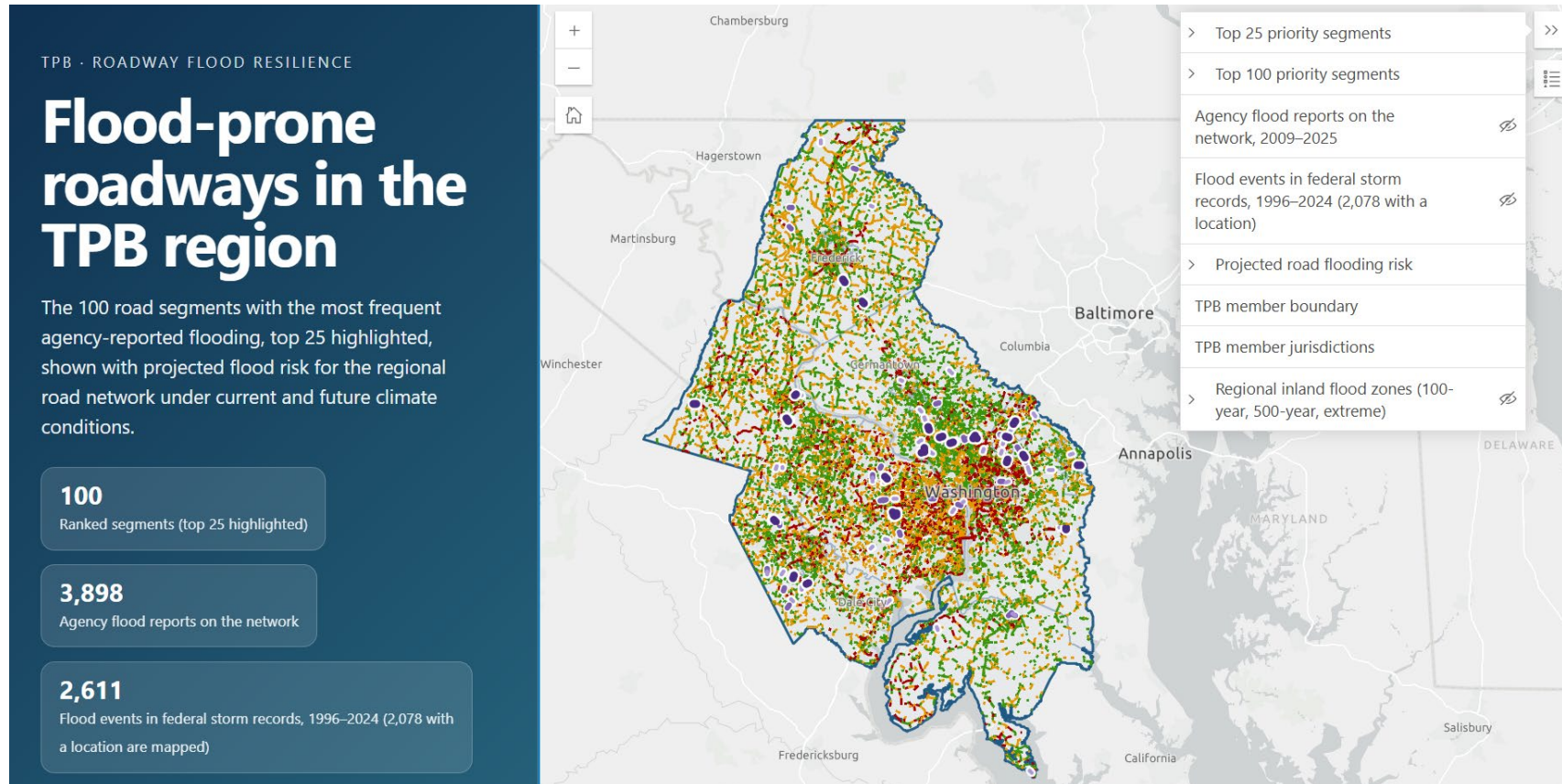
2: Vulnerability

The Fathom-based Inland Flooding Analysis takes a future perspective on flooding

We add a **historical angle** to it by incorporating highway incident records and federally reported storms and extreme heat advisories

2A: Flood-prone Roadways

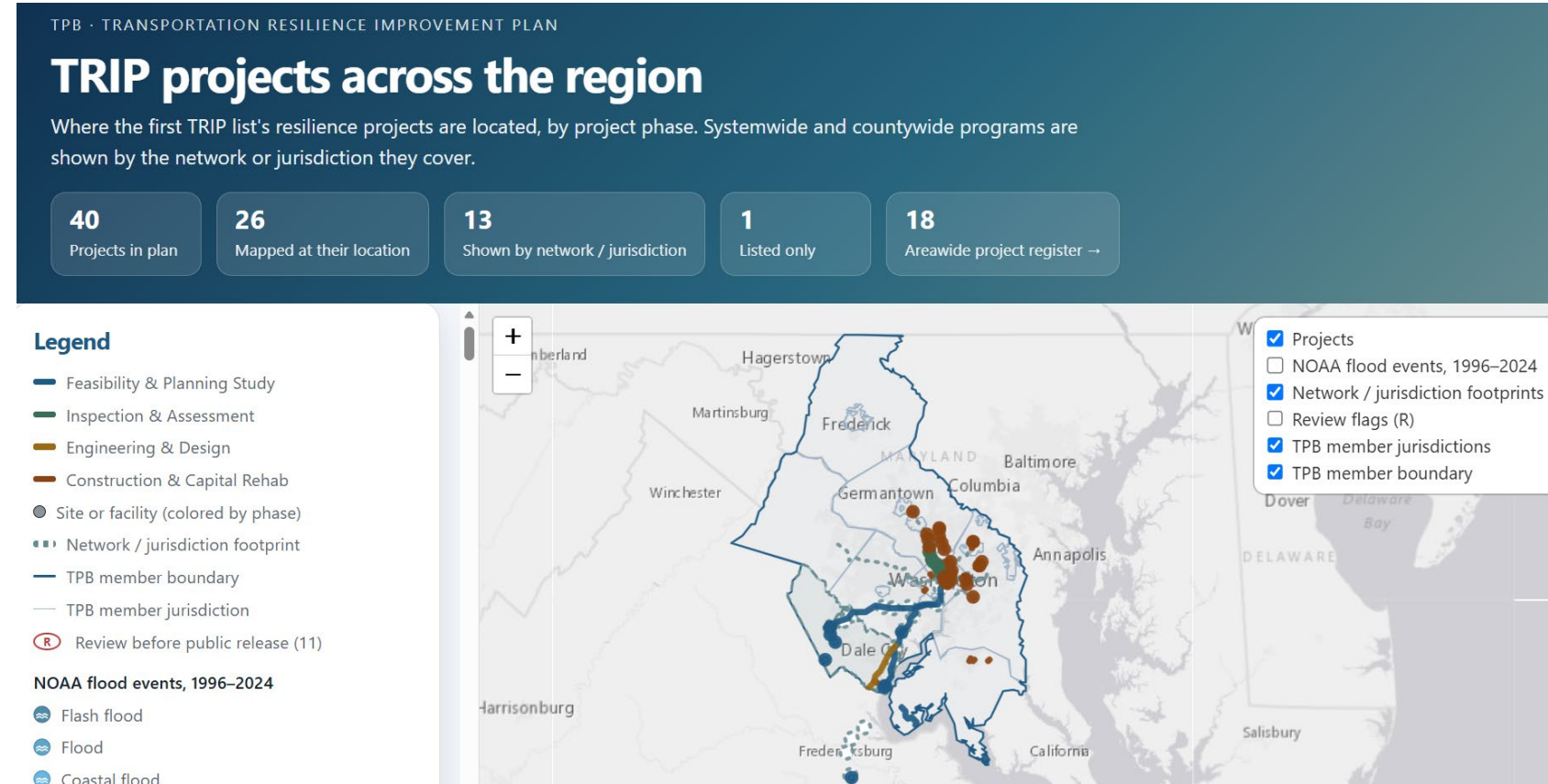
Historical flooding & projected risk, side-by-side



- Which of my segments flood most often, and does the projected risk layer agree with where they actually flood?
- Which segment is my next capital project, and what's the evidence behind that ranking?

2B: Proposed TRIP projects

Vis-à-vis weather records



- Are the resilience projects we've already programmed located where the hazard actually is?
- Which at-risk corridors have no project programmed at all?

3. Economic Analysis

From at-risk assets to quantifiable impacts on travel (delays, accessibility, economy) eventually helping with Evaluation and Prioritization

Question

Are you directly involved with calculating and reporting Benefit Cost Analyses/Ratios for FEMA BRICS and other grants?

3A: Impact on Vehicle Miles and Delays

Example modeling results

Illustrative Example

Transportation Infrastructure Closure Due to Extreme Flooding

Illustrative Example

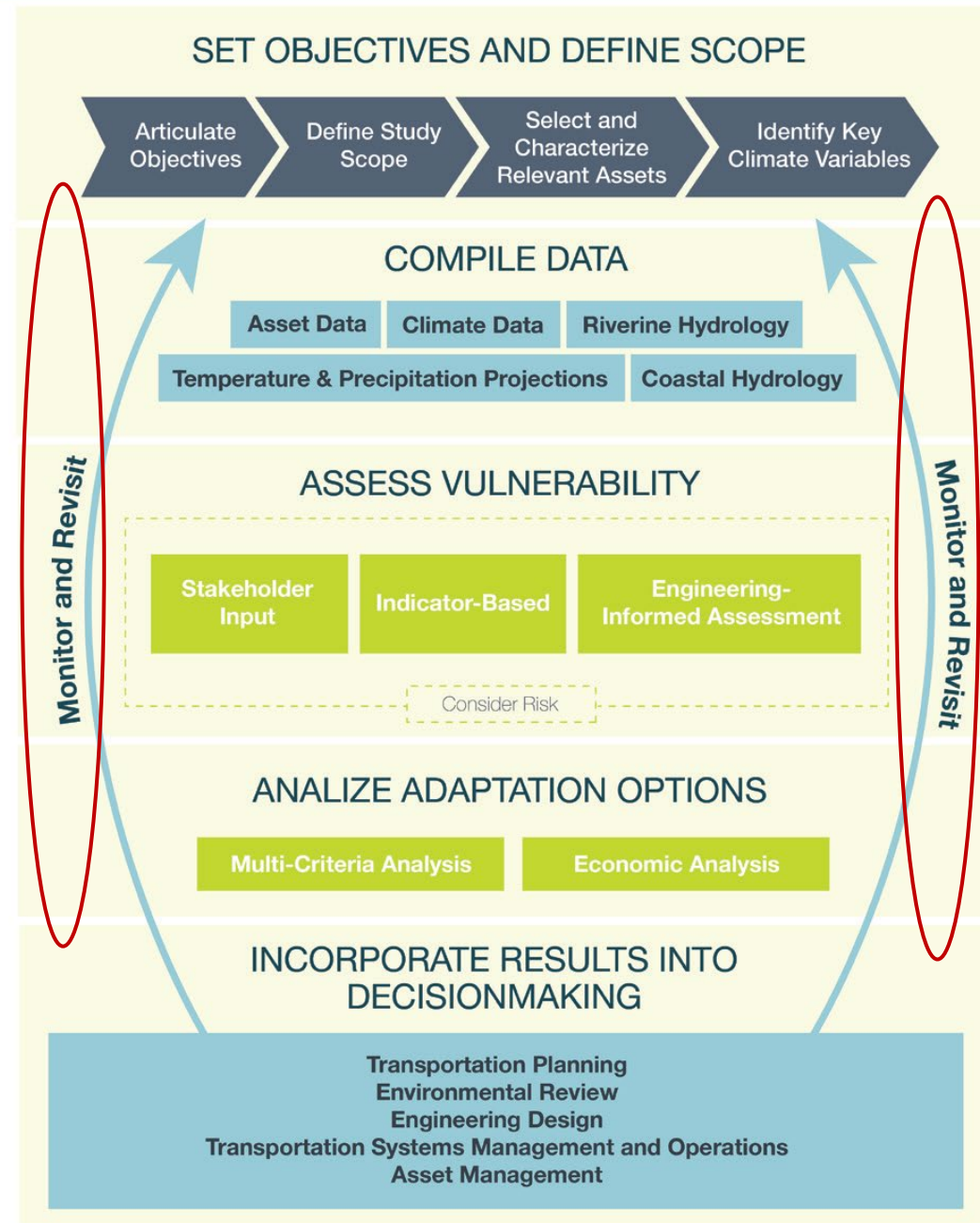
Metric	Baseline	Scenario 1	Scenario 2
Driving Levels	100	95	85
Delay	100	120	140
Transit Mode Share	100	60	45



- What happens region-wide if several corridors go down at once?
- How much does advance notice change the outcome, and is messaging worth investing in?

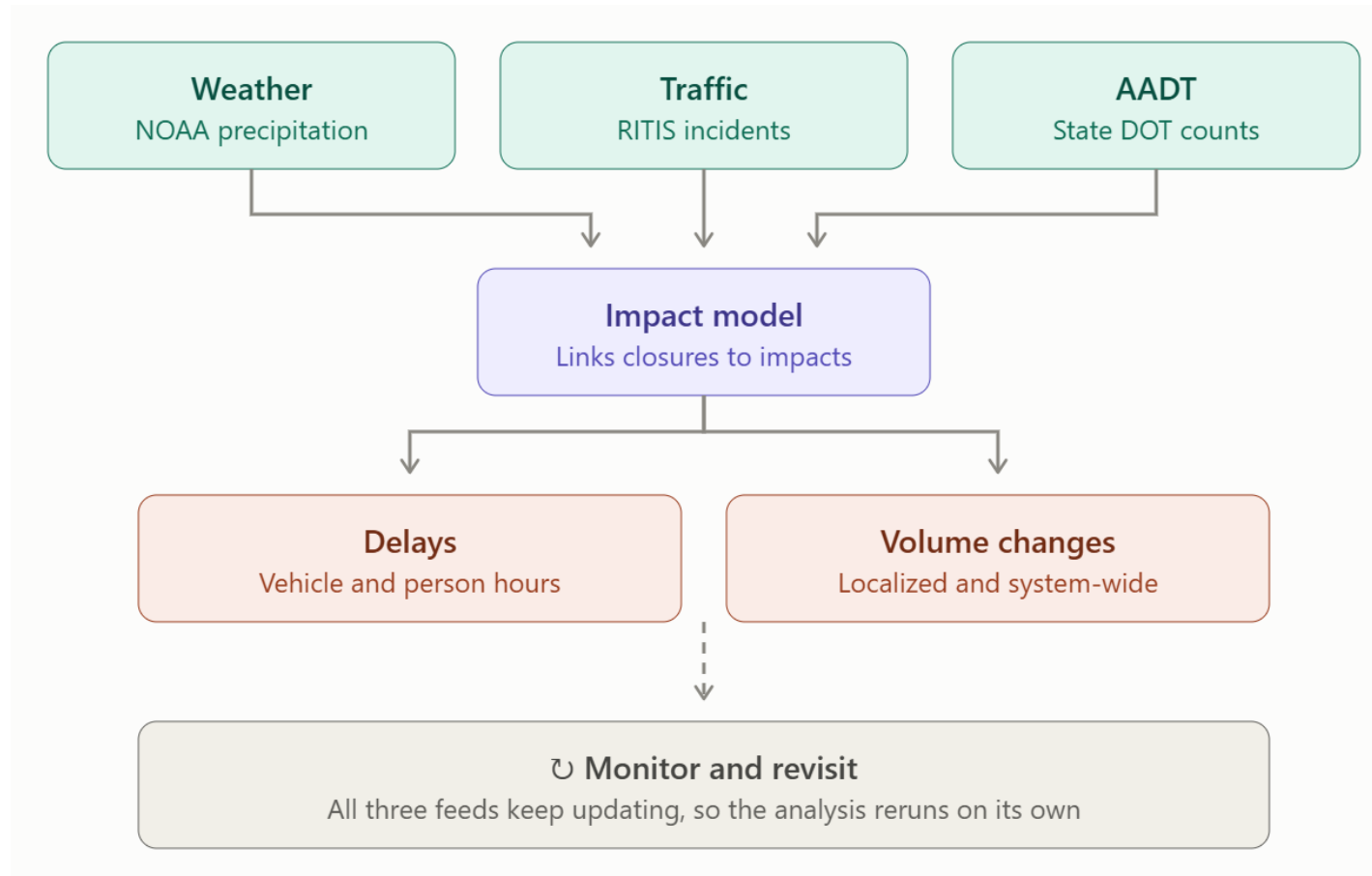
But what about the feedback loop?

- **Appraise.** What is fixing this worth? Observed frequency, duration, and AADT go straight into the BCA.
- **Evaluate.** Did the last one work? Closure frequency before and after a completed project.
- **Monitor.** Performance measures that update as the record grows.



3B: Travel Impacts using Incident Data

Monitoring and project appraisal without regularly updated data and little to no modeling
In development. Conceptual framework below*





THANK YOU!

Ali Kothawala

akothaw@gmu.edu

[Quick feedback](#)